Oral Presentation

ABDOMINAL VASCULAR DISEASE 1

OP-001

Technical and Outcome Considerations of Endovascular Treatment for Internal Iliac Artery Aneurysms

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Aim: To analyze outcomes of endovascular treatment for internal iliac artery aneurysms (IIAAs) at long-term follow up.

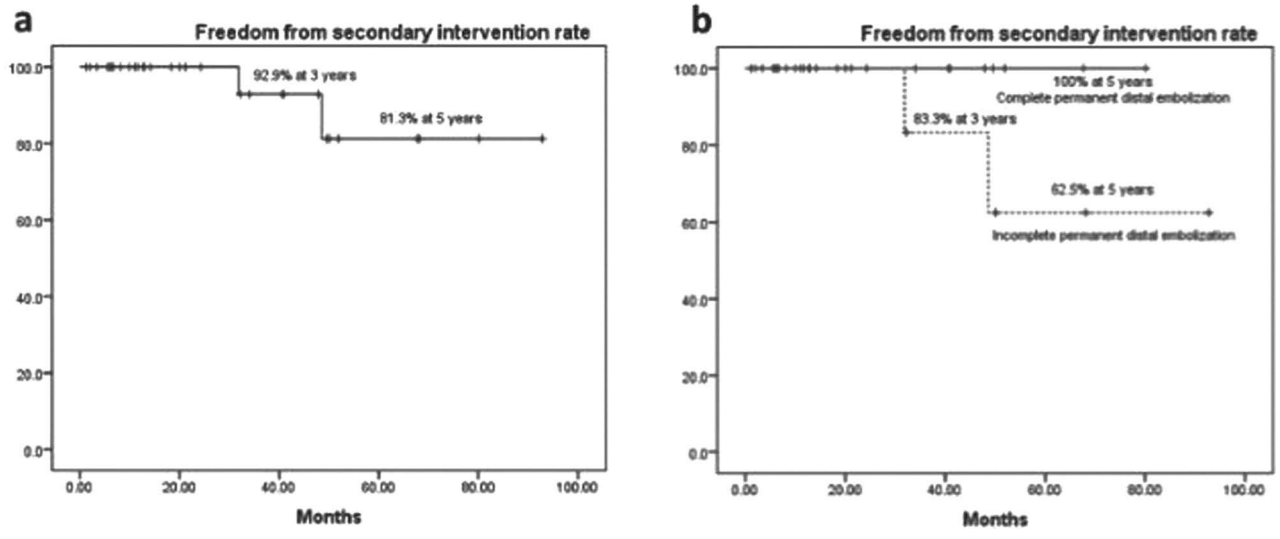
Material-Methods: We retrospectively analyzed 33 patients (28 male, mean age 77.4 years) who underwent endovascular treatment of 35 IIAAs (asymptomatic 85.7%; mean diameter 39.8 mm; 24(68.6%) inadequate proximal IIA necks (length of <15 mm and diameter of >10 mm); 6 (17.2%) occluded contralateral IIA) from 2002–2012. We attempted to perform complete selective permanent distal branches embolization (SPDE) using coils or combined with n-butyl cyanoacrylate (NBCA), followed by proximal controls either by stent-grafts (type-1) or coils (type-2). The early and long-term outcomes of both procedures and between complete and incomplete permanent distal embolization group were analyzed.

Results: Procedural success rate was 97.1% (n = 34). Complete-SPDE was achieved in 27 cases (79.4%; only with coils in 21, with coils and NBCA in 6 cases). Type-1 procedure was performed in 24 (70.6%) and type-2 in 10 (29.4%) cases. During mean follow up period of 29.1 months (range 1.2–92.8), no IIAA-related complications and mortality occurred. Pelvic ischemia occurred and resolved in 8(25%) patients. Among 32 cases followed by CT, the aneurysm diameter was stable in 18 (56.3%), shrank in 11 (34.4%), and enlarged in 3(9.4%) cases. Among 22 cases followed by contrast-enhanced CT, distal endoleak occurred in 3 (13.6%) cases and 2 required secondary interventions (2/32, 6.3%). Type 1 procedure tends to have lower rates of endoleak (1/17; 5.9%), enlarged aneurysm sac (2/24; 8.3%) and secondary intervention (1/24; 4.2%). The enlarged and secondary intervention cases were only found in the incomplete-SPDE group, with significant correlation (p = 0.007 and p = 0.042, respectively). The 5-years overall secondary intervention-free rate was 81.3% (100% and 62.5%% in the complete and incomplete-SPDE group, respectively, p = 0.128).

Conclusion: Endovascular treatment for IIAAs is feasible and safe. Complete-SPDE is important to achieve satisfactory long-term outcomes.

Keywords: endovascular treatment, internal iliac artery aneurysm, complete permanent embolization, long term outcomes

Secondary intervention-free rate



(a) Overall rate of freedom from secondary intervention; (b) Comparison between complete and incomplete distal embolization group

Outcomes Comparison

Outcomes	Complete vs. incomplete distal embolization	P	Type 1 vs. Type 2 procedure	P
Pelvic ischemia	7/25 (28%) vs. 1/7 (14.3%)	.646	7/24 (29.2%) vs. 1/8 (12.5%)	.642
Sac changes	15/25 (60%) vs. 3/7 (42.9%)	.669	14/24 (58.3%) vs. 4/8 (50%)	.703
– Stable	10/25 (40%) vs. 1/7 (14.3%)	.374	8/24 (33.3%) vs. 3/8 (37.5%)	1.00
– Shrank	0/25 (0%) vs. 3/7 (42.9%)	.007*	2/24 (8.3%) vs. 1/8 (12.5%)	1.00
–Enlarge				
Endoleak	1/17 (5.9%) vs. 2/5 (40%)	.117	1/17 (5.9%) vs. 2/5 (40%)	.117
Secondary intervention	0/25 (0%) vs. 2/7 (28.6%)	.042*	1/24 (4.2%) vs. 1/8 (12.5%)	.444

OP-002

Primary Mycotic Aortic Aneurysms, Open or Endovascular Repair— A Single Center Ten-Year Experience

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Purpose: We report our single-center experience of open and endovascular repair of mycotic aortic aneurysms (PMAA), and the early and midterm outcome.

Methods: Twelve cases of PMAA from September 2001 to December 2010 were retrospectively reviewed. The mean age was 72.9 years (range 59 to 83 years), and ten patients were male. The aneurysms were located in abdominal aorta in ten cases, and in thoracic aorta in two cases. Three cases underwent primary open surgery with extensive debridement and extra-anatomical bypass, and nine cases underwent primary endovascular aneurysm repair. Preoperative signs of infection, such as leukocytosis or elevated C-reactive protein, were found in all of the patients, and fever was apparent in 58.3% (7/12). At the time of operation, 83.3% (10/12) of mycotic aneurysms were already ruptured or got contained rupture.

Results: Positive microbial cultures were sought in eight patients including Salmonella species in 2, Staphylococcus aureus in 3, Escherichia coli in 1 and Streptococcus in 1. Mean follow-up time was 29.9 months (range 1 to 98 months). Five patients took lifelong oral antibiotics after discharge with a mean medication duration of 17 months (range 1 to 65 months). In the open surgery group, the early and late mortality rate was 1/3 and 2/3 respectively. In the EVAR group, there was no early mortality but the late relapse rate was 66.7% (6/9). The five relapsed patients had to undergo either secondary open debridement surgery or CT- guided drainage and antibiotic flush or expired. The late mortality rate in this group was 44.4% (4/9).

Conclusion: EVAR is a reasonable short-term management to treat patients with hemodynamic instability or high surgical risk. However, the late relapse rate after EVAR was very high in this series, despite the adjunctive drainage, flush and aggressive antibiotic treatment.

Keywords: abdominal aorta aneurysm, mycotic, surgical, stent

OP-003

Clinical Outcomes After Internal Iliac Artery Embolization Prior to Endovascular Aortic Aneurysm Repair

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Introduction: The success of endovascular aortic aneurysm repair (EVAR) is highly dependent on the anatomical features of the aneurysm. In order to prevent type II endoleaks from the internal iliac artery (IIA), embolization of one or both IIAs may be required.

Methods: We performed a retrospective study of a prospectively gathered database of 100 patients who underwent EVAR at our institution. The case notes were examined and patients were interviewed by telephone and specifically asked about symptoms of pelvic ischemia since undergoing EVAR.

Results: We identified 42 (42%) patients who had undergone coil embolization of one or both IIAs in preparation for EVAR. The mean time from surgery to follow-up by telephone interview was 21.5 months. Buttock claudication occurred in 10 (26%) of 38 patients. Sexual dysfunction occurred in 13 (36%) of 36 patients. Age was associated with buttock claudication and sexual dysfunction.

Conclusion: Based on our experience, IIA embolization prior to EVAR is not a benign procedure. It can lead to numerous effects of pelvic ischemia such as buttock claudication and sexual dysfunction. It is necessary to preserve both IIA if possible in especially young patients.

Keywords: endovascular aortic aneurysm repair, internal iliac artery, embolization, endoleak

OP-004

Acute Superior Mesenteric Artery Embolization: A Better Outcome Achieved Through Improved Imaging Techniques and a Changed Policy of Clinical Management

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Objective: Despite surgical advance, there is no major improvement for the outcome of Acute superior mesenteric artery (SMA) embolization. We recently changed our policy of clinical management from passive treatment to active surgical intervention. Present study was aimed to analyse and compare the results obtained from acute SMA embolization patients before and after the change.

Materials-Methods: We retrospectively reviewed 21 patients treated for acute MV Tadmitted in our hospital between 2002 and 2012. Before 2007 (Group I), our policy was to perform conservative therapy including peripheral anticoagulation and thrombolysis in patients with suspected acute SMA occlusion while with close observation; when intestinal necrosis was suspected, laparotomy was carried out. After 2007 (Group II), we changed our policy to active laparotomy and mechanical thrombectomy with Fogarty catheter. Each patient in this study was assessed for diagnosis, initial management (operative or non-operative), mortality, duration of hospitalisation, and outcome.

Results: There were 11 in Group I, 10 in Group II. The mean duration of diagnoses made after admission was 2.3 days for patients in Group I, and 1.5 days for those in Group II (p, 0.01, Student's t-test). Nine patients underwent passive laparotomy due to suspected intestinal neceosis and two patients received non-operative treatment initially in group I, the mortality was 73%; while nine patients underwent active operations with mechanical thrombectomy and one patients received non-operative management in group II, the mortality was 18% ($p < 0.05$). There is a significant difference in 2-year survival rate between the two groups.

Conclusion: Recent improvements in imaging techniques have led to a dramatic change in the principle and policy of clinical management for acute SMA embolization, which leads to a more favourable outcome of the disease.

Keywords: mesenteric artery, emboliaztion

OP-005

Allograft Replacement for Infrarenal Aortic Graft Infection

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Objective: Aortic reconstructions for primary graft infection, mycotic aneurysm, and aortic graft-enteric erosion bear high morbidity and mortality rates. Cryopreserved grafts have been implanted successfully infected fields and may be suitable for abdominal aortic reconstructions.

Methods: Between November 1999 and February 2007, 19 patients, with a mean age of 71,2 years had *in situ* aortic replacement with Cryopreserved Aortic Allograft. Indications for CAA placement were primary graft infection in 15 patients (78,9%), mycotic aneurysm 1 (5,3%), aortoenteric fistulas 2 (10,5%), endoprostesis infection 1 (5,3%). Infectious organisms were identified in 16 patients (84,2%); the most frequent organism was Staphylococcus aureus in 6 (31,6%).

Results: Early postoperative mortality was 36,8% (7 patients), including 3 (15,79%) allograft-related deaths from rupture of the allograft. Four deaths were not allograft related. Significant risk factors for early mortality were septic shock, emergency operation, emergency allograft replacement, surgical complication or medical complication, and need for repeat operation. There were 6 (31,58%) non lethal allograft complications (rupture, n = 2; thromboses, which were successfully treated at repeat operation, n = 4; and amputation, n = 1). Four patients (21,05%) were lost to follow-up. Mean follow-up was 24 months. Late mortality was 10,53% (2 patients). Actuarial survival was 52,63% at 1 year.

Conclusions: Early and long-term results of allograft replacement are at least similar to those of other methods to management infrarenal aortic graft infections. Rare specific complications include early or late allograft rupture and late aortic dilatation.

Keywords: allograft replacement for aortic infection

OP-006

Results of Abdominal Aort Aneurysm Surgery in Chronic Renal Insufficiency; Open Surgery vs. EVAR

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Aim: Aim of the study is to compare the patients in two groups among those whom had been operated by open surgery or EVAR due to abdominal aorta aneurysm. The patients were evaluated in two groups in both processes those having normal renal functions and the other patients group having chronic renal insufficiency (CRI).

Materials-Methods: Between January 2009 and October 2012, we evaluated 185 patient whom had been done abdominal aorta aneurysm surgery, retrospectively. Group I (n = 124) open surgery (Group Ia (n = 74) patients with preoperatively normal renal functions, Group Ib (n = 50) patients with preoperatively CRI), Group II (n = 79) EVAR (Group IIa (n = 32) patients with preoperatively normal renal functions, Group IIb (n = 29) patients with preoperatively CRI).

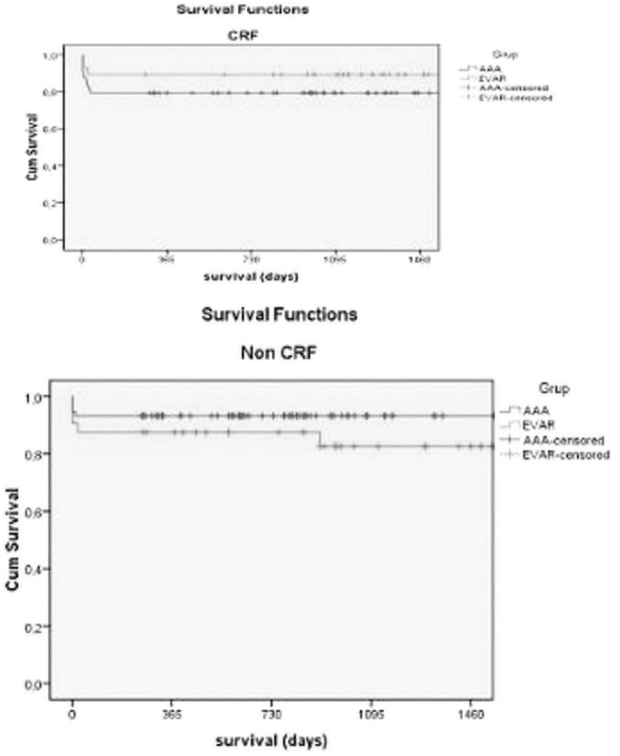
Results: Comparison between demographic datas and findings of groups were summarized at Table 1. In group II, considering endoleak ratio, there were no statistically significant difference between group IIa and IIb. Among the CRI cases with normal renal functions; assesment of short, mid and long term survivals; the results revealed that Group II patients had significantly longer survival period compared to Group I. However, comparing the CRI patients with the non-CRI patients there were no significant difference (Figure 1).

Conclusions: Chronic renal insufficiency (CRI) presence in the medical history of the patients had been assessed as an important risk factor prior to major cardiovascular prosedures. In our study, CRI history of the patients has not significantly altered the expected postoperative complications and also observed that short, mid and long term survival were not significantly altered after the abdominal aorta surgery managed either by open surgery or EVAR. We concluded that, under effective renal replacement therapy, EVAR procedure should be efficiently done to the patients whom have CRI.

Table 1. Datas and findings of patients

	Group IA n = 74	Group IB n=50		Group IIA n=32	Group IIB n=29	
Age	67,2 ± 10, 4	(29–87 years)		69,8 ± 9	(43–91 years)	p = 0,098
Gender	Female = 8 Male = 66	Female = 3 Male = 47	p = 0,523	Female = 3 Male = 29	Female = 4 Male = 25	p = 0,699
Hypertension	56(%75,6)	30(%60)	p = 0,063	19(%59,3)	18(%62)	p = 0,830
Diabetes mellitus	20(%27,0)	18(%36)	p = 0,288	13(%40,6)	9(%31)	p = 0,436
Coronary artery disease	19(%25,6)	11(%22)	p = 0,639	3(%9,4)	4(%13,7)	p = 0,699
Previously abdominal surgery	3(% 4)	1(%2)	p = 0,647	2(%6,2)	0	p = 493
Emergency	5(%6,8)	10(%20)	p = 0,046	5(%15,6)	3(%10,3)	p = 0,710
Rupture	15(%20,2)	21(%42)	p = 0,009	4(%12,5)	6(%20, 6)	p = 0,496
Anesthesia (general)	62(%83,7)	48(%96)		18(%56,2)	14(%48,2)	
Anesthesia (local-spinal)	12(%16,2)	2(%4)	p = 0,035	14(%43,7)	15(%51,7)	p = 0,533
Major Postoperatively complication	8(%10,8)	6(%12)	p = 0, 837	3(%9,4)	5(%17,2)	p = 0,460
Postoperatively revision	7(%9,4)	11(%22)	p = 0,052	11(%34,3)	4(%13,7)	p = 0,062
Total erythrocyte suspension usage (1 bag contains 450 ml)	2, 9 ± 3,5 bag	(0–18)		2, 3 ± 3 bag	(0–17)	p = 0, 313
Total fresh frozen plasma usage (1 bag contains 500 ml)	3, 5 ± 4, 5 bag	(0–30)		1, 8 ± 2,5 bag	(0–14)	p = 0,000
Total early mortality	10 patient	(%20)		3 patient	(%10,3)	p = 0,353
Total endoleak				11(%34,3)	5(%17,2)	p = 0,219
Endoleak Tip I				3(%9,4)	2(%6,9)	
Endoleak Tip II				5(%15,6)	3(%10,3)	
Endoleak Tip III				3(%9,4)	0	
1 year survive	%92,06	%86,6		76,7%	%89,2	
2 years survive	%89,13	%84		%73,6	%88,4	
3 year survival rates	%73,6	%68,7		%58,3	%85,7	
4 year survival rates	%58,3	%58,3		%23,07	%57,14	
1-year mortality	%7,9	%13,3		%23,25	%10,7	
2-year mortality	%10,8	%16		%26,3	%11,5	
3-year mortality	%26,3	%31,25		%41,6	%14,2	
4-year mortality	%41,6	%41,6		%76,9	%42,8	
Total survive (day)	743,5 ± 542,7			953,4 ± 493,2		p = 0, 012

Survival analysis



Keywords: abdominal aorta aneurysm, open abdominal aorta aneurysm surgery, EVAR

OP-007

Management Options of Visceral Artery Aneurysms

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Purpose: Visceral artery aneurysms (VAAs) are uncommon but important as they have a significant potential for rupture, resulting in high mortality rates. The purpose of this study was to review our experience with VAA treatment at a single institution.

Methods and Results: Between January 1995 and August 2013, 42 VAAs were treated in 39 patients (28 males, 11 females) with mean age of 58.6 years old (range, 21–80). Postoperative visceral artery pseudoaneurysms were excluded from this study. The lesion involved the splenic artery (n = 19), superior mesenteric artery (n = 6), hepatic artery (n = 2), common celiomesenteric trunk (n = 2), pancreaticoduodenal artery (n = 6), celiac trunk (n = 3), gastroduodenal artery (n = 3), and left gastroepiploic artery (n = 1). The aneurysms of 30 patients were asymptomatic, but only one aneurysm of pancreaticoduodenal artery (PDA) was ruptured. Twenty three patients had endovascular procedures, 14 patients underwent open surgical repair, one patient underwent laparoscopic surgery, and one patient underwent hybrid surgery (open+endo). In the endovascular group, VAAs were treated by coil embolization (n = 22), and covered stent placement (n = 1). In the open surgery group, VAAs were treated by splenectomy (n = 4), aneurysmectomy (n = 3), aneurysmorrhaphy (n = 1), and aneurysmectomy with arterial reconstruction (n = 6). The results were satisfactory enough with no severe perioperative complication or death, but one patient (PDA) had a duodenal stenosis, which resolved with conservative management. No aneurysm reperfusion or enlargement was observed during follow-up period.

Conclusions: Our study suggests that an aggressive treatment of VAA is justified, even in the case of asymptomatic VAA, because of the low morbidity and mortality rates. Endovascular management of VAA is a reasonable and preferable alternative to open surgical repair in anatomically suitable patients. Regardless of the type of intervention, it is critically important to assess and maintain end organ perfusion via adequate collateral circulation or direct revascularization.

Keywords: visceral artery aneurysm, endovascular treatment, bypass surgery

OP-008

Surgical Treatment of Middle Aortic Syndrome with Takayasu's Arteritis or Dysplastic Syndrome

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Introduction: Middle aortic syndrome (MAS) is stenosis of the distal thoracic and/or the abdominal aorta. This study is undertaken to review the surgical methods and outcomes of MAS.

Methods: Ten patients, 8 females and 2 males (mean age, 47 ± 11.3 years; range 23–59 years), underwent surgical treatment of MAS between July 1992 and January 2013. Medical records and radiographic imaging were examined.

Result: The etiologies of MAS were Takayasu`s arteritis (n = 7) and midaortic dysplastic syndrome (n = 3). Indications for operation were hypertension in 6 patients and lower extremity claudication in 4. Aortic bypasses were done in 8 patients, and one resection of descending thoracic aorta (DTA) and interposition graft and one bilateral aorto-renal bypass were done. The inflows of the aortic bypasses were DTA in 5, supraceliac aorta in 1 and infrarenal aorta in 2. Adjuctive renal bypass (n = 4) and IMA reimplantation (n = 2) were performed simulatenously. Postoperative mortality was none and one complication of iliac dissection at distal anastomosis site was treated with stenting. During the median follow-up of 50 months, leg claudication has improved in all, and hypertension has cured or improved in 4 of 6 patients. All the aortic bypasses were patent. One renal artery bypass graft was occluded after 29 months.

Conclusions: Open repair of MAS is safe and durable and transabdominal repair is possible in selected cases. Considering the patients are relatively young, aggressive surgical treatment may be beneficial. But in patients with vasculitis, proper immunosuppressive therapy and life-long follow-up is mandatory.

Keywords: takayasu arteritis, midarotic dysplastic syndrome, aorta

OP-009

Single-Centre Experience with the ANACONDA Stent Graft for Abdominal Aortic Aneuryrsms

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Aim: The aim of the study was to report a single-centre experience with the use of the ANACONDA stent-graft for endovascular repair of abdominal aortic aneurysms (AAAs).

Material-Methods: Between April 2007 and June 2013, a total of 74 (72 male) patients were treated with the second-generation ANACONDA device. The mean age was 72 years (range 55–83) and the mean maximum aneurysm diameter was 59.56 mm (range 48–90 mm). There were 2 patients who were operated as an emergency for a ruptured AAA, 7 were symptomatic and treated on an urgent basis, and the remaining were elective cases. Two patients had an inflammatory aneurysm. Patients had been operated upon under local anaesthesia supplemented by intravenous sedation. The follow-up protocol included clinical visits, plain abdominal films and contract enhanced CT on the 1st, 6th, 12th month after surgery and annually thereafter.

Results: All patients had successfully implanted endografts. The primary and the assisted-primary technical success was 93% (69/74) and 97% (72/74), respectively. Three patients required reoperation within 30 days (one for stent-graft thrombosis treated with thrombectomy and femoral–femoral crossover bypass, one for limb stenosis treated with kissing balloon angioplasty, and one for type 1b endoleak requiring an iliac limb extension). There were no deaths within 30 days in the elective or symptomatic group, but one of the two patients with ruptured AAA died on the 5th post-op day from cardiorespiratory failure. Four patients died during the follow-up, none from aneurysm-related causes. Another two patients underwent re-intervention for type 1b endoleak requiring iliac limb extensions. No aneurysm ruptured during the follow-up.

Conclusion: The ANACONDA stent-graft is effective in the treatment of AAAs as far as short- and mid-term results are considered.

Keywords: anaconda, stent graft, abdominal, aortic, aneurysm, EVAR

OP-010

Endovascular Repair of Ruptured Abdominal Aortic Aneurysms: Comparison of the Peri-Operative Results of Two Different Bifurcated Endografts

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Purpose: The aim of this study was to compare two endovascular bifurcated devices used in our unit for endovascular repair of ruptured abdominal aortic aneurysms (RAAAs) and to examine their influence to the perioperative outcome.

Material and Methods: The vascular unit database was interrogated. Two bifurcated endografts had been compared, one with infrarenal fixation (Excluder, Gore, n = 20) and one with suprarenal fixation (Endurant, Medtronic, n = 8). Only true ruptures had been included. Demographic data, intra-operative parameters and results had been compared.

Results: Proximal neck length, neck diameter and angulation were no statistically different in the two groups, but aneurysms tended to be larger in the Endurant group. The procedures were performed under local anaesthesia and intravenous sedation. 40% and 25% of patients in each group were haemodynamically unstable (p = 0.7) and balloon occlusion was required in 20% and 25% of the patients, respectively (p = 1.0). Endograft deployment was successful in all. Three patients in each group required proximal aortic cuff intra-operatively to achieve aneurysm sealing. In total, 5 patients died within 30 days with no statistical difference between the groups. Death causes in the Excluder group included severe hypovolaemic shock in two patients, arrhythmia in one and cardiorespiratory failure also in one, whereas in the Endurant group there was one death from cardiac causes.

Conclusion: Endovascular RAAA repair with both the Excluder and the Endurant devices was associated with acceptable mortality in this small patient sample. The presence of suprarenal fixation did not appear to influence outcome. Larger studies are needed to delineate this further.

Keywords: EVAR, ruptured aneurysm, excluder, endurant

OP-011

Early and Midterm Results of Endovascular Treatment of Aortic Pathologies

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Aim: Endovascular approach, that was originally developed for the high-risk patients, has today been the most commonly preferred in most aortic pathologies.

Material and Methods: This study evaluates the short and mid-term clinical outcomes of 48 consecutive patients who underwent endovascular aortic repair between 2008–2012. The average age of the patients (M/F = 46/2) was 68.4 years (range, 38–86 years).

Distribution of cases

Aortic pathologies	Number of patients	Percentage of patients	Endovascular approach
Acute Type 1 aortic dissection	2	4,2%	TEVAR (hybrid)
Acute Type 3a Aortic Dissection	1	2,1%	TEVAR (hybrid)
Chronic Type 3a Aortic Dissection	2	4,2%	TEVAR (hybrid)
Chronic Type 3b Aortic Dissection	1	2,1%	TEVAR (hybrid)
Arcus Aort Aneurysm	2	4,2%	TEVAR (hybrid)
Desending Thoracic Aortic Aneurysm	4	8,3%	TEVAR
Chronic Abdominal Aortic Dissection (via iliac re-entry)	1	2,1%	EVAR
Ruptured Abdominal Aortic Aneurysm	2	4,2%	EVAR
Infrarenal Abdominal Aortic Aneurysm	16	33,3%	EVAR
Aortoiliac aneurysm	11	22,9%	EVAR
Common Iliac Artery Aneurysm (involving in aortic bifurcation)	4	8,3%	EVAR
Descending Thoracic Aortic Aneurysm + Aortoiliac Aneurysm	1	2,1%	TEVAR + EVAR
Desending Thoracic Aortic Aneurysm + İnfrarenal Abdominal Aortic Aneurysm	1	2,1%	TEVAR + EVAR
Total	48	100%	40 only, 8 hybrid

33 abdominal (2 ruptured), 6 thoracic, 2 thoracic + abdominal aortic aneurysms and 4 DeBakey type 3 (1 acute), 2 acute DeBakey type 1, 1 abdominal aortic dissections diagnosis received 34 EVAR (1 hybrid), 11 TEVAR (7 hybrid), 2 simultaneous TEVAR + EVAR procedures. During a mean follow-up period of 22 (0–49) months, the patients were checked physically and monitored by computerized tomography at 1, 6, 12 months and annually thereafter. 2 EVAR cases (4.2%) led to perioperative mortality. Apart from these cases, no serious morbidity or mortality was experienced in the short term. As for the mid-term consequences, aneurysm related complications (aortoesophageal fistula, n = 1, aneurysm rupture, n = 1) in 2 TEVAR cases (4.3%) led to mortality. 5 patients were lost due to other causes. 6 patients in perioperative period (type I endoleak n = 4, retrograde migration n = 1, distal embolization n = 1) and 3 in mid-term period (graft limb thrombosis n = 1, aortoesophageal fistula n = 1, aneurysm rupture n = 1) had complications (n = 9, 19.6%) that required a secondary intervention. Other complications included type II endoleak in 4 patients (8.7%), and a temporary increase in serum creatinine of another 4 patients (8.7%).

Results: As the results of the study revealed, technical success proved 95.7% while clinical success was 91.3%.

Conclusions: Consequently, we do believe that endovascular treatment is an effective and safe method for treatment of aortic aneurysms and dissections that has reached a high level of achievement with the positive early and mid term outcomes it has attained.

Keywords: endovascular aortic repair, hybrid treatment, thoracal aortic aneurysm, abdominal aortic aneurysm, aortic dissection, iliac artery aneurysm

OP-012

Management of Type II Endoleaks

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Management of Type II Endoleaks
Natural History of Type 2 endoleak
Incidence 8–45%
Spontaneously seal within 6 months in 35–62% of cases
Mean time to sealing 14 months
Freedom from AAA enlargment at 5 years 80%
Origin from
–Lumbar arteries
–Inferior mesenteric artery
Type 2 endoleak may occur late
Not all type 2 endoleak are the same
–Typically benign course
–AAA enlargement
–AAA rupture
When to treat type 2 endoleaks?
AAA sac enlargement

Increase in volume >10%
Increase in diameter >5mm
Presence >12 months
Treatment Options for Type 2 Endoleaks
• endovascular technique
Embolization -Coils, -glue, -Gel foam
Selective catheterization of feeding vessels
–SMA, Hypogastric
Trans-lumbar
Trans IVC approach
• Surgery
Summary
Type 2 Endoleaks occur commonly after EVAR of AAA
Differentiate from Type 1 and 3 Endoleaks
Treatment if:
–Diameter increase >5 mm
–Volume increase >10%
Long-term follow up essential !

Keywords: AAA, endoleaks, treatment

ABDOMINAL VASCULAR DISEASE 2

OP-013

Outcomes of Ruptured Abdominal Aortic Aneurysms Between Endovascular and Open Aneurysm Repair

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Objective: To analyze the early and late outcomes of endovascular techniques in the treatment of ruptured abdominal aortic aneurysm (RAAA) in relation to surgical open repair.
Methods: Between January 2006 and February 2013, 57 patients were diagnosed with RAAA. In particular, 26 patients underwent endovascular aneurysm repair (EVAR) and 31 patients were treated by open aneurysm repair (OAR). Primary end point was perioperative mortality. Secondary end points were composed of procedural details, perioperative complications, length of ICU and hospital stays, as well as re-intervention and survival rate during the late follow-up.
Results: Perioperative mortality was 19.2% (n = 5/26) for the EVAR group and 16.1% (n = 5/31) for the OAR group (P = 0.759). The EVAR group had significantly less operative time, blood loss and transfusion than the OAR group (P = 0.759). The EVAR group had significantly less operative time, blood loss and transfusion than the OAR group (P <0.05). There were no statistically significant differences in perioperative complications rate (76.9% vs. 76.4%, P = 0.96) and perioperative re-intervention rate (16% vs. 16.1%, P = 1.0) between the EVAR and OAR groups.In addition, the EVAR group showed no statistical significance of ICU stays (11.9 days vs. 16.2 days, P = 0.35) and hospital stays (20.5 days vs. 31.7 days, P = 0.1) compared with the OAR group. However, the OAR group had a better 2-year survival rate than the EVAR group (67.9% vs. 42%, P = 0.04).
Conclusions: In RAAA patients, the EVAR group might have the benefit of procedural details, ICU and hospital stays compared with the OAR group. Although the perioperative death and midterm re-intervention rate had no statistical difference in the two groups of patients, the OAR group had longer midterm survival rate than EVAR group.

Keywords: ruptured AAA, endovascular aortic repair, open aneurysmal aortic repair

OP-014

Advanced Diabetes is Associated with Lower Risk for Abdominal Aortic Aneurysms Rupture: A Population-Based Study in Taiwan

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Background: Diabetes (DM) can induce "atherosclerotic" change of vessels and followed lethal complications. Current series of studies suggest a protective role of diabetes in the development of abdominal aortic aneurysms (AAAs). When followed this options, the more complicated diabetic condition, which always reflected persistent hyperglycemia status, could offer more protective effect in aneurysm progression than well-controlled diabetic patients. We determine the relationship between advanced diabetic condition and incidence of abdominal aortic aneurysm, rupture event.
Methods and Results: Data analyzed in this study were retrieved from the Taiwan National Health Insurance Research Database (NHIRD). Type I DM was excluded. The 160,391 patients with DM and 646,710 comparisons were similar in sex and age distribution, with a mean age of 69.9 (SD, 8.90) years. The severity of diabetes partitioned as advanced and uncomplicated status according to coexist DM-related disease. DM patients had a 20% lower risk of abdominal aortic aneurysm than non-DM patients (unadjusted HR = 0.85). Male gender, hypertension, chronic kidney disease and ischemic heart disease were associated with increased risk of developing AAA. Sex-specific analysis showed higher beneficial effect from DM patients in men than in women (IRR = 0.79 vs. 1.01). Compared to the severity of diabetes in association with AAA, the advanced DM patients showed 47% lower risk in in abdominal aneurysm without rupture group (adjusted HR = 0.53). The advanced DM patients had a protective effect in aneurysm rupture

Incidence, and hazard ratios of TAWR, TAR, AAAW and AAAR between different level diabetes mellitus in patients aged 55 years or more

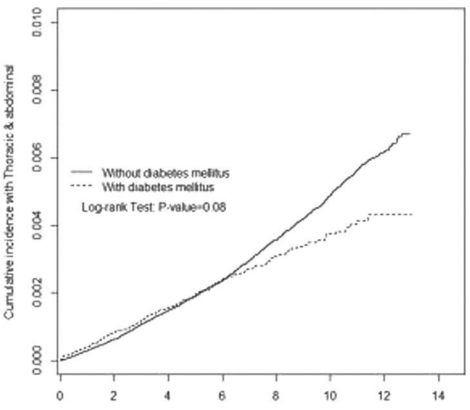
	Variables	Event	Rate#	IRR* (95% CI)	Adjusted HR (95% CI)
TAWR‡					
	Non-DM	80	0.19	1 (Reference)	1 (Reference)
	Uncomplicated DM	12	0.39	2.09 (1.14, 3.84)*	1.19 (0.62, 2.30)
	Advanced DM	18	0.42	2.25 (1.35, 3.76)**	1.44 (0.81, 2.54)
TAR‡					
	Non-DM	562	1.32	1(Reference)	1 (Reference)
	Uncomplicated DM	49	1.60	1.22 (1.18, 1.26)***	0.85 (0.63, 1.16)
	Advanced DM	34	0.80	0.61 (0.58, 0.63)***	0.50 (0.35, 0.71)***
AAAW‡					
	Non-DM	1118	2.62	1 (Reference)	1 (Reference)
	Uncomplicated DM	62	2.03	0.69 (0.67, 0.71)***	0.58 (0.45, 0.74)***
	Advanced DM	77	1.81	0.77 (0.74, 0.80)***	0.53 (0.40, 0.69)***
AAAR‡					
	Non-DM	167	0.39	1 (Reference)	1 (Reference)
	Uncomplicated DM	19	0.45	1.59 (1.54, 1.64)***	1.17 (0.70, 1.95)
	Advanced DM	11	0.36	0.66* (0.63, 0.69)***	0.57 (0.30, 1.09)

Rate#, incidence rate, per 10,000 person-years; IRR, incidence rate ratio Adjusted HR†: multivariable analysis including age, sex, and co-morbidities *p<0.05, **p<0.01, ***p<0.001 ‡TAWR, thoracic aneurysm with rupture; TAR, thoracic aneurysm with rupture; AAAW, abdominal aneurysm without mention of rupture; AAAR, abdominal aneurysm, ruptured ICD-9-CM: uncomplicated DM, 250.0-250.3; advanced DM, 250.4- 250.9; TAWR, 441.1; TAR, 441.2; AAAW, 441.4; AAAR, 441.3*

group (adjusted HR = 0.57). Thoracic aortic aneurysms were included in the comparisons. Advanced DM patients showed a significant valve, adjusted HR 0.50 (p <0.001).

Conclusions: The inverse relationship between DM and AAA was determinate in the study. Our results revealed that the more advanced diabetic condition was related to lower risk of abdominal aortic aneurysms rupture. The implication of diabetic severity comparison to AAA rupture event is impressed and representative in Asian current documented articles.

Probability free of abdominal and thoracic aortic aneurysm for patients with (dashed line) or without (solid line) diabetes mellitus



Diabetes mellitus, No.						
At risk	119558	79138	49673	28627	13767	3667
TAA & AAA events	114	72	51	27	13	5
Non-Diabetes mellitus, No.						
At risk	602768	469334	347014	234320	132752	41872
TAA & AAA events	397	453	358	352	236	117

Incidence rate/10,000 person-years (95% CI)	<4y	4-8y	>8 y
Diabetes mellitus	3.97(3.90, 4.06)	1.67(1.63, 1.70)	3.01(2.86, 3.16)
Non-Diabetes mellitus	3.67(3.63, 3.71)	5.11(5.05, 5.16)	6.56(6.49, 6.69)
Hazard ratio(95% CI)	0.74(0.63, 0.88)	0.55(0.42, 0.71)	0.41(0.25, 0.68)
P-value	<0.001	<0.001	<0.001

Keywords: abdominal aorta aneurysm, aneurysm rupture, diabetes mellitus

OP-015

Isolated Iliac Artery Aneurysms: Endovascular versus Open Repair

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Aim: To compare endovascular and open repair of isolated iliac artery aneurysms (IAAs).

Material-Methods: The patients with diameter of infrarenal aorta greater than 30 mm were excluded from the study. We present the results of 45 patients with 55 isolated IAAs that were treated between April 1998 and January 2013 in our center. The patients were divided into two groups: “open” group (O group) and “endovascular” group (E group). The number of patients was 25 in O group and 16 in E group. In O group, bifurcated aortoiliac graft replacement was performed in 13 cases, and straight iliac graft replacement was performed in 12 cases. In E group, coil

embolization of the internal iliac artery was performed in 14 cases, bifuracated stentgraft placement in 8 and straight stentgraft placement in 4.
Results: The mean follow-up period was 48.8 ± 47.3 months in O group and 15.8 ± 11.7 months in E group. Comparison of operative time (280 minutes in O group, 180 minutes in E group), intraoperative blood loss (661 ml in O group, 99 ml in E group), hospital stay (16 days in O group, 10 days in E group) revealed significant difference ($p < 0.05$) in favor of E group. There was no operative mortality in both groups. The postoperative complication was found 7 cases in O group and 2 cases in E group. In one E group patient, additional stentgraft placement was performed due to sac enlargement 21 months after coil embolization.
Conclusions: Early results of endovascular repair for isolated IAAs were better than those of open repair in terms of operative time, intraoperative blood loss and hospital stay. However, careful postoperative observation is needed in endovascular repair in terms of new endoleak and sac enlargement.

Keywords: isolated iliac artery aneurysm, endovascular treatment, open surgical treatment

OP-016

Efficacy of Transcatheter Arterial Embolization of IMA During EVAR

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Background and Aim: We have reported internal mesenteric artery (IMA) more than 2.5 mm in diameter without stenosis or calcification at its origin may become the cause of persistent type II endoleak. The purpose of this study is to evaluate the efficacy of simultaneous transarterial embolization (TAE) of IMA during EVAR procedure.
Materials and Method: From July 2007 to January 2011, 3 male patients (78–80 year-old) of 187 EVAR patients underwent TAE of IMA as the secondary procedure, when the aneurysm expand more than 5 mm 6 to 30 months after EVAR. The orifice of IMA was approached from SMA via meandering artery and occluded with conventional spring coils. After February 2011, 22 patients (one female, 59–89 year-old) of 101 patients underwent simultaneous TAE of IMA during EVAR. IMA was occluded with detachable coils after selective catheterization. The indication of simultaneous TAE were as follows; (1) more than 2.5 mm in diameter, (2) no stenosis nor calcification at its origin.
Results: Procedure time for secondary and simultaneous TAE was 174 + 26 min and 30 + 20 min ($p = 0.006$). Contrast material used during TAE procedure was 106 + 15 ml and 21 + 16 ml ($p = 0.007$). The number of coils used was 14.3 and 3 coils. After the application of simultaneous TAE of IMA, the incidence of type 2 endoleak from IMA decreased to 5.9% (6/101) from 11.8% (22/187) ($p = 0.09$) and from all branches (IMA, lumbar, medial sacral arteries) to 13.9% (14/101) from 32.1% (60/187) ($p = 0.0006$).
Conclusion: Simultaneous TAE of IMA during EVAR in selected patients resulted the decrease of persistent type II endoleak not only from IMA but also from all branches.

Keywords: EVAR, IMA, TAE, CT

OP-017

Research of Celiac Trunk Caveraged in Endovascular Aneurysm Repair

Luo Ying Wei, Zhang Jian, Xin Shi Jie

Objective: To research the methods and significance of celiac trunk coveraged in Endovascular aneurysm repair.
Method: 96 patients between January 2008 to May 2013 in No. 1 hospital of China Medical University (82 patients of AD, 9 of TAA and 5 of Deceleration injury). Focus on the anatomic variation of celiac trunk and collateral circulation establishment intraoperative angiography. Celiac trunk coveraged in 6 patients.
Results: Technical success was achieved in 100%, No Abdominal distension and pain happened perioperative, No obvious difference in liver function. Follow-up so far, 1 patient has abdominal uncomfortable occasionally, but no other symptoms happened.
Conclusion: Celiac trunk coveraged in Endovascular aneurysm repair is safe, but a larger sample data is needed.

Keywords: celiac trunk caveraged, endovascular aneurysm repair

OP-018

Glasgow Aneurysm Score (GAS) in Predicting Outcome After Ruptured Abdominal Aortic Aneurysm

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Objective: To assess the ability of GAS in predicting postoperative mortality for ruptured aortic aneurysm which may assist in decision making regarding the open surgical repair of an individual patient.
Methods: A total of 121 patients diagnosed of ruptured abdominal aort aneurysm who underwent open surgery in our hospital between

1999 and 2013 were included. The GAS score for each patient was graded according to the GAS score (GAS = age in years + 17 for shock, 7 for myocardial disease+10 for cerebrovascular disease+14 for renal disease). The groups were divided as Group 1 containing the patients who died and Group 2 the patients who were discharged. The GAS scores amongst the groups were compared.

Results: Out of 121 patients, 108 (89.3%) were male and 13 (10.7%) were female. The in-hospital mortality was 48 (39.7%) patients. The GCS was 84.15 ± 15.94 in group 1 and 75.14 ± 14.67 in group 2 (p = 0.002) which revealed significance. The other significant differences among the groups were; duration of ventilation (p = 0.001), number of ES (p = 0.001), number of FFP (0.002), ICU stay (p = 0.011), hospital stay (p = 0.001). The most appropriate cut-off value for GCS was determined at 78.5. (The ROC curve analysis revealed an area under the curve as 0.669, p = 0.002, sensitivity: 64.6%, specificity: 60.3%.) The mortality in the patients with a GAS value below 78.5 was 17 patients (27.9%) and in the patients with a GAS value above 78.5 was 31 patients (51.7%). GAS value above 78.5 is associated with almost three-fold increase in mortality (p = 0.007, OR: 2.76, 95% CI 1.30–5.89).

Conclusion: GAS may have a predictive value for outcome of patients with ruptured abdominal aortic aneurysm undergoing open surgical procedure and it appears to be a useful tool in clinical decision-making of an individual patient when integrated with clinical experience.

Keywords: glasgow aneurysm score, ruptured abdominal aortic aneurysm

OP-019

Glasgow Aneurysm Scores in Surgical or Endovascular Abdominal Aortic Aneurysm Repair

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Aim: To assess the applicability of the Glasgow aneurysm score (GAS) in patients with aortic aneurysm undergoing an elective open surgical procedure or EVAR (endovascular aneurysm repair) in our hospital.

Material Methods: A total of 169 patients undergoing surgery between January 2006 and June 2012 were evaluated retrospectively. Glasgow aneurysm score (GAS) was calculated as age+7 points for myocardial disease+10 points for cerebrovascular disease+14 points for renal disease. The best cut-off values for GAS was determined using the ROC curve analysis.

Results: The hospital mortality rate was 5.3% for all patients. Sixty four (37.9%) patients had undergone endovascular repair (EVAR) with a 7.8% hospital mortality rate. Patients who survived the procedure had significantly lower intensive care unit stay times compared to the non survivors (2.4 ± 8.7 vs. 5.8 ± 5.8 days respectively, p = 0.032. The area under the ROC curve was 0.747 for EVAR patients, and all patients with a GAS <78.5 survived the procedure (p = 0.068). Therefore for a 100% sensitivity rate, the cut-off value for GAS is 78.5 with a 59.3% specificity rate. The hospital mortality rate was 3.8% in patients who were surgically treated (101 patients). GAS was significantly lower in patients who survived the operation (76.1 ± 14.7 vs. 92.0 ± 10.8 respectively, p = 0.035). The area under the ROC curve was 0.818 and for a 100% sensitivity rate, the cut-off value for GAS was 77.5 with a 58.4% specificity rate (p = 0.031). All patients with a GAS <77.5 were alive after surgery.

Conclusion: The GAS appears to be a reliable clinical predictor for in hospital mortality following elective repair of abdominal aortic aneurysm using either an open surgical technique or EVAR.

Keywords: abdominal aortic aneurysm, endovascular aneurysm repair

OP-020

Iliac Bifurcated Device for Aortoiliac Aneurysm: Experience from Hong Kong East Cluster

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Introduction: Iliac bifurcated device (IBD) is decided for preservation of internal iliac artery in order to reduce complication and disability. The aim of this study is to present the technical aspect and early result of iliac bifurcated device for aortoiliac aneurysm.

Method: Since 2009, 17 IBDs were scheduled for 14 patients with mean follow up 14.6 ± 6.3 month. Common iliac artery aneurysms (CIAA) were unilateral in 11 patient and bilateral in 3 patients. 3 patients in our series have associated juxtarenal abdominal aortic aneurysm managed with Chimney technique (ChEVAR). Zenith bifurcated iliac side branch device (Cook inc) was used in all patients. Brachial access was used for bilateral IBDs or Chimney technique. The bridging stent for internal iliac artery (IIA) used were either Fluency Stent graft (Bard) or Advanta V12 (Atrium). Percutaneous technique instead of open groin dissection was adopted in 9 out of 14 patients.

Result: The technical success rate was 94% within the 17 intended to treat common iliac artery aneurysms. Failure of left IIA cannulation on a patient planned for bilateral IBDs. 30-day mortality was nil. 2 patients with unilateral repair had internal iliac artery side branch occlusion without ischaemic symptoms. 4 out of 11 patients (36%) with type IIb endoleak detected on follow up CT

scan. There was no postoperative aneurysm expansion.
Conclusion: Iliac bifurcated device is a safe adjunct to endovascular repair for aortoiliac aneurysm or concomitant juxtarenal aneurysm. The early result from our experience is promising. Longer follow up is required to review the mid term result.

Keywords: iliac bifurcated device, aortoiliac aneurysm, internal iliac artery

OP-021

Internal Iliac Artery Embolization During EVAR with Detachable Interlock Microcoil

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Aim: The purpose of this study is to review the effectiveness of a detachable interlock microcoil for embolization of the internal iliac artery during endovascular aneurysm repair (EVAR).
Material-Methods: Between January 2010 and March 2012, a retrospective review was conducted of 40 patients with aortic aneurysms who had undergone EVAR. Among them, 16 patients were referred for embolization of the internal iliac artery for prevention of type II endoleaks. Among 16 patients, 13 patients underwent embolization using a detachable interlock microcoil during EVAR. Technical success, clinical outcome, and complications were reviewed. Computed tomographic angiography and clinical examinations were performed during the follow-up period.
Results: Internal iliac artery embolization using a detachable interlock microcoil for 13 cases was technically successful, with no occurrence of procedure-related complications. Follow up imaging was accomplished in 13 cases. In all cases, computed tomographic angiography did not reveal type II endoleaks. Two of 13 (15%) patients had symptoms of buttock pain and one patient died due to underlying stomach cancer. No significant clinical symptoms, such as bowel ischemia were observed.
Conclusions: To prevent type II endoleaks, internal iliac artery embolization using a detachable interlock microcoil during EVAR is safe and effective.

Keywords: detachable interlock microcoil, endovascular aneurysm repair, internal iliac artery embolization

OP-022

Surgical Strategy for Patients with Abdominal Aortic Aneurysm with Iliac Arterial Aneurysm

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Purpose: The aim of this study was to evaluate the operative procedure and early outcome after open abdominal aortic aneurysm repair (OAAAR) and endovascular aneurysm repair (EVAR) in patients with abdominal aortic aneurysm (AAA) involving the iliac artery.
Methods: From 1990 to July 2013, 605 patients with AAA underwent OAAAR and EVAR in elective situation in Nihon University Hospital. Of 605 patients, 479 patients were treated by OAAAR and 126 patients by EVAR. AAA with iliac artery aneurysm (IAA) were identified in 287 (47.3%) patients included common iliac aneurysm (CIAA) in 183 and internal iliac artery (IIA) in 104 patients as detected by CT scan.
Results: Of 287 patients, this series included OAAAR group in 253 patients and EVAR group in 34 patients with a mean age of 71.0 ± 8.4 and 74.7 ± 8.3 years, respectively. In the OAAAR group, 22 patients underwent AAAR with revascularization of inferior mesenteric artery (IMA) and/or direct revascularization of IIA in 39 (uni:34.bi:5). Both IMA and IIA revascularization were not able to perform in 2 patients. In the EVAR group, 30 patients underwent unilateral coil embolization and bilateral coil embolization in 3 patients. IIA embolization on one side and reconstruction of IIA using Iliac bifurcation graft device (Cook Medical Inc) on one other side in one patient. 30-day operative deaths were 1.2% vs. 0% for OAAAR and EVAR groups, respectively. Post-operative colonic ischemia in one vs. 0 of patients with OAAAR and EVAR, respectively. Patients with EVAR were more likely to develop buttock claudication (1.2% vs. 8.8%).
Conclusion: In this series there were lower incident of ischemic colitis following OAAAR and EVAR, so that we performed reconstruction of IMA or IIA for the patients with absence of adequate flow of IIA as far as possible.

Keywords: abdominal aortic aneurysm, iliac arterial aneurysm, EVAR, open AAA repair

OP-023

Clotrimazole Attenuates Systemic Inflammatory Response and Lung Injury in an Experimental Model of Ruptured Abdominal Aortic Aneurysm

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Aim: Ruptured abdominal aortic aneurysm (RAAA) is associated with systemic inflammatory response and multiple organ dysfunction and the lungs are the most affected remote organs. The purpose of this study is to evaluate the protective effect of clotrimazole (CTZ), which is an antimycotic drug, on lung injury in rats by creating an experimental model RAAA.

Material-Methods: Twenty six male Spraque-Dawley rats, in weights of 420 ± 56g, were divided into 5 groups as Sham (n = 6), Sham+CTZ (n = 6), Sham+PEG (n = 6), Shock/Clamp (S/C) (n = 9) and S/C+CTZ (n = 9). Laparotomy and aortic exploration were performed in all groups under anesthesia and carotid artery and jugular vein canulated. In sham groups saline, clotrimazole (CTZ) end polyethylene glycol (PEG) were administered without shock/clamp and reperfusion were developed. In S/C and S/C+CTZ groups, hemorrhagic shock was developed by drawing blood through one hour as to keep average arterial pressure at 50mmHg, then ischemia was developed by clamping the abdominal aorta in two locations before the supramesenteric and iliac bifurcation. After 1 hour, S/C group was given 1 ml saline and S/C+CTZ group was given 30 mg/kg CTZ; then aortic clamps were opened and left for 2 h reperfusion. At the and of the reperfusion process, serum malondialdehyde (MDA), myeloperoxydase (MPO), tumor necrosis factor alpha (TNFa), interleukin-6 (IL6), ischemia modified albumin (IMA) and blood gases were analysed. Lungs were removed and MDA, MPO, histological examination and wet/ dry ratio were performed in lung tissues.

Results: An increase was observed in all parameters except IL-6 in the S/C group in comparison to Sham groups. In S/C+CTZ group, the serum MPO, MDA, TNFa and lung MPO values, histological lung injury scores and lung tissue wet/dry ratio were decreased significantly when compared S/C group ($p < 0.016$).

Conclusions: These results indicate that clotrimazole may reduce systemic inflammatory response and lung injury due to shock and ischemia/reperfusion in an experimental model of RAAA.

Keywords: RAAA, clotrimazole, experimental

OP-024

Potential Role of Epidural Anesthesia in the Prevention of Mesenteric Ischemia-Reperfusion Injury: An Experimental Study

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Objectives: Epidural anesthesia is known to exert positive effects on mesenteric circulation. In this experimental study, we aimed to examine the effect of epidural anesthesia on mesenteric ischemic-reperfusion injury induced by supracoeliac occlusion in a rabbit model.

Materials: Twenty-eight male white New Zealand rabbits were assigned into 4 separate groups, with 7 rabbits in each group: Group I, control group; Group II, IR-only group; Group III, IR plus epidural anesthesia group; Group IV, epidural anesthesia-only group.

Methods: IR injury was assessed using blood markers IL-6 and IMA and tissue markers SOD and MDA. Also histopathological examination was performed to evaluate the degree of injury.

Results: All biochemical markers in Group II were significantly elevated as compared other three groups including Group III ($p < 0.05$ for all comparisons). This was paralleled by a more severe histopathological injury in Group II. There were no significant differences between the control group and the epidural anesthesia-only group ($p > 0.05$).

Conclusions: Mesenteric IR injury that can occur during abdominal aorta surgery can be alleviated by epidural anesthesia, which is commonly used during or after major operations for pain control. Controlled clinical studies are required to evaluate these findings.

Keywords: epidural anesthesia, mesenteric ischemia, ischemia-reperfusion injury, lidocain, oxidative stress

ABDOMINAL VASCULAR DISEASE 3

OP-025

Surgical Treatment of Aortoiliac Occlusive Disease with Concomittant Superficial Femoral Artery Occlusion

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Introduction: Aortofemoral bypass is a standard method for the surgical treatment of aortoiliac occlusive disease (AOID). Most of the patients with aortoiliac occlusive disease (AOID) have multisegment arterial occlusions extending to the popliteal or distal arterial system. In this research early and long term results of aortobifemoral bypass (ABF) and ABF bypass with combined femoropopliteal bypass were assessed.

Patients and Methods: From March 2002 to October 2011, 833 patients underwent bypass procedures for AIOD with concomittant SFA occlusion. The patients and surgical procedures were studied prospectively. The patients were divided into 2 groups. Group I (n:632) consisted of patients whom only recevied ABF bypass. Group II (n:201) comprised of patients whom ABF bypass combined with femoropopliteal bypass have been performed.

Results: In Group I only ABF bypass was performed, and distal segment of graft was extended to PFA for distal anastomosis. In Group II patients received ABF together with femoropopliteal bypass. In the early (30 days) and late (42 months) follow up periods the rate of amputation and mortality were higher in Group II. Moreover, graft patency, freedom from symptoms and consequences were significantly lower in Group II.

Conclusion: Aortobifermoral bypass procedure is an efficient, safe and durable technique for the surgical management of AIOD combined with superficial femoral artery occlusion. In this circumstance profunda femoris artery plays the major role for the perfusion of limb.

Keywords: aortoiliac occlusive disease, superficial femoral artery, profunda femoris artery, aortobifemoral bypass, femoropopliteal bypass.

OP-026

Outcomes of Open Surgical Repair versus Endovascular Aneurysm Repair in Patients with Infected Abdominal Aortic Aneurysm

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Objective: To compare the early and late outcomes of treatments after open aneurysm repair (OAR) and endovascular aneurysm repair (EVAR) in patients diagnosed with infected abdominal aortic aneurysm (IAAA).

Methods: Retrospective collected data of 46 patients with IAAA from January 2004 to January 2013 at a single institution were analyzed. Secondary from graft infection was excluded. Twenty-three patients underwent EVAR, and OAR. The early and late outcomes were compared between the 2 groups of treatments.

Results: The most common type of aneurysm morphology was saccular, of which 17 (73%) in the OAR group and 22 (91%) in the EVAR group. The majority of etiologic organism was for Salmonella species, accounting for 8 (34%) and 4 (17%) in OAR and EVAR groups respectively. For the procedural details, the EVAR group had less operative time, blood loss and blood transfusion than OAR group, $P < 0.05$. There was no statistical difference for both groups in terms of perioperative complications, technical complications, and ICU stays. Perioperative mortality was comparable between the two groups, accounting for 2 (9%) patients from each group. During the 2-year follow-up, 1 patient in OAR group and 4 patients in EVAR group needed re-intervention due to graft infection. The overall mortality at 2 years was 3 (13%) patients in the OAR group and 8 (34%) patients in the EVAR group, $P = 0.165$.

Conclusion: For the treatment of IAAA, endovascular treatment might provide a good result in the perioperative period but there was more re-intervention and late mortality rate than the open surgical repair.

Keywords: infected abdominal aortic aneurysm (IAAA), endovascular aneurysm repair (EVAR), open aneurysm repair (OAR)

OP-027

Five Year Results of Endovascular Abdominal Aortic Aneurysm Repair from a Single Center

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Objective: Endovascular abdominal aortic aneurysm repair (EVAR) was first introduced in 1991. Since that time it has been shown to have a lower 30 day morbidity and mortality compared to open surgery. The aim of this study is to asses the outcome of EVAR in a single center.

Methods: Between 2007 and 2013, 100 patients underwent EVAR at our center. Demographic data, comorbidities and outcomes were collected from patient records. Primary outcomes were mortality and aneurysm related mortality. Secondary outcomes were endoleak status, major adverse effect and reintervention.

Results: There were 94 males and 6 females. Median age was 69 (43–87). Most cases (95%) were elective, but 5% were urgent due to ruptured aneurysm. Mean hospital stay was 5.03 ± 0.75 and mean intensive care unit stay was 1.05 ± 0.36 days. Patients were followed up to 150 months (6–150) and mean follow-up was 28.4 ± 21.77 months. Technical success was 100% in all patients.There were no in hospital deaths in elective patients. Among the 5 ruptured aneurysm patients mortality was seen in 2 patients. Intraoperative type I endoleak was observed in 6 patients. Those patients were treated with cuff extension and balloon dilatation at the same session. None of the patients were left untreated for type I endoleak at the initial procedure. Late type I endoleak was observed in one patient due to graft migration. Reintervention rate was 1%. Twenty patients died in late postoperative period (19.8%).

Conclusion: EVAR is now accepted as a first line treatment for abdominal aortic aneurysms. It is a safe procedure for both unruptured and ruptured aneuyrsms. Mortality was lower than anticipated which may be explained by improved preoperative planning and centrilization of care in experienced centers.

Keywords: EVAR, abdominal aortic aneurysm

OP-028

"Endurer" Hybrid Endograft Treatment for Abdominal Aortic Aneurysm with Complex Lliac Anatomy: An Endurant Body with Excluder limbs

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The purpose of this study was to evaluate our experience with Gore Excluder limbs in combination with a Medtronic Endurant stent graft system main body for elective endovascular abdominal aortic aneurysm (AAA) repair, "Endurer". The subjects were patients with AAA who were treated endovascularly between December 2011 and July 2013 with a Medtronic Endurant body and either one or two Gore Excluder limbs. Indication, technical success, late limb occlusion, and disconnection were all evaluated.

Among 61 patients who were treated with an Endurant body, 11 underwent hybrid graft repair using a total of 13 Excluder limbs. The indication in every case was complex iliac anatomy (either small caliber or tortuosity of the iliac arteries). The technical success rate in these 11 patients was 100%. Mortality at 30 days was 0%. The mean follow-up was 6 months (range 2–11 months). The late mortality rate was 9.1% (1 of 11 patients), with no aneurysm-related deaths. No graft limb occlusion or disconnection occurred during follow-up. No reintervention was needed in the hybrid endograft group.

The use of a Medtronic Endurant body with Gore Excluder limb(s) in cases with complex iliac anatomy is feasible and showed no short-term adverse effects.

Keywords: abdominal aortic aneurysm, hybrid endograft treatment, medtronic endurant, gore excluder

OP-029

Endovascular vs. Open Repair for AAA: Early Term Results

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Aim: In this study, we aimed to assess early term risk factors on morbidity and mortality of open repair and endovascular graft stent repair (EVAR) done for abdominal aortic aneurysm treatment and to compare the short term mortality and morbidity rates of two treatment modalities.

Material-Methods: Between January 2009 and June 2012, 73 patients who underwent conventional surgical repair or EVAR due to AAA under elective conditions in our clinic were analyzed retrospectively. Mean age was 66.56 ± 8.42. There were 64 men (87.7%) and 9 women (12.3%). All patients are evaluated with CT and conventional angiography. Preoperative risk factors, the ratio of early mortality, loss of blood, requirement of transfusion, duration of mechanical ventilation, postoperative complications, the length of stay in the intensive care unit (ICU), the length of hospital stay were recorded.
Results: Of those 73 patients, 40 underwent conventional surgery and 33 underwent EVAR. In open surgery group, 30 day mortality rate was 7.5% (3/40) which was higher but not significantly different than 30 day mortality rate of EVAR 3% (1/33) ($p > 0.05$). The mean duration of mechanical ventilation, the mean time of ICU stay, the mean time of hospital stay were significantly lower in the EVAR group, compared to open surgery group ($p < 0.05$). In terms of postoperative complications, pneumonia was significantly higher in open surgery group compared to EVAR group ($p < 0.01$). The rates of wound infection, renal dysfunction, vascular complications, gastrointestinal complications and cerebrovascular accidents were lower in the EVAR group compared to open surgery group but the difference was not significant ($p > 0.05$).
Conclusion: EVAR may be a more effective treatment modality for the treatment of AAA with less morbidity and mortality rates compared to open repair for the patients who are elderly and are at high-risk for surgery and those who are anatomically suitable.

Keywords: abdominal aortic aneurysm, endovascular repair, open repair, EVAR

OP-030

Quality of Life Assessment and Comparison of Mid-Term Results of Open Surgical and Endovascular Repair of Abdominal Aortic Aneurysms

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Aim: After early encouraging results of Endovascular Aneurysm Repair (EVAR) for AAA, studies were performed to compare this treatment with open surgical technique. In most of the studies, physical medical condition of patients was the main morbidity and mortality criteria to evaluate the success. In this study evaluated the mid-term results and rates of re-intervention of both procedures. In addition to that we applied Short Form 36 (SF36) questionnaire to the patients to assess the effects of both treatment modality on patients' life quality.

Material-Methods: In our study, we collected data of 73 patients, who underwent either open surgical repair or EVAR procedure with diagnosis of infra-renal AAA, between 2009 and 2012. 4 patients were died in hospital, acknowledged as short term mortality and did not included to our study. During post-operative 1st, 6th and 12th month follow-ups or via phone calls patients were subjected to SF36 questionnaire for quality of life assessment. Open surgical repair and EVAR procedure were compared to each other by evaluating mortality and rate of re-intervention to assess the mid term success.
Results: While 36 (52.9%) of 68 patients underwent open surgical repair, the rest [n: 32 (47.1%)] of them underwent EVAR procedure. Quality of life assessment revealed the supremacy of EVAR to open surgery within first month after treatment ($p < 0.05$). However, this disparity between two techniques vanishes 6 months after treatment ($p > 0.05$). While, mid-term mortality rate after EVAR was estimated 9%, the mid-term mortality rate after open surgery was 16.6% ($p < 0.05$).
Conclusion: Despite having acceptable mid term mortality outcomes in anatomically suitable and surgically high risked patients, when quality of life considered, EVAR does not provide physical function and comfort superiority over open surgical repair 6 months after treatment.

Keywords: abdominal aortic aneurysm, endovascular repair, open repair, quality of life

OP-031

Retrospective Review on Open vs. Endovascular Repair for Ruptured Abdominal Aortic Aneurysm

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Aim: Ruptured abdominal aortic aneurysm is a highly lethal condition. Previous studies had shown that selective use of endovascular repair was associated with lower short term mortality rate than open surgery. This study is to report our experience with endovascular stenting (EVAR) for ruptured abdominal aortic aneurysm comparing with open repair.
Method: A Retrospective review is conducted for patients who had undergone emergency open repair or EVAR from August 2003 to December 2012. Emergency EVAR was available in our hospital since January 2010. A protocol for flow of management for rupture aortic aneurysm with EVAR as a first line treatment irrespectively of the anatomical characteristic of the aneurysm was available since then. The perioperative variables and the outcomes were analyzed.
Result: A total of 70 patients with ruptured AAA had undergone emergency surgery during the time period. Forty one were treated with open repair while 29 were treated with emergency EVAR

respectively. The endovascular devices involved included Medtronic Endurant and Cook Zenith. One of the patients failed endovascular stenting and required open repair. Thirty-day mortality for EVAR group is significantly lower than open group (p = 0.048, 27.59% vs. 51.21%). Blood loss for patients with open repair was significantly higher than patients with EVAR done (p = 0.019, 2949 ml vs. 787 ml). ICU stay and hospital stay are both significantly lower in patients receiving EVAR comparing to open repair (p <0.001, 2.82 vs. 7.41 days, and p = 0.003, 9.32 vs. 13.24 days). There was a higher rate of acute coronary syndrome in patients receiving open repair (p = 0.018, 3.4% vs. 24.4%). Endoleak was detected in 6 patients during follow up computer tomography, in which 3 of them required re-intervention. No mortality occurred in these 6 patients.

Conclusion: Emergency endovascular stenting for ruptured abdominal aortic aneurysm is associated with improved perioperative outcome and mortality comparing with open repair.

Keywords: ruptured abdominal aortic aneurysm, endovascular repair, open repair

OP-032

Peripheral Arterial Disease and Abdominal Aortic Aneurysm in Elderly People: Prevalence and Clinical Predictors

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Aim: Patients with peripheral arterial disease are at increased risk for cardiovascular mortality and mortality from coronary artery disease. In this report we described the prevalence of abdominal aortic aneurysms in patients with peripheral artery disease.

Material and Methods: Between 2009–2013, we performed abdominal ultrasound in 58 patients with documented peripheral arterial disease attending our outpatient clinic for intermittent claudication. For each patient, cardiovascular risk factors and comorbidities and neutrophil counts were registered.

Results: Abdominal aortic aneurysms was present in 5 patients (10.0%), with a not significant higher prevalence in men than in women. Patients with abdominal aortic aneurysms were older (75 ± 6.0 vs. 63.5 ± 2.5 years), were more likely to have hypertension (90% vs. 65%), and greater neutrophil count (5.5 [4.5–6.2] vs. 4.1 [3.2–5.5] × 103/μL). Importantly, neutrophil count was higher than that for age.

Conclusion: Prevalence of abdominal aortic aneurysms in claudicant patients may be higher than that reported. An abdominal ultrasound may be included to the routine check up studies to investigate the abdominal aortic status especially in those with an elevated neutrophil count.

Keywords: peripheral arterial disease, abdominal aortic aneurysm, clinical predictors

OP-033

Acute Mesenteric Ischemia Diseases at Surgical Intensive Care Unit: Analysis of Clinical Characteristics and Risk Factors for Death

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Objective: To analyze the clinical characteristic, related risk factors and prognostic factors of acute mesenteric ischemia (AMI) admitted at the surgical ICU in the First Affiliated Hospital of China Medical University.

Methods: The clinical data of 25 AMI patients admitted to the First Affiliated Hospital of China Medical University were retrospectively analyzed, including 10 patients with acute mesenteric venous thrombosis (MVT) and 15 patients with acute arterial occlusive mesenteric ischemia (AOMT).

Results: In our series, there are 17 men and 8 women; the average age is 59.5 years old. Twelve patients survived, 13 cases died. The most common feature was abdominal pain (100%), followed by vomiting (64%). The average age in the AOMI patients was higher than those in the MVT patients (P <0.05). Both the MVT patients and AOMI patients admitted to the surgical ICU had large intestinal ischemia area. Compared to MVT group, the AOMI group had higher risk of colon involvement (P <0.05), and had more risk of hypertension and atrial fibrillation (P <0.05). The mortality rate at 1 day and 30 days in the two groups as follows: AOMI (20%, 53.3%), MVT (20%, 50%). The risk of shock, renal failure and APACHE II scores in the dead group is higher than that in the survival group (P <0.05).

Conclusions: Acute mesenteric ischemia disease is a life-threatening high mortality disease, early diagnosis and intervention is very important. Compared to the MVT group, the incidence rate of hypertension, atrial fibrillation is higher in the AOMI group with more extensive scope of intestinal ischemia. Mesenteric ischemia diseases complicated with shock, renal failure may increase the risk of death. Shock correcting and early renal protection is important to improve the clinical prognosis.

Keywords: acute mesenteric ischemia, mesenteric venous thrombosis, arterial occlusive mesenteric ischemia, risk factors

OP-034

Endovascular Abdominal Aortic Repair: Single Center Experience with Short-Term Results

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Objectives: To present our experience and short-term results of endovascular aortic repair of abdominal aorta and iliac artery pathologies.

Methods: We performed endovascular stent-graft procedures in 71 patients (65 male) for abdominal aorta and iliac artery pathologies between January 2009 and June 2013. 66 patients underwent endovascular repair for abdominal aortic aneurysm, 2 patients for iliac artery aneurysm, 2 patients for penetrating atherosclerotic ulcer, and 1 patient for iatrogenic rupture. Bifurcated and aorto-to-uni-iliac stent-grafts were placed in 69 and 2 patients, respectively. Chimney tecnique was used in one of these patients for renal artery preserving. All patients were scanned with computerized tomography and/or magnetic resonance imaging pre- and postoperatively.

Results: Mean diameter was 70.18 mm (range 43–120 mm) and 56.75 mm (range 44–72 mm) in patients with fusiform (62 patients) and saccular (4 patients) aortic aneurysms, respectively. Diameters of two patients with iliac aneurysm were 132 mm and 55 mm. Penetrating atherosclerotic ulcers were measured 9 × 18 mm and 20 × 10 mm in diameter. Nine patients (2 open rupture, 7 contained rupture) were treated with emergency endovascular repair. While 16 patients had abdominal pain, others were asymptomatic. Decrease in hemoglobin level was observed in a patient with iatrogenic aortic rupture secondary to surgery of lumbar disc herniation. Four patients (5.6%) needed a second intervention. Groin hematoma in 1 patient and femoral wound dehiscence in another patient were observed. Postoperative 30-day mortality was 7% (5 patients), 3 of which had acute aortic rupture as initial diagnosis. Neurologic sequele was not observed. Hip claudication developed in 2 patients on follow-up. Minimal type-I endoleak in 1 patient and type-II endoleak in 5 patients were observed on follow-up cross-sectional studies.

Conclusion: Endovascular repair of abdominal aortic and iliac artery pathologies is a feasible technique alternative to the open surgery with a low morbidity and mortality, and high success rate. However, high re-intervention rates are a problem to be solved.

Keywords: abdominal aorta, endovascular aortic repair, aortic stent-graft

OP-035

The Role of PET/CT for Diagnosis of Aortic Stent Graft Infection

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Aim: To investigate the diagnostic accuracy of fluoro-2-deoxy-D-glucose positron emission tomography combine with computed tomography (FDG-PET/CT) in diagnosing aortic stent graft infection, and compare with conventional computed tomography and inflammation scan.

Materials-Methods: During August 2011 to August 2012, 16 patients, suspected having aortic stent graft infection after EVAR/TEVAR with or without hybrid procedure, received CT scan, inflammation scan/SPECT and PET/CT to determine stent graft infection.

Results: 6 of the 16 patients were diagnosed as aortic stent graft infection. FDG-PET/CT had the best specificity and accuracy (sensitivity 80%, specificity 100%, positive predictive value 100% and negative predictive value 90%, accuracy 92.9%). For CT, these values were 80%, 77.8%, 66.7% and 87.5%, 78.6%, respectively. For inflammation scan/SPECT, the values were 50%, 88.9%, 66.7%, 80% and 76.9%.

Conclusion: FDG-PET scanning showed excellent diagnostic accuracy for the aortic stent graft infection and the perfect specificity in our cases. This study suggests that FDG-PET provides a useful tool in differential diagnosis for those clinically suspected aortic stent graft infection.

Keywords: stent graft infection, PET/CT, thoracic aneurysm, abdominal aortic aneurysm

OP-036

Paralel Endograft Techniques During Endovascular Aortic Repair in Thoracoabdominal Aortic Aneurysms: Initial Experience

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Objectives: To present our first experience of paralel endograft methods including chimney, periscope, and sandwich techniques that are underwent during endovascular aortic repair for continued perfusion to visseral arteries in thoracoabdominal aortic aneurysms.

Methods: We performed paralel endografts including chimney, periscope, and sandwich techniques during endovascular stent-graft procedures to preserve visseral artery flow in 3 patients

(2 female) for thoracoabdominal aortic aneurysms between February 2013 and June 2013. While aortic stent-grafts and periscope grafts were advanced via femoral arteries, sandwich and chimney grafts were inserted via subklavian or brachial arteries.

Results: The reason of aneurysms was atherosclerosis in two patients and dissection in one patient. There was a history of operation from the proximal descending aorta in the patient with dissection. Seven sandwich grafts, 2 periscope grafts, and 2 chimney grafts as well as aortic stent-grafts were placed. Self-expandable Viabahn® covered stent were only preffered as a parallel graft. Since intraluminal thrombus formation was observed within the superior mesenteric and coeliac arteries during the procedure in the patient with dissection, the procedure was interrupted. Thrombus formation was dissolved with an intra-arterial recombinant tissue-type plasminogen activator. Bilateral groin and left brakial hematoma were developed as a complication in this patient. Second procedure was underwent succesfully the fourth month after first procedure. But, the patient was deceased in postoperative eight hours due to severe mesenteric ischemia accompanying with lactic asidosis and anuria. A limited dissection was developed within the proper hepatic artery due to guiding sheath in an another patient.

Conclusion: Paralel endografts including chimney, periscope, and sandwich techniques applied to preserve visseral artery flow in thoracoabdominal aortic aneurysms are a laborious and time-consuming but effective and feasible alternative treatment option to surgery and fenestrated/branched endografts. The most advantage of this procedure is that it is an also applicable method for emergency patients.

Keywords: chimney, periscope, sandwich, thoracoabdominal aortic aneurysm, endograft, covered stent

CAROTID DISEASE 1

OP-037

Results of Combined Preoperative Direct Percutaneous Embolization and Surgical Excision in Treatment of Carotid Body Tumors

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Background: Carotid body tumors are infrequent neoplasms in daily practice. Diagnostic difficulties exist because of their slow growth and asymptomatic progress. The surgical treatment is complicated and difficult due to their proximity to vascular and neural structures. In this study we present the results of 12 patients operated for carotid body tumor that underwent preoperative percutaneous direct embolization.

Patients And Methods: The data of 12 patients, diagnosed with carotid body tumor and surgically treated at our department between 2000 and 2010, was retrospectively analyzed. Duplex ultrasound, computerized tomography and selective carotid angiography were the applied diagnostic tools. Two days before the planned surgery all patients underwent percutaneous direct embolization to achieve devascularization of the tumor. Afterwards, surgical excision of the mass under general anesthesia was performed in all cases.

Results: Five tumors were classified as Shamblin type I (41.7%), and the others were type II (58.3%). All masses were removed sub-adventitially and no vascular reconstruction was necessary. There was no mortality and no permanent neural damage. Malfunction of the tongue was observed in only one case, which recovered completely in one month. There was one recurrence detected by Duplex ultrasound and angiography during the follow up period.

Conclusions: Surgical excision is mandatory to be performed as soon as diagnosed in carotid body tumors. Preoperative direct percutaneous embolization of the mass helps to devascurize the tumor, enabling an optimal surgical procedure. The outcomes of such a combined intervention are excellent and neurovascular structure preservation decreases complication and morbidity rates.

Keywords: carotid body tumors, embolization, surgical excision

OP-038

The Surgeon's Experience, Not the Closure Type, is More Important for Carotid Endarterectomy

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Purpose: We analyzed the results of carotid endarterectomy (CEA) with either primary closure (PC) or patch angioplasty (PAT) performed by single center vascular surgeons.

Methods: Between 1994 and May 2013, a total of 708 patients underwent 771 consecutive primary CEA procedures in our institution. We retrospectively reviewed patients' medical records. Two vascular surgeons prefer routine PC and one vascular surgeon prefers routine patch closure using bovine pericardial patch. Post-operative neurologic complications were determined by clinical neurologists. Restenosis was defined as >50% stenosis on follow-up duplex scan. Data was analyzed to compare the early (≤30 days) and late results of CEA between PC group and PAT group.

Results: The median follow-up duration was significantly longer in the PC group than that in the PAT group (39.9 months vs. 29.1 months, P <0.001). Coronary artery disease and combined CEA with coronary artery bypass were more common in the PAT group (36% vs. 49%, P <0.001; 3% vs. 9%, P <0.001). Perioperative ipsilateral TIA/stroke rates in the PC and PAT groups were 1.5% and 1.9% (PC = 6/409 vs. PAT = 7/362, P = 0.615). Regarding late outcomes, Kaplan-Meier analysis failed to show any differences between 2 groups on freedom from ipsilateral transient ischemic attack (TIA)/stroke, freedom from restenosis and TIA/stroke-free survival (P = 0.582, P = 0.323, P = 0.262, Log-rank test).

Conclusions: Our results suggest that PC following CEA is not

necessarily inferior to PAT for experienced surgeons.

Keywords: carotid, endarterectomy

OP-039

No Shunted Carotid Endarterectomy in the Presence of Contralateral Internal Carotid Occlusion

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Aim: The necessity for indwelling arterial shunt during carotid endarterectomy (CEA) is a controversial. And also it has been still unclear in contralateral carotid occluded patients. In our clinic, all CEA operations are performed under general anesthesia and without using any shunt. The aim of this study is to evaluate the 30-day outcome of no shunted 53 carotid endarterectomized patients with contralateral carotid artery occlusion.

Material-Methods: Between April 2005 and October 2013, 415 CEA operations were performed in 376 patients. From these, contralateral occluded 53 isolated CEA patients (39 men, 14 women) were evaluated. All the patients were operated with a modified eversion CEA technique, under general anesthesia and without any shunt. (In this technique arteriotomy was extended from the common carotid artery to the external carotid artery.)

Results: Thirty-one patients symptomatic (mean age 63, 2 ± 5, 1) and 22 were asymptomatic (mean age 63, 1 ± 6, 7). Mean cross clamp time was 18 ± 7 minutes. One patient died on the first postoperative day because of a myocardial infarction (1,9%). There were one (1,9%) stroke because of intracranial hemorrhage on post operative 6th day, two (3,8%) TIA, 8 (15,1%) ipsilateral transient peripheral nerve injury (facial asymmetry, lingual deviation, or difficulty in swallowing), one hoarseness (1, 9%) and 5 (9,4%) organic brain damage syndrome.

Conclusion: Compared with the literature our experience reveals that good results can be obtained without a shunt in patients with contralateral occlusion of the carotid artery.

Keywords: carotid endarterectomy, stroke

OP-040

Continuing Clopidogrel Therapy or Clopidogrel Loading Before Carotid Endarterectomy is Not as Risky in Terms of Postoperative Bleeding, Hematoma and Wound Revision

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Aim: The addition of a clopidogrel loading dose to percutaneous interventions lowers the cardiovascular complications. Antithrombotic therapy in surgery is still debate because of bleeding related complications in the postoperative period. This debate is true for the carotid endarterectomy (CE) operations as well. We evaluated the complications that were due to bleeding after CE operations in patients who were not on antithrombotic therapy preoperatively, who were on both antithrombotic and clopidogrel therapy and who were on only antithrombotic therapy but were given a clopidogrel loading dose before the operation.

Material-Methods: Patients with symptomatic carotid arterial disease were divided into 3 groups as Group I (n = 7): No antithrombotic therapy, Group II (n = 19): clopidogrel and antithrombotic therapy (<7 days) and Group III (n = 25) patients with ongoing antithrombotic therapies without the inclusion of clopidogrel that received 600 mg of clopidogrel 2 h before the operation. Patients were evaluated in terms of hemorrhage by the comparison of preoperative and postoperative hemoglobin values and the development of hematomas.

Results: A fall in the hemoglobin values of all 3 group patients due to bleeding have been noted and the difference in comparison with their preoperative values were statistically significant, however, the development of a hematoma was noted in a total of 4 patients with 2 of them being in group II and 2 in Group III. Nevertheless, there were no difference between the groups in terms of complications related to bleeding. Their duration of the operations and the hospital stays were not adversely affected from these complications.

Conclusions: Despite a decrease in hemoglobin levels in all three groups there were no significant differences in terms of hemorrhage related complications which supports the use of or administration of a loading dose of clopidogrel together with the ongoing anticoagulant and/or antiaggregant therapies before CE operations.

Keywords: carotid endarterectomy, antithrombotic therapy, clopidrogel, hematoma, blood loss

OP-041

Superficial Cervical Plexus Block for Carotid Endarterectomy: Cardiovascular and Neurological Outcomes

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Introduction: Carotid endarterectomy is the choice of treatment in critical carotid artery stenosis. Carotid endarterectomy could be applied either under general or local (deep, superficial, combined) cervical plexus block anaesthesia. In this study we aimed to analyze and compare outcome of carotid endarterectomy under local anasthesia with cardiovascular risk groups.

Patients and Method: In our clinic in time phrase between 2008 and 2012 we applied 57 carotid endarterectomy ± patch plasty to 55 patients under combined cervical plexus block anaesthesia. 15 of patients (26.31%) were female. Mean age of patients was 67.79 ± 10.19. Bupivacain and lidocain were used as anaesthesic agent. Saphenous vein, dacron, fabric, PTFE grafts were used as a patch for carotid plasty. Patients included into 3 different groups (high, moderete, low) according to cardiovascular risks.

Results: We did not observed postoperative surgical infection in our study population. Two patients required revision for bleeding, but it did not reached statistical significance ($p > 0.05$). Mortality caused by cerebrovascular event observed in two patients which were in Grup I (High Risk Group) and the other one was in Group II (Moderate Risk Group). But the result did not reached to statistical significance ($p > 0.05$). all asymptomatic patients compared to symptomatic patients had higher mortality rate ($p = 0.004$).

Conclusion: Carotid endarterectomy can be safely performed with cervical block anaesthesia in all cardiovascular risk groups. Studies with high volume are needed comparing general anesthesia and local anesthesia.

Keywords: carotid endarterectomy, combined cervical plexus block

OP-042

Results of Tumors Glomus Caroticum

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Background: Glomus caroticum tumor; has benign nature but usually invades surrounding neural and vascular structures. Usually manifests itself as a mass in the neck and causes pain. In our research, we studied results of surgical strategies and necessity of surgical intervention.

Methods: We retrospectively evaluated 20 patients to our research who underwent surgery for glomus caroticum between dates of January 2006 and January 2013. 13 (65%) of them were female, 7 (35%) of them were male and the mean age was 47, 55 ± 12, 99 within the range between 24 to 74. According to Shamblin classification 5 (25%) patients were estimated group I, 12 (60%) patients were group II, 3 (15%) patients were group III.

Results: 90% of the patients were symptomatic and 10% of the patients were asymptomatic. The most common symptom on admission is unilateral mass in the neck (85%). The initial work-up was carotid doppler ultrasonography in 70% of cases. The definite diagnosis was made with MRI (45%), Carotid CT Angiography (40%) and cervical CT (10%). 9 patients (45%) had right sided, 9 patients (45%) had left sided and 2 patients (10%) had bilateral mass. All of the glomus caroticum tumors were resected subadventitially. External carotid artery ligation was performed in 2 patients and another 3 patients underwent reconstruction, while 2 of them had polytetrafluoroethylene interposition, the other patient had saphenous vein interposition. After surgical procedure, 3 patients had dysphagia, 2 patients had facial paralysis and 1 patient had difficulty in speaking. None of these complications were remained permanent. No post-operative short term mortality was found in our study.

Conclusion: Surgical intervention is still the most common treatment modality. The results are satisfactory after surgery. At the expense of causing possible neural and vascular complications, whole tumor mass should be resected cautiously.

Keywords: glomus caroticum, paraganglioma

OP-043

Surgical Excision of Carotid Body Tumour (CBT) Peshawar Experience

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Objective: To assess outcome in surgically managed carotid body tumour.
Methods: Retrospective study of 59 cases of carotid body tumour (CBT) from January 1994 to December 2010 at Department of Cardiovascular Surgery, Lady Reading Hospital, Peshawar Pakistan. Age, sex, clinical presentation, investigations, surgical excision and outcome analyzed regarding mortality and morbidity.
Results: 54.36% patients were female. Age ranged from 28 years to 57 years (mean age 36 years). All patients presented with pulsatile neck swelling. Carotid Doppler and Angio done in all patients. These patients divided into three groups according to Shamblin grading. There were 40 cases in Shamblin grade-I, 14 cases in Shamblin-II and 05 cases in Shamblin-III. All patients underwent surgery, however one had non-resectable tumour, which turned out to be malignant. There was no hospital mortality and no recurrence in excised tumour on 06 months to eight years follow-up. About 3.4% patients had cranial nerve deficits postoperatively. Permanent nerve deficit was significantly more in Shamblin grade-III group, while there was no significance in Vascular Reconstruction and temporary nerve deficit in the 3 groups.
Conclusions: Most of CBT are benign and resectable. Morbidity is mainly due to cranial nerve injuries, which is continue to be an important post operative complication, which may result in the reduction of the quality of patient's life. Smaller tumours of Shamblin Grade-I carries good results.

Keywords: carotid body tumour, excision, surgical

OP-044

Our Surgical Experience in Patients with Serious Carotis and Coronary Arterial Diseases

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Object: If carotis arterial disease is present in patients with coronary bypass grafting (CABG), risk of cerebrovascular event increases from 9% to 13% at older age. In patients with symptomatic carotid artery stenosis (80%), CABG/carotid pre-ACAS should be performed. Our surgical approach was that we first performed carotis endarterectomy (CEA) while patients were conscious, and 5–15 days later, CABG in cardiopulmonary bypass while the heart was beating.
Material-Method: From 70 patients admitted to Konya Training and Research Hospital between March 2009 and January 2013 with carotid artery disease, coronary angiography was performed in 24. After angiography, first CEA and then CABG were performed in these 24 patients.
Results: Nearly a third of patients had the history of previous stroke. Coronary angiography was conducted in 70 patients. In 24 patients (20 men, 83%; 4 women, 17%), coronary artery disease requiring revascularization was observed. Mean age was 69 (from 44 to 89). First subsequent CEA and then CABG were performed in all. No complication was developed after CEA, but transient ischemic attacks were developed in 8 after CABG; in 6 patients, ischemic attack was seen in the form of hemiparesis. Two patients with ischemic attack died. The two cases had prolonged ventilation and severe obstructive lung disease, and ejection fractions were lower.
Conclusion: Accompaniying carotis artery disease in patients treated with myocardialrevascularization is an important reason of stroke. Rate of stroke increase with an increase in the extent of carotis lesions. In order to decrease perioperative neurologic and cardiac complications to the lowest level in such patients, surgical strageties like approaches in single or two-stage sessions were reported. We performed CEA before CABG under local or servical. In contrast, we performed CEA under local or servical blockage not exposed to nonpulsatile flow of cardiopulmonary before CABG.

Keywords: carotis arterial disease, carotis endarterectomy

OP-045

Carotid Endarterectomy in Patients Intolerant to Cross-Clamping

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Objectives: A rare subgroup of patients with occlusive carotid artery disease is high-risk candidates for general anesthesia due to their intolerance to carotid occlusion even only for seconds without neurologic deficit. Even short duration of temporary clamping of the carotid arteries to deploy the shunt may be eventful in this particular patient group. We define safe carotid endarterectomy after insertion of a homemade carotid shunt in this particular patient population.
Methods: Among 65 patients whom underwent carotid endarterectomy between March 2010 and December 2012, five (7, 7%; three males, two females, age range: 56–77 years) could not tolerate carotid clamping. An alternative carotid shunt was used during the surgery of these patients.
Results: There were bilateral lesions in two patients, others had disease at one side. Degrees of stenosis were between 70–95%.

Temporary carotid clamping resulted in neurologic events, such as loss of consciousness in all and additional tremor in one, in less than 10 seconds (range: immediate to 8 seconds). All the patients tolerated the procedures well. Shunt flow was adequate in all and no neurologic deterioration occurred after carotid clamping. Mean carotid clamp time was 28.11 ± 14.19 minutes. Mortality did not occur. Patients are followed a mean of 9.3 ± 3.6 months, uneventfully.

Conclusions: A very rare subgroup of patients with carotid artery stenosis is not able to tolerate carotid occlusion, even for seconds during carotid endarterectomy for a regular marketed shunt insertion and called as intolerant to carotid occlusion. An alternative easily home constructible shunt made with an angiocatheter, three-way stopcock and serum line is an easily deployed shunt provides adequate cerebral flow and permits carotid endarterectomy.

Keywords: carotid artery disease, endarterectomy, shunt, purse string suture.

OP-046

A New Modification in Carotid Artery Endarterectomy by Longitudinal Arteriotomy from Common Carotid Artery to External Carotid Artery and Avoiding Shunt Application with Our Detailed Review of 419 Cases

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Objectives: In this study, we aimed to describe and compare a new modified eversion carotid endarterectomy technique. Our novel modification for this surgical procedure consisted of a longitudinal arteriotomy that was begun from the common carotid artery proximally to the origin of external carotid artery.

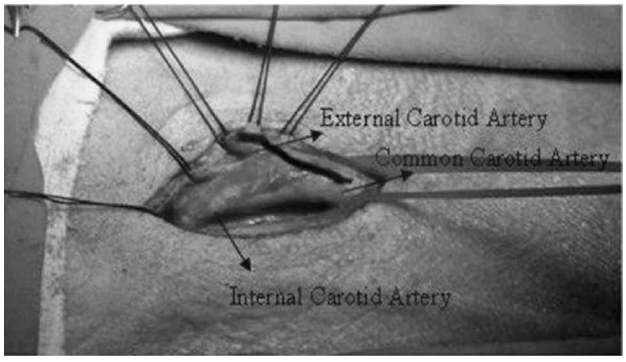
Methods: This multicenter study was derived from three different surgical centers for 419 cases in total. We performed our modification in 264 cases (Group A) among 419 carotid interventions. We also detailed and compared perioperative data among Group A and conventional carotid endarterectomy cases (Group B, n = 155).

Results: 7 patients from Group A and 4 patients from Group B died during the first postoperative week due to cardiac systolic insuffiency with multiorgan deficiencies. We recorded transient lingual deviation in 18 cases (4 from Group A and 12 from group B) and facial asymmetry in 24 cases (9 from Group A and 15 from Group B) which we believe to be related with N. Hypoglossus injuries. These postoperative complications were treated with intravenous and perorally steroids. Overall incidence of perioperative neurologic situation was 10% (42 cases in 419 patients). Besides, in 3 patients from simultaneous CEA and CABG group, we observed psychotic symptoms with delirium. In Group A, we maintained our postoperative controls at the postoperative 36th month after surgery in our first ten cases by dual computerized tomography angiography. We did not perform any patchplasty in this first control group during surgery. None of these patients presented a serious re-occlusion in CCA and ICA territories.

Conclusion: Modified eversion technique for carotid endarterectomy may decrease the incidence of patchplasy applications and postoperative re-stenosis by avoiding internal carotid artery manipulation and sewing. Besides, we believe that it is almost always easy and possible to remove plaques completely from internal carotid artery via our modified arteriotomy line.

Keywords: carotid endarterectomy, modified eversion technique, avoiding carotid shunt

Figure 1 Dissection of carotid system and black drawing representing arteriotomy



Specimen of removed atherosclerotic plaque

Operative data

Variable	Group A	Group B	P value
Op. length (minute)	51.5 ± 23.6	89.1 ± 11.7	p
Carotis crossclamp time (minute)	18.4 ± 7.9	NA	
Right side	154 (58.3%)	81 (52.2%)	p > 0.05
Left side	102 (38.7%)	66 (42.5%)	p > 0.05
Bilateral	8 (3%)	10 (6.4%)	p
Patchplasty	11 (4.1%)	16 (10.3%)	p

OP-047

Easy Way to Secure the Carotid Shunt

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[4]Muş Hastanesi

Shunts used during carotid endarterectomies are troublesome devices that easily come out the arteries during the make-or-break event.

We, here present a simple technic to secure the carotid shunt. A small purse suture is placed on a nonatherosclerotic side of the common carotid artery to insert the proximal part of the shunt. On clamping common and internal carotid arteries a small incision is made and proximal tip of the shunt is inserted thorough this purse suture. Then clamping the external carotid artery, the main incision for endarterectomy is made. Seeing that the proximal tip of the shunt is securely inserted into the common carotid artery, the clamp in the proximal part of this artery is released and the shunt is pushed more proximally and it's balloon is then inflated.Declamping the internal carotid, distal tip of the shunt is sent a few centimeters distally. The balloon of the distal part of the shunt is minimally inflated just enough to stop bleeding so that endarterectomy in a bloodless field can be achieved.

Keywords: carotid endarterectomy, carotid shunt, access

OP-048

Comparison of Treatment Results in Patients with Supraaortic Arterial Lesions Due to Takayasu's Arteritis According to the Treatment Modality and Disease Activity

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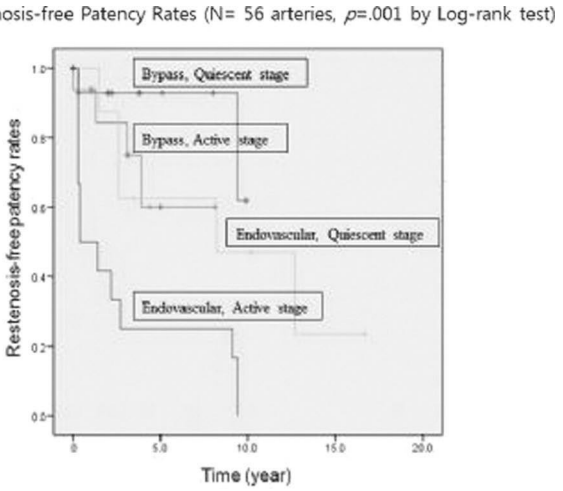
To achieve good result of surgical or endovascular treatment, it has been recommended that acute inflammatory stage should be avoided for patients with Takayasu's arteritis (TA). However, definition of acute inflammatory phase of TA has not been well established yet. Current criteria of acute inflammatory stage include various serum biomarkers, clinical symptom or signs, image findings of affected artery and surgical or histologic findings. Among those criteria, surgical or histologic findings are available only in patients who underwent open surgical treatment, therefore those findings are not helpful to make diagnosis of disease activity for patients not undergoing open surgical treatment.

Purpose: We attempted to compare results of surgical or endovascular treatment according to the preoperative serum ESR, CRP and CT angio or MRI findings in patients who underwent bypass surgery or endovascular treatment of supraaortic arterial lesions due to TA.

Method: During past 10 years, 260 TA patients were registered in cardiac and vascular center of Samsung Medical Center, Seoul, Korea. Among them, 28 patients were treated due to supraaortic arterial lesions, which included 19 surgical bypass (30 arteries) and 11 endovascular treatment (26 arteries). To determine acute inflammatory stage of TA, we used criteria of ESR >21 mm/hr, CRP >0.9 mg/dL, aortic or arterial wall thickening ≥2 mm with wall enhancement on CT angio or MRI. We calculated restenosis (>50%)-free patency rates of the treated arteries according to the disease activity at the presentation and treatment modalities.

Result: We found significantly big difference of restenosis (>50%)-free patency rates of treated arteries between treatment modalities (surgical bypass vs. endovascular treatment, p = .006 by Log-rank test) and disease activity (acute stage vs. quiescent stage, p = .001 by Log-rank test) of TA (Figure 1).

Restenosis-free patency rates



Conclusion: To achieve better result in TA patients affecting suprarenal aortic arteries, surgical bypass in a quiescent stage is recommended.

Keywords: takayasu's arteritis, treatment ouocome, bypass, endovascular procedure, cerebral revascularization

CASE PRESENTATION 1

OP-049

A Novel Temporary Endovascular Shunt Technique Assisting In Situ Fenestration for Total Endovascular Reconstruction of Distal Aortic Arch Vessels

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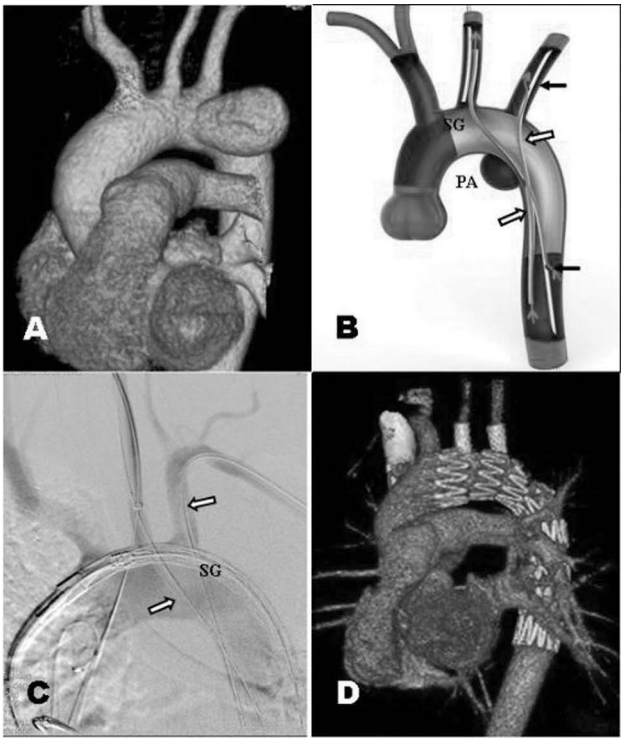
Thoracic endovasculr aortic repair (TEVAR) of arch pathology

presents special challenges of arch vessels revascularization. For the superiority of completely anatomic reconstruction of arch vessel, *in situ* fenestration (ISF) has been increasingly used in TEVAR, but allowed by necessary extra-anatomic bypasses of arch vessels. We report a case of successful TEVAR of a pseudoaneurysm at zone 2 in a 37-year-old man using ISF assisted by a temporary endovascular shunt (TES) technique. TES technique might be preferable to arch vessels bypasses for ISF.

Keywords: thoracic endovasculr aortic repair, *in situ* fenestration, temporary endovascular shunt

The fluoroscopic image for arch aneurysm exclusion during perioperative period and follow-up



A, computed tomography angiography (CTA) before TEVAR showing the eccentric pseudoaneurysm of zone 2. B, Schematic diagram of temporary endovascular shunt (TES). The pseudoaneurysm (PA) of zone 2 was excluded by SG. The descending aorta-left subclavian artery (LSA) TES (right hollow arrow) and the descending aorta-left common carotid artery (LCCA) TES (left hollow arrow) were established by using two 9F long sheaths with oval side ports (black arrow). The red arrows of red solid line indicate the direction of blood flow in the TES. C, The sheaths for TES (hollow arrow)were placed and delivery system containing a stent graft (SG) was advanced to zone 1. D, Six months follow-up CTA showing complete exclusion of the pseudoaneurysm and no endoleaks, patent LCCA and LSA.

OP-050

Lessons Learned from Endovascular Management of Ureteroarterial Fistula

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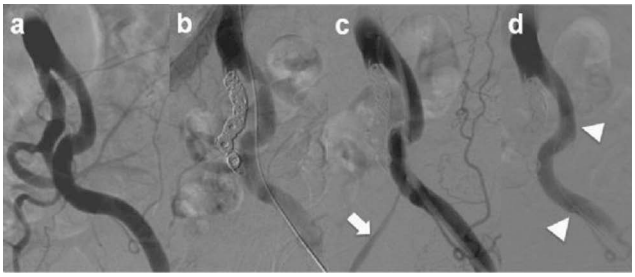
Purpose: To share lessons from endovascular management of ureteroarterial fistula (UAF).

Case: A-76 year-old female with history of hysterectomy, ureteral stenting, and radiation for cervix cancer suffered from UAF. During endovascular repair, we could not advance the 16-Fr delivery system of custom-made stent-graft due to very rigid iliac artery, even though the iliac artery diameter was large enough. Several attempts to advance the delivery system resulted in contrast extravasation from the middle portion of external iliac artery into the ureter (incidental provocative angiography). A smaller profile stent graft (9-Fr) was resolved the problems. At 22 months, there were no hematuria and complication.

Conclusion: Chronic inflammation results in unusual fistula site and rigid pelvic arteries which further leads to difficulty in advancing endograft delivery system. These suggested us to be prepared and to consider that angiography after inserting the delivery system could give additional information of exact fistula site.

Keywords: uretero-arterial fistula, rigid arteries, provocative angiography

Angiogram findings



(a) Angiography shows no contrast extravasation or irregular arterial wall. (b–c) Iliac artery could not be straightened even though by using an ultra-stiff guide wire and incidental provocative angiography shows contrast extravasation (arrow) into the ureter from the middle portion of EIA. (c) After stent-graft placement, arrow heads show proximal and distal edge of the stent-graft.

OP-051

Application of Intrahepatic Collateral Vessels in Interventional Therapy for Segmental Occlusion of the Inferior Vena Cava in Budd-Chiari Syndrome

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Department of Endovascular Thearapy and Interventional Radiology

Treatment of long segmental occlusion of the inferior vena cava (IVC) in Budd-Chiari syndrome (BCS) remains challenging. IVC segmental occlusion in BCS is often associated mainly with hepatic vein lesions in BCS, while the accessory hepatic vein (AHV) is typically patent and more intrahepatic collateral vessels are widely well-developed. Herein, we report our use of angioplasty for hepatic venous or the accessory hepatic vein for long segmental occlusion of the IVC in BCS, rather than opening the IVC, in cases with a well-developed intrahepatic collateral. This method provides satisfactory outcome, and is practical and feasible.

Keywords: intrahepatic collateral vessels, budd-chiari syndrome, interventional therapy

OP-052

Endovascular Treatment of Total Aortoiliac Occlusion (TASC II Lesion) with Critical Limb Ischemia in Patient with Hostile Groins

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The Total Aortoiliac Occlusion is a variant of Trans-Atlantic Inter-Society Consensus (TASC) type D aortoiliac disease. Surgical bypass is the treatment of choice so far.

Case 1: However, new endovascular devices and stents has expanded the role of endovascular treatment technique in more extensive aortoiliac occlusive disease in patient with hostile groins.

Case 2: Fifty seven year old man presented with unhealing ulcerative wound on the right thigh and calf after failed prior open thrombectomy. He underwent emergent femoro-posterior tibial artery bypass and open thrombectomy because of acute limb ischemia with popliteal artery occlusion 3 months ago. He has a history of 20 years' medication of hypertension. Otherwise unremarkable. He has hostile groins due to previous operation scars. Bilateral femoral arteries were accessed by ultrasound guided needle puncture. Left axillary artery access was done with cutdown methods. The chronic total occlusion of aortoiliac lesion (Fig. 2A) was recanalized with Cobra catheter and 0.035 wire. Under the fluoroscopy, stent grafts (Viabahn) were inserted to aortoiliac lesion successfully. Both femoral access were closed with fascial closure technique. He underwent a skin grafting in right thigh and calf in 2 weeks. The wound was healed (Fig. 1B) and the patient discharged. The stent graft is patent in 6 months' follow up. Total aortoiliac occlusion can be treated by endovascular treatment in patient with hostile groins.

Keywords: aortoiliac occlusion, endovascular treatment, TASC D

OP-053

The Double-Elephant Trunk Technique Promotes Simultaneous Perfusion into the True and False Lumens in Repair of Chronic Dissecting Aortic Aneurysm

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Excise of a generous portion of dissecting septum to provide equal blood flow into both true and false lumens is recommended in repair of chronic dissecting aortic aneurysm. However, one of the dissecting lumen might collapse due to unequal distal perfusion, which may cause organ mal-perfusion. Herein we report two cases of chronic dissecting aortic aneurysm. In both cases we avoided serious complications by using "double-elephant trunks technique" to perfuse forward flow into true and false lumens simultaneously.

Keywords: aortic dissection, aortic aneurysm, surgical technique

OP-054

Diagnosis and Management on Primary Vascular Neoplasms

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Objective: Primary vascular neoplasms are rare entities. This retrospective study aims to study the diagnosis and management on primary malignant tumor originating from great and medium artery walls.

Methods: The clinical data on 3 cases with malignant tumors originating from great and medium artery walls were retrospectively analyzed in a single-center hospital between 1993 and 2013.

Results: Three cases were included: one case with abdominal aortic undifferentiated intimal sarcoma, one case with descending aortic leiomyosarcoma, one case with right common carotid artery inflammatory myofibroblastic tumor. All the 3 cases were scanned with computer tomography angiography (CTA) before operations; however none of them were properly diagnosed. They were suspicious with malignant tumors based on the samples during the operation, and confirmed with pathological findings

post operations. All the 3 cases were operated with tumor incision and transplanted with grafts. One case with abdominal aortic undifferentiated intimal sarcoma died in 6 months post operations. The other 2 cases are still alive.
Conclusions: Preoperative imaging study should be improved for the precise diagnosis on primary vascular neoplasms.

Keywords: primary vascular neoplasm, diagnosis, computer tomography angiography, treatment

OP-055

Intravenous Leiomyoma with Intracardiac Extension

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Introduction: Leiomyoma is benign uterus smooth muscle cell neoplasm. However, it is characterized by a proliferation into pelvic veins and inferior vena cava (IVC). Currently, 300 cases of intravenous leiomyoma have been reported, and only 100 of them have intracardiac extension. We present a case of intravenous leiomyoma originating from uterus with an extension through IVC into right atrium and its surgical treatment with beating heart technique on single-session.
Case: 49-year-old female patient was put on warfarin regimen with diagnosis of intravenous thrombus originated from right internal iliac vein and extended into the inferior vena cava 9 months ago at another clinic. She was admitted to our clinic with persistent complaints of intermittent dyspnea, palpitation and dizziness. Computed tomography angiography revealed an intraluminal filling defect located in the right paraovarian area, boundaries were not distinguished from uterus and starting from right internal iliac vein and extending into IVC.

Transthoracic/transesophageal echocardiography revealed a large mass in the right atrium and the para-cardiac portion of IVC. Cardiac surgery were decided first after consultation with obstetric and gynecology department. A mass with 25 cm and 186 gr was excised through right atrium on beating heart with support of the pump. Histopathological assessment of mass was compatible with intravenous leiomyoma.
Conclusion: Clinical signs and symptoms of leiomyoma are related with size and localization of tumor. Because of the rarity and unusual growth potential of intravenous leiomyoma, several diagnostic tests such as echocardiography, computed tomography angiography, venography, and magnetic resonance imaging should be used to prevent delay in correct diagnosis and extension. There is still controversy about the exact timing and surgical strategy, especially in presence of intracardiac extension. Surgical strategy should be tailored according to the patient's complaints following precise localization tumor without delay. High rate of recurrence should also be kept in mind.

Keywords: leiomyoma, intravenous, intracardiac extension

OP-056

Secondary Artoenteric Fistula Related to Graft Infection, A Case Report

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Aim: The aorto-enteric fistula (AEF) is a hazardous disease that needs immediate diagnosis and surgical treatment to save patients. The mortality rate after surgical treatment is from 14% to 70%. We experienced a case of secondary AEF that was successfully discharged from our institute with early diagnosis, immediate surgical in situ repair and adequate antibiotic use.
Material-Methods: A 68-year-old male was referred to our institute for bloody bowel discharge. He had diabetes mellitus and was performed infrarenal aortic aneurysm graft replacement about 3 month ago at another institute. When he arrived at our institute, he had shock vital signs. We diagnosed AEF by CT and did emergency operation. The operation was performed mid abdominal incision. The proximal site of aorto-graft anastomosis made pseudoaneurysm with abscess formation and this and duodenum and jejunum had direct communication. We removed almost all infected graft and reimplanted rifampicin absorbed new vascular graft *in situ*. Inferior mesenteric artery was revasculized but bilateral internal iliac artery revasculization was impossible by severe adhesion. The results of blood culture and abscess around graft were MRSA and E.coli.
Results: Postoperative day 2, we performed second look operation for observation of large intestine and peritoneal lavage. Descending colon and rectum had patchy necrosis so we performed Hartmann's operation. We rapped new vascular prosthesis with greater omentum at the same time. Postoperative day 28, we made A–V fistula for end stage renal disease due to long time renal ischemia. Postoperative day 50, the patient discharged from our institute on foot.
Conclusions: Bleeding of gastrointestinal tract in a patient with a history of intra-abdominal aortic reconstruction surgery must raise suspicion of AEF. The way of reconstruction, in situ or extra-anatomical, is controversial.

Keywords: secondary aortoenteric fistula, pseudoanuerysm, aortic graft infection

OP-057

Emergency Endovascular Treatment for Latrogenic Iliac Artery Injury Due to Lumbar Microdiscectomy

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Vascular injuries are rare (estimated incidence <1%) but highly mortal complications of spinal surgical procedures. Perforation of a major vessel may lead to massive hemorrhage and hypovolemic shock in a very short period of time so prompt detection of the injury has crucial importance.

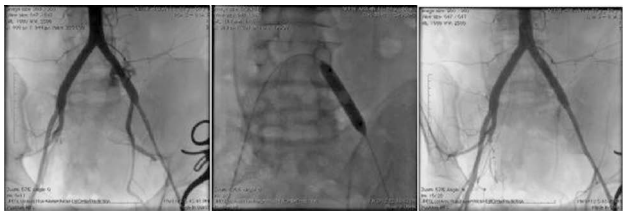
Our case was a 51 years old women subjected to lumbar microdiscectomy for L4 and L5. Decrease of hematocrit level and hypotension was detected on postoperative follow ups and a CT scan revealed hemorrhage in the retroperitoneal space.

Patient was taken to the cath lab immediately, angiography showed extravasation of blood from left common iliac artery, an aortic balloon catheter was inserted and inflated in the injury site to prevent leakage while preparations were made. Left common femoral artery was prepared and a covered stent graft (Endurant TM stent graft, Medtronic, Inc., Minneapolis, MN) was inserted to the left common iliac artery. Repeat angiography showed no leakage. Patient was discharged without any complication on third postoperative day.

Traditional treatment of vascular injuries following spine surgery was open surgical repair until last decade. In the endovascular interventions era, angiography is not only the gold standart modality of diagnosis but also the mainstay of the treatment in most of the cases. Rapid intervention with minimal invasiveness make endovascular treatments preferable over open surgery while it's still the last but not the least option in such emergent situations.

Keywords: vascular injury, endovascular, stent, lumbar discectomy

Angiography



A. Extravasation of blood B. Balloon inflation C. Stent, no extravasation of blood

OP-058

A Case with Late Penetration of a Prophylactic Inferior Vena Cava Filter Into the Aorta

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Venous thromboembolism is a common disease, which is associated with significant morbidity and mortality. Pulmonary embolism (PE) is best prevented by anticoagulation management. However, when warfarin and heparin are contraindicated or ineffective, in patients at high risk for major bleeding, placement of an inferior vena cava (IVC) filter may be considered to be an appropriate management. Nevertheless, insertion of IVC filters is associated with clinically significant complications, such as IVC thrombosis, IVC perforation, or penetration to adjacent organs.

We report a case of an 83-year-old man in which placement of an IVC filter resulted in a late complication of penetration into the aorta by the hook of the filter.

Keywords: IVC filter, complication, penetration

OP-059

Closure (Embolisation) of High Flow Renal Arterio-Venous Fistula

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Arteriovenous fistulas (AVFs) in the kidney are relatively uncommon lesions. Approximately 70% are acquired iatrogenically during renal biopsy, through blunt or penetrating trauma, inflammation, tumor or renal surgery. Another 25% are congenital, arising from errors in vascular morphogenesis. About 5% have no apparent cause and are thought to result from venous erosion of an arterial aneurysm.

We discuss the case of a 63 year old woman who was admitted with acute right flank pain and tachycardia. She had right mid-quadrant tenderness and a high-pitched pansystolic bruit over the right flank. Ultrasound scan showed two heterogenous lesions on the upper pole of the right kidney with features of Renal AV fistula. CECT abdomen was done to further delineate the lesion and it revealed a high flow AVM with aneurysmal dilatation of the entire extent of the renal artery and vein.

Percutaneous embolization of the AVM using an Amplatzer vascular Plug was performed via the left brachial route and the

final angiogram documented a complete occlusion of the fistula. The patient was discharged satisfactorily and is currently on regular follow up.

Endovascular treatment is now the standard of care for both congenital and acquired renal fistula. Various vascular devices have proved effective, but vascular plugs are a one-step, easy procedure that results in precise, reliable, cost-effective and total occlusion of the target vessel in various vascular territories. However, long term studies are yet awaited to determine the long term role of AVP (Amplatzer Vascular Plug) as a vessel occluder.

Keywords: renal A.V. fistula, vascular plug

CASE PRESENTATION 2

OP-060

Open or Endovascular Repair of an Abdominal Aortic Aneurysm in Patient with Horseshoe Kidney

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Aim: Horseshoe kidney (HSK) is a common renal complication, and unusual abnormality occurring in 0.1–0.25% of the general population. The coexistence of abdominal aortic aneurysm (AAA) with HSK is rare. The patients with HSK of 0.12% are undergone aneurysm replacement. The presence of HSK may complicated an anterior approach to reconstructive surgery of aorta and iliac vessels, because the isthmus of the HSK lies across the aorta and HSK had anomalous renal vessels.

Technical problems related to exposure, vascular access and preservation of renal tissue. The HSK has a variant arterial supply in the majority of patients with accessory renal arteries arising from the aorta or iliac arteries. Since the surgical approach is challenging and has a high risk of complications, Endovascular repair seems to be an attractive alternative.

Material and Methods: We report two cases of successful reconstruction of the aorta in patients with Open and Endovascular repair without reconstructing accessory arteries. We describe our experience in the successful treatment of patients who had the coexistence of AAA with HSK.

Our preoperatively practice is to perform spiral CT angiography (CTA) for assessment for all aneurysms. The isthmus of HSK and accessory renal arteries were identified. Since accessory renal arteries were a diameter smaller than 3 mm and Main renal artery was with a diameter larger than 6 mm. Therefore we planned to the surgical repair without reconstructing accessory renal arteries.

Postoperatively Renal function remained normal and the patients made an uneventful recovery.

Results and Conclusion: The patient had accessory arteries originating from the aorta. These vessels supply a variable volume of renal parenchyma. There was no less of renal tissue following contract CT with the patient. These cases demonstrate that accessory renal arteries in patients with HSK are not necessarily end arteries. Their preoperatively careful analysis is essential for rational treatment.

Keywords: horseshoe kidney abdominal aortic aneurysm endvascular stent

OP-061

Usefulness of MILLER Banding Procedure for the Dialysis-Associated Steal Syndrome or the Central Venous Stenosis: Report of Two Cases

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Introduction: Flow volume reduction by banding of outflow vein is one of optional treatment of steal syndrome and central vein stenosis. Minimally Invasive Limited Ligation Endoluminal-Assisted Revision (MILLER) banding procedure is a precision inflow banding procedure to limit vascular access flow under the angiography and minimal incision. We had two cases of MILLER banding procedures. One was for steal syndrome and the other was for central venous stenosis. We're intend to report the two successful cases of MILLER banding procedure.

Case Presentation: (1) 76-year-old woman got a Lt. brachiocephalic AVF (BCAVF) formation 5 months ago and A balloon-assisted maturation after 6 wks from the operation developed steal syndrome. A duplex scan at 3 wks later showed well maturated state of fistula; 7.28–7.56 mm of outflow vein in diameter and 800–880 ml/min of outflow volume. But, the ischemic symptom had worsen especially during the hemodialysis. The MILLER banding procedure was done successfully resulted in the reduction of outflow volume to 600–700 ml/min. Her ischemic symptoms was changed from grade III to grade I with disappearing of pain in dialysis.

(2) 58-year-old man have a 8 yrs old Lt. Radiocephalic AVF (RCAVF) and the Lt. subclavian venous stenosis which had got 3 times of angioplasty every 4 months from December 2012. For the symptomatic treatment, we tried the MILLER procedure. The diameter of juxta-anastomosis of the RCAVF was 3.67 mm in the fistulography and the diameter of outflow vein 4 cm apart from the anastomosis was 7.16 mm which was reduced by 4.08 mm

after the MILLER procedure. Also, the outflow volume was reduced from 930 ml/min before the procedure to 730 ml/min and the Lt. arm edema was improved more with disappearing redness and dullness.

Conclusion: The MILLER banding procedure would be a non-invasive and effective procedure for the steal syndrome and the central venous stenosis in dialysis patients.

Keywords: MILLER banding procedure, banding, steal syndrome, central venous stenosis, central vein stenosis

OP-062

Aortic Occlusive Disease with Horseshoe Kidney with Thrombosed Infected Extra-Anatomic Bypass—A Case Report

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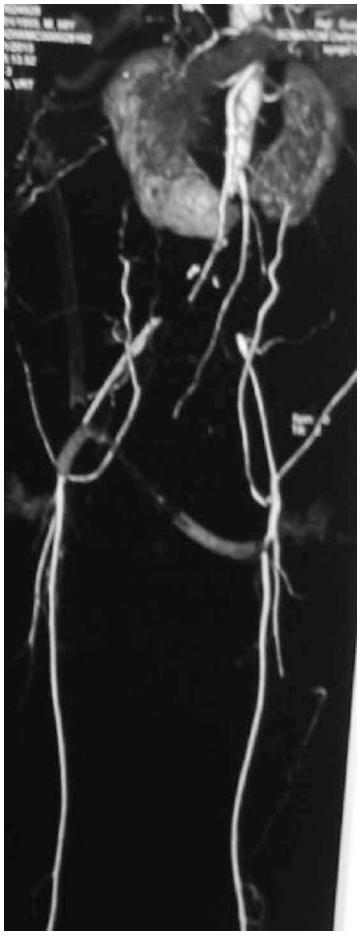
Figure 1



Juxta renal Aortic occlusion with horseshoe kidney

Introduction: A case of Juxtarenal aortic block with horseshoe kidney with thrombosed, infected extra anatomic bypass graft a rare and complex case to handle. Planned surgery remains the only option.

Materials-Methods: A 58 year old male hypertensive, smoker, presented with pain in both legs after walking a distance of 75 m without h/o rest pain or neurological deficit. Operated for a diagnosis of PAD with axillo-bi-femoral bypass 18 months back in other hospital. After an asymptomatic interval of 6 months he developed discharging wounds on abdominal wall and groin, with graft infection. Referred after failed medical treatment to AIIMS.

Examination: Multiple infected wounds along the graft tract from right axilla to both groins with non functional graft extrusion seen through it. ABI was 0.4 on both limbs with absent all peripheral pulses. CT angiography suggestive of Juxta renal aortic occlusion with distal reformation at the level of SFA in both legs with blocked graft and Horse shoe kidney with a pair of aberrant renal arteries. Patient underwent removal of infected graft and after settlement of infection underwent the definite procedure of aorto-bifemoral bypass procedure with aortic clamp between two pair of renal arteries. Proximal anastomosis behind the undivided isthmus using Dacron graft with clamp time of 35 min.

Results and Discussions: Recover uneventful with 6 months followup. Extra-anatomic bypass surgeries are indicated only in conditions in which anatomic bypass cannot be performed. Graft infection management is challenging. Proper planning includes studying anatomy, clamping time and management of the horseshoe isthmus.

Keywords: aortic occlusion, horseshoe kidney

MISCELLANEOUS 1

OP-063

Training and Accreditation in Vascular Surgery and Endovascular Surgery. Saudi Arabia and GCC Countries

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Vascular Surgery practice and education vary widely across the globe. There is an international movement towards independent Vascular Surgery certification with longer vascular surgery specific training, but shorter overall residency duration. Countries with independent vascular surgery certification produce more trainees per year to deal with the increased burden of cardiovascular diseases and to serve the growing elderly population.

Almost every country has its own vascular surgery program. Most curricula of vascular surgery training are composed of Basic Vascular Surgery Research, Clinical Vascular Medicine, Vascular Investigation, Open and Endovascular Surgery with period of training ranging from 2–4 years.

Saudi Arabia the largest and most populated of GCC countries, in

year 2000 started Vascular Surgery Training program at King Khalid University Hospital Riyadh under King Saud University "King Saud University Fellowship in Vascular Surgery" having prerequisites, curricula and training comparable with most other countries in the world.

Aim to achieve a free exchange of training and work in Vascular Surgery between all GCC member countries and to have a unified fellowship program in Vascular Surgery comparable to international standards—"GCC Board of Vascular Surgery".

Keywords: vascular training

OP-064

Dikmengil-Yilgör TF 1-2-3 Vascular Grafts (In Vitro Dilatation Resistance Results)

*Murat Dikmengil[1], Iskender Yılgör[2], Mustafa Haluk Akbas[1], Ilhan Mavioglu[1], **Ekin Ilkeli[1],** Tarhan Çınar[1], Recep Özmerdivenli[3]*

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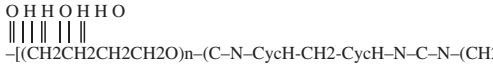
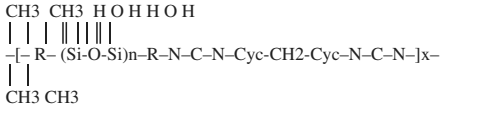
[3]Düzce University Physiology Department

Dikmengil-Yılgör TF 1-2-3 grafts are produced to reach some properties of vascular grafts which are known as dilatation resistance non-thrombogenesity, elasticity, durability, impermeability, non-toxicity, good manipulability, good handling, good tailoring characteristics, safe implantation, reduce of the operation time,



Polyether soft segment Urethaneurea hard segment

Average molecular weight of polyether soft segment: 2000 g/mol
Average molecular weight of urethaneurea group: 850 g/mol
Average overall molecular weight of the polymer: 50,000 g/mol
Urethaneurea hard segment content: 30% by weight
Structure of silicone-urea additive for surface modification:



reduction of blood oozing, resistance to body heath, reduced inflammatory reaction.

Dikmengil-Yilgör TF 1-2-3 have an innovative configuration and a special chemical wall sturucture aiming the augmentation of blood flow and trying to prevent the cloth formation.

Polyether based poliurethanurea graft chemical sturucture and specialities:

Polydimethylsiloxane Urea hard segment

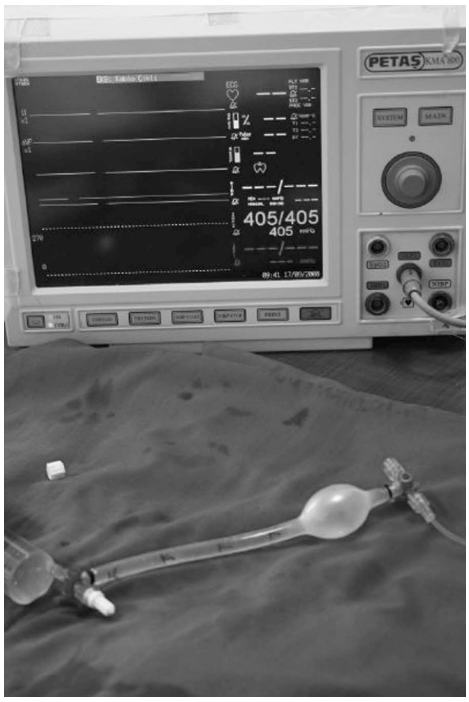
soft segment

Average molecular weight of polydimethylsiloxane soft segment: 3200 g/mol

Average molecular weight of urea group: 260 g/mol

Average overall molecular weight of the polymer: 50,000 g/mol

Dikmengil-Yılgör TF-1 anevrism at 405 mmHg pressure



Dikmengil-Yılgör TF-1 vascular graft kept its shape untill 405 mmHg and above this value an anevrism of 20.4 mm diameter occured

Urethaneurea hard segment content: 7.5% by weight

Dikmengil-Yılgör TF 1-2-3 are tested for strength on a continious pressure systheme which is consisting of a saline injector, a tri-flow tab and a monitor. The tree different grafts are tested separatly. The results showed that Dikmengil-Yılgör TF1 keep the stability untill 430 mmHg and result with anevrism formation of 20, 4 mm diameter Dikmengil-Yılgör TF-2 has not change the formation untill 420 mmHg and give an anerismatic dilatation of 20, 4 mm diameter at this pressure. Dikmengil-Yılgör TF-3 has show no change untill 430 mmHg pressure and end with anevrism formation of 30.2 mm diameter at this pressure.

No rupture, no leakage occured Dikmengil-Yılgör TF1-2-3 grafts are still under in-vitro examinations for the others properties.

Keywords: graft, vascular prosthesis, synthetic vascular grafts, bypass grafts

OP-065

Cardiac Biomarkers in Non-Cardiac Ischemia

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Medical School of Dicle University

Objective: Biochemical markers are important for the timely

diagnosis and follow-up of ischemic events. Most of the markers have been previously studied in the context of cardiac ischemia. However, research on markers of non-cardiac events is insufficient. Therefore, we investigated the relationship between troponin and myoglobin, both of which are commonly used markers of cardiac ischemia, in non-cardiac ischemia.

Method: Forty-eight rats were divided into six equal groups. The first group was the control group. The second group was the sham group and received a simple laparotomy. The superior mesenteric artery was clamped in groups three and four in order to create mesenteric ischemia. The left femoral artery was clamped in groups five and six in order to create peripheral ischemia. Intracardiac blood samples were taken from all groups (during the 3rd hour of ischemia in groups III and V and the 6th hour of ischemia in group IV and VI) and troponin T and myoglobin levels were measured in the blood samples.

Results: Troponin and myoglobin levels were statistically similar in groups I and II. Moreover, increments were detected both troponin and myoglobin in ischemia groups according to group I and II. Furthermore, the highest troponin levels were detected after three hours of mesenteric ischemia and the highest myoglobin values were observed after six hours of mesenteric ischemia ($p < 0.05$).

Conclusion: Troponin T and myoglobin are not specific for non-cardiac ischemia, and they may be useful for detecting other ischemic events when positive.

Keywords: cardiac biomarkers, troponin T, myoglobin, mesenteric ischemia, peripheral ischemia

OP-066

Management of Large Malign Tumors Associated with Major Vascular Structures in Extremities; Role of Vascular Surgery

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Aim: Surgery of the limb malign tumors, there were no difference between amputation to wide resection about mortality and morbidity. With attendance of vascular surgeon to the surgery team, cases which are not suitable for limb salvage surgery can be operated succesfully.

Materials-Methods: Tumors are located at thigh in 34 patients, at arm in 7 patients, at inguinal region in 4 patients and at cruris in 3 patients. Contralateral reverse saphen vein was preferred as bypass graft. Ring formed PTFE graft was used in patients who have insufficent quality and calibre saphen vein at preoperative USG evaluation.

Results: As vascular surgery; vascular separation with primer dissection was made to 32 patients, vascular repairment was made to 6 patients, artery and/or vein ligation was made to 6 patients, anatomical bypass was made to 4 patients (2 otogen reverse saphein vein, 2 ringed PTFE). (Datas and findings of patients are summerized at Table 1.)

Conclusions: Rough finger dissection of vascular structures beneath to tumor tissue by orthopedics surgeons can be responsible from serious vessel injuries. Especially in recurrent cases adhesions of the peritumoral tissues have to be dissected finely and sharply. With the attendance of vascular surgeon surgical comfort raises. With bypass techniques, although major conduit artery was encased by the tumor now amputation is not the only choice. Doppler USG give us more detailed and dynamic datas such as; vascular calibre changes due to tumor compression, tumoral encasement percentage of vessel and saphen vein evaluation.

Relation of the tumor and the main vessels of lower extremity

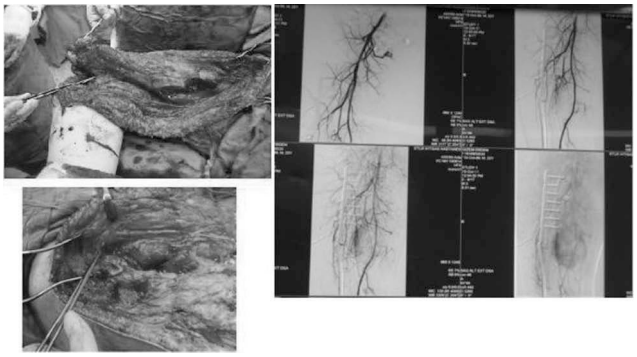

Table 1. Datas and findings of patients

Patients		
	Male	46 (54, 2%)
	Female	22 (45, 8%)
Mean age	36 (3–72) years	
Tumors	Primary 18 (37, 5%)	
	Recurrence	20 (41, 6%)
	Metastatic	10 (20, 9%)
Pathologic diagnose	Osteosarcoma	11 (22, 9%)
	Malign mesanchimal tumor	9 (18, 7%)
	Epidermoid carcinoma	7 (14, 5%)
	Synovial sarcoma	7 (14, 5%)
	Condrosarcoma	6 (12, 5%)
	Ewing sarcoma	5 (10, 5%)
	Liposarcoma	3 (6, 2%)
Tumor surgery	Wide resection	43 (89, 5%)
	Debulking	5 (10, 5%)
Primary graft patency (n = 3)	75%	
Early mortality	1 (due to intraoperative bleeding, massive transfusion)	
Re-exploration	6 (due to bleeding)	
Embolectomy	1 (due to early synthetic graft thrombosis)	
Follow up	434.7 ± 317.6 (1–1005 days)	
Long term follow up	Complete remission	17 (35, 4%)
	Death due to malignancy	13 (27, 1%)
	Progressive disaese	6 (12, 5%)

If we compare our outcomes with the amputation cases in literature, although most of our patients have recurrent disease, we didn't see any differences by the means of mortality and metastasis rates. According to us contribition of vascular surgeon to the team lead to more successfull results in limb salvage surgery.

Keywords: limb malign tumors, vascular surgery, limb salvage surgery

MISCELLANEOUS 2

OP-067

Vascular Trauma in Civilian Practice Experience at Peshawar Pakistan

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Aim: To evaluate vascular trauma management mainly on clinical assessment, at a less equipped set-up and compare the outcome in early and late presented patients.

Method: A prospective study of vascular trauma patients at Lady Reading, Peshawar. The nature, site, early and late presentation and outcome of surgery in vascular injuries presenting to our department between January 1995 to December 2007 were assessed. Out of these cases, only few stable neck injuries had pre-operative angiographies. There were 2041 vascular injuries in 1952 patients (mean age 29, range 3–71 years). Mechanism and nature of injuries were assessed. Early presentations (group A: 667 cases <8 hours) were compared with late presentations (group B: 1285 cases >8 hours). The hospital mortality, complication, associated injuries and outcome were assessed.

Result: Male accounted for 90% of patients. The majority of injuries (79.85%) were caused by bullets, followed by stab injuries (7.35%), blunt trauma (8.75%) and Iatrogenic (3.38%). 62.74% were arterial, 11.35% were venous, 24.10% were mixed, 2.11% had intact vessels. Upper limb injuries were 31.63%, lower limb (60.16%), remaining were neck or abdominal injuries. Associated injuries included fractures (16.38%), nerve injuries (25.42%), chest injuries (5.93%), abdominal (9.03%) and cervical spine or head injuries (1.41%). About 70% presented with hemorrhage and 80% with pulse deficit. Injuries treated with end-to-end anastomosis (44%), vein graft (21.46%), prosthetic graft (6.98%), lateral suture (16.66%), ligation (5.36%), thrombectomy (4.51%) and primary amputation (2.25%), Group "A" had higher mortality than group "B" (16% vs. 5%) with amputation rate of (7.86% vs. 10.48%) and infection rate of (32% vs. 14.65%).

Conclusion: The higher mortality in those arriving within 8 hours of injury reflects, their more severe injuries. Early recognition and prompt referral to vascular surgery centre may save life and limbs in vascular trauma patients.

Keywords: vascular, trauma, arterial, venous, injuries

OP-068

Prescribing Patterns of Antithrombotic Therapy for Lower Extremity Endovascular Procedures and Venous Thromboembolism Management in Mainland China

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[2]Institute of Vascular Surgery, Fudan University, Shanghai, China

Background: The use of antithrombotic agents in vascular disease is a common clinical practice despite a lack of clear convincing evidence. The goal of this study was to explore prescribing patterns of antithrombotic drugs among vascular surgeons in China.

Methods: Attendees at a national vascular surgery meeting (CEC2012 with a attendance of 1453 vascular physicians) were asked to complete a voluntary survey indicating their prescribing patterns of antithrombotic drugs in patients undergoing infrainguinal endovascular procedures or suffering venous thromboembolism (VTE).

Results: A total of 155 valid responses were gathered, of which 80.6% were submitted by vascular surgeons. 93.5% of the responses were from physicians practicing in tertiary hospitals covering 25 provinces in China. For VTE prophylaxis, 80.0% of respondents would prescribe anticoagulation to high-risk surgical patients. For VTE therapy, 76% of responding physicians would utilize extended bed rest strategy, and 77.4% would prescribe anticoagulation, of whom 11.2% would treat the patients for 3 months. The hospitals where the respondents practice had median monthly infrainguinal endovascular procedures of 21 (interquartile 13–41) cases. The rates of initial postoperative use of single, dual or triple antithrombotic treatment were 8.4%, 72.3% and 11.7% respectively. Among the latter two treatments, 65% of respondents would ultimately transfer to aspirin alone. Finally, 40.3% of respondents would adopt a life-long antithrombotic strategy. Cilostazol (63.4%) and prostacyclin analogue (61.4%) were the most commonly used adjunctive drugs prescribed following endovascular procedures. Proactive interventions against smoking cessation, hyperlipidemia and diabetes were offered by 90.2%, 80.5% and 77.3% respondents respectively.

Conclusions: For VTE management, antithrombotic agents are chosen properly by most vascular surgeons in China, but the treatment duration is highly variable. Following infrainguinal endovascular procedures, a relative high proportion of combined antithrombotic therapy and low proportion of life-long antithrombotic therapy are prescribed.

Keywords: antithrombotic, antiplatelet, endovascular, venous thromboembolism, peripheral arterial disease

Table I Antithrombotic therapy after infrainguinal endovascular procedures

Antithrombotic strategies*	Dosage switching point				Therapeutic duration						Total
	1 mo	3 mo	6 mo	12 mo	1 mo	3 mo	6 mo	9 mo	12 mo	24 mo	Lifelong	
Single antiplatelet treatment												
ASA or clopidogrel alone	N/A	N/A	N/A	N/A	0	3	1	1	0	0	8	13
Dual antiplatelet treatment												
ASA/clopidogrel same duration	N/A	N/A	N/A	N/A	2	4	9	0	5	9	16	45
Clopidogrel with background ASA	5	27	24	11	0	2	11	0	19	9	26	67
Anticoagulation treatment												
VKA alone	N/A	N/A	N/A	N/A	0	0	1	0	0	0	3	4
VKA with background ASA	2	2	3	0	0	0	0	1	1	0	5	7
Triple antithrombotic treatment												
VKA/ASA/clopidogrel same duration	N/A	N/A	N/A	N/A	0	1	1	0	1	0	2	5
VKA/clopidogrel with backround ASA	2	3	6	0	0	0	4	0	5	1	1	11
VKA with background ASA/clopidogrel	1	0	1	0	0	0	0	0	1	0	1	2

**One respondent indicated only cilostazol was prescribed.*

OP-069

Clinical Results of Denatured Human Umbilical Vein Prosthesis: A Systematic Review and Meta-Analysis of Comparative Studies

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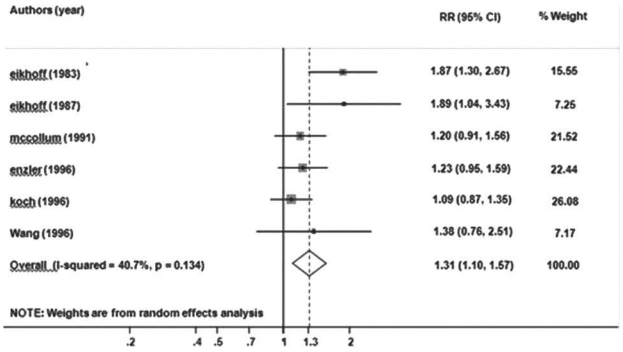
Aims: Biosynthetic prosthesis (BP) has been reported as a safe alternative to polytetrafluoroethylene (PTFE) in vascular reconstruction. However, efficacy of BP remains controversial. We, therefore, conducted a systematic review to summarize previous available evidences comparing the BP and PTFE in terms of clinical outcomes.

Methods: A literature search of the MEDLINE and Scopus was performed to identify comparative studies reporting outcomes of BP, PTFE, and autologous veins graft (VG) in peripheral vascular reconstructions. The outcome of interest was graft patency. Two reviewers independently extracted data. Meta-analysis with a random-effect model was applied to pool a risk ratio (RR) across studies.

Results: Among 584 articles identified, 7 studies (4 randomized controlled trials (RCT) and 3 cohorts) comprising 1,343 patients were eligible for pooling. Six studies compared BP with PTFE and 3 studies compared PTFE with VG. Among BP vs. PTFE, pooling based on 3 RCTs yielded the pooled RR of 1.54 (95% CI: 1.10, 2.16), indicating 54% higher graft patency in VG than PTFE. Adding the 3 cohorts in this pooling yiled similar results with the pooled RR of 1.31 (95% CI: 1.10, 1.57) (Figure 1). The pooled RR of graft patency for BP vs. VG was 0.75 (95% CI, 0.54, 1.06), indicating 25% lower graft patency but not significant in BP than VG.

Conclusions: Our first meta-analysis indicated that the biosynthetic prosthesis might be benefit over PTFE by increasing graft

Figure 1. Meta-analysis comparing graft patency between BP and PTEF



We hope that abstract suitable to present in 14th Congress of Asian Society for Vascular and 16th Congress of Turkish Society for Vascular and Endovascular Surgery and 8th Asian Venous Forum

patency. An updated meta-analysis or a large scale randomized control trial is required to confirm this benefit.

Keywords: biosynthetic prosthesis polytetrafluoroethylene graft patency

OP-070

The Immediate and Delayed Consequences of Vascular Injuries of Extremities

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Aim: To share our experience of dealing with immediate and delayed consequences of vascular injuries of extremities in a tertiary care center in Karachi, Pakistan.

Material and Method: 11-years (2002–2013) retrospective study was carried out and all the cases were studied to see the outcome who presented with vascular injuries within the:

1. Duration of less than 8 hours.
2. Between 8–15 hours.

Patients with more than 15 hours of presentation and in whom primary amputation was done, were excluded from the study.

Results: There were 358 patients, among which the mortality was 4.4% and the limb salvage rate was 75%. The causes of trauma were Road Traffic Accidents (RTA) n = 197 (55.02%), Firearms n = 72 (20.11%), Bomb-blast n = 18 (5.02%), Industrial accidents 36 (10%) and 10% were miscellaneous. Major arterial injuries were Popliteal Artery n = 154 (43%) followed by Femoral artery n = 100 (28%), brachial n = 72 (20%), Axillary n = 18 (5%), Sub-clavian n = 8 (2%) and Infra-Popliteal n = 8 (2%) arteries. Wound infection n = 52 (14.7%), renal failure n = 41 (11.7%) and graft thrombosis n = 30 (8.5%) remained on the top of the list for immediate complications. Delayed consequences like traumatic arterio-venous fistulas (n = 30), pseudo-aneurysms (of major and minor vessels) (n = 51) has been observed.

Conclusion: Vascular injuries of the extremities remain immediate challenge in developing nations where the services are not much effective in dealing with vascular injuries.

The cases which present after 12–24 hours with major vascular injuries have much higher rate of amputations in comparison to above two.

The limb which remain untreated or poorly treated have been frequently seen with late consequences of vascular injuries like major traumatic AV-fistulas, false (pseudo-) aneurysms or consequences of chronic limb ischemia including significant claudication and ischemic ulcers.

Keywords: vascular injuries of extremities, false aneurysms, arterio-venous fistula

OP-071

Through Knee Amputation—An Ideal Amputation in a Dysvascular Patient?

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Army Hospital

Aim: To determine the utility of a through knee amputation in a dysvascular patient vis a vis the standard below knee and above knee amputations.

Methods: Retrospective analysis of 68 vascular amputations over 7-year period with special reference to stump healing, ambulation, prosthetic rehabilitation and final outcomes.

Results: 226 TK amputations were performed compared to 18 BK and 24 AK in the study period. 24 were primary amputations and 44 were secondary amputations upto 4 years after failed revascularisation in the past. Age range was 35–76 years; Male to female ratio 3:1. Primary healing rate of TK and AK amputations was 80–85% compared to 44% of BK ($p < 0.05$). At 6 months, 7 AK amputation patients, 4 TK amputation and only 1 BK amputation patient had died ($p < 0.05$). The ambulation rate among survivors was 80% for BK and TK patients compared to 54% with AK prosthesis ($p < 0.05$).

Conclusion: TK has as good healing rates as AK, and as good ambulation rates as BK. It is simpler, provides better biomechanical advantage in the bed for mobility and with newer prosthetic fitments ambulation rates are similar to below knee amputees.

There is a need to become rehabilitation minded and revisit this amputation technique in dysvascular patients.

Keywords: through knee amputation, dysvascular patient, ambulation

OP-072

Emergency Vascular Injuries; Patient Profile and Risk Factors for Mortality

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Aim: Vascular injuries constitute about 2–3% of all trauma cases. Mortality along with loss of extremity are major complications which require prompt diagnosis and treatment. We present our patients with vascular injuries and define risk factors for mortality.

Material-Methods: Between September 2009 and June 2013, 161 patients were surgically treated for vascular injuries. Patients were taken to the operation emergently after clinical assesment (68.9%) or after diagnostic imaging such as Doppler USG (3.1%), CT angiography (22.4%) or MR angiography (4.3%).

Results: The mean age of patients was 30.3 ± 11.8 (range; 8–80) years and male patients constituted the majority (96.9%). Penetrating injuries (89.4%) were more common and most injuries involved upper extremity (49.1%) followed by lower extremity (41%), abdomen (5.6%), neck (2.5%) and thorax (1.9%). Radial and ulnar arteries together were the most common sites of injury at upper extremity (73.4%) whereas superficial femoral artery (34.8%) and popliteal artery (31.8%) were mostly involved in lower extremity. Abdominal injuries included 4 aortic, 3 vena caval and 2 mesenteric artery injuries. Concomitant tendon and nerve injuries were more common in upper extremity ($p < 0.001$). Simple ligation (14.3%) was used for small vessel injuries whereas end-to-end anastomosis (49.7%) and repair with a saphenous vein (32.3%) or prosthetic greft (4.3%) was used for more complex cases. Simultaneous embolectomy was performed in 61 patients (37.9%). Mortality was seen in 10 patients (6.2%). Major risk factors for mortality were abdominal localization of injury ($p < 0.001$), hemodynamic instability at admission ($p < 0.001$) and low hematocrite levels before the operation (33.4 ± 5.6 vs. 18.1 ± 9.1; $p < 0.001$).
Conclusion: Vascular injuries should be diagnosed and treated promptly. Only clinical assesment may be enough in many emergency cases. Autologous tissues should be the initial choice for surgical repair. Patients with hemodynamic instability and major blood loss before the surgery should be managed with surgery and medical resuscitation simultaneously to prevent patient loss.

Keywords: vascular inuries, surgery, mortality

OP-073

An Easy Way to Develop Experimental Canine Model of Stanford Type B Aortic Dissection with Intravenous Epinephrine Injection

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Aims: To improve the modeling method of canine Stanford type B aortic dissection (AD).
Materials-Methods: Sixteen beagle dogs were studied. After exposing and partially clamping, the descending aorta was cut through the adventitia to one-third the depth of the tunica media. The aortic wall was divided into 2 layers by raspatory. Then half the circumference of the inner layer was transversely cut. All the layers proximal and the outer layer distal were anastomosed together. Epinephrine was used to increase the BP. This resulted in an immediate expansion of the false lumen, and was stopped by nitroglycerin when necessary. The canines underwent DSA and CTA immediately, 1 week and 1 month after.
Results: Twelve dogs successfully underwent the operation. Dissection formation was observed immediately after the administration of epinephrine and confirmed by DSA and CTA check. The aorta specimens showed typical dissection characteristics such as tear, septum, true and false lumen. Microscopic examination showed that the dissection was present in the tunica media, making it identical to the AD in humans.
Conclusions: It is an easy and feasible way to develop Stanford type B AD model by using intravenous epinephrine injection methods.

Keywords: stanford type B, aortic dissection, canine model, epinephrine

OP-074

Major Distal Vascular Reconstruction is Successful for the Salvage of the Amputation Candidate Extremity

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Long term results of the reconstuctive surgical management for major infragenual firearm injury is not satisfactory. Thermal injury, extensive bone fracture and tissue loss are some of the reasons of the impaired outcome. Patients with major injury on this site are frequently underwent amputation of the extremity, especially when infragenual arterial structures were excessively affected. Our institutional approach to the management is full arterial and venous revascularization of the leg and sparing the extremity as much as possible. We present the successful outcome of the 9 patients with amputation-candidate major firearm injury who underwent reconstructive surgery. Following the external fixation of the skeletal structures, all patients are considered for the availability of distal revascularization. Vascular structures were primarily anastomosed if suitable, however; large tissue loss on the affected area did not permit such kind of reconstruction in the most of the patients. The saphenous vein of the other leg is predominantly used to be interposed between the vascular sites to prevent venous congestion on the affected extremity. Plastic

Photo

reconstruction was initiated when a successful revascularization was accomplished. Osseal reconstruction was not performed in the initial reconstructive step and performed if needed during the follow up.

Patients were followed up for 18 months. Any of them needed amputation. Full functional recovery was achieved in 4 patients. Remaining 5 patients have vital extremities without motor functions. ! patient underwent second operation for the recovery of the defect of the tibia. In the light of this data, we recommend insistent reconstructive surgery for the major infragenual firearm injuries even if extensive bone fracture, severe vascular impairment and tissue loss are present.

Keywords: infragenual bypass, firearm injury, reconstruction

Peripheral arterial disease 1

OP-075

Upstroke Time and Percent Mean Artery Pressure of Pulse Waveform in Combination with Ankle Brachial Pressure Index are Useful Predictors for Critical Limb Ischemia in Asymptomatic Contralateral Limbs in Patients with Critical Limb Ischemia

***Takuro Shirasu*[1]**, *Akihiro Hosaka[1], Takuya Miyahara[1], Katsuyuki Hoshina[1], Hiroyuki Okamoto[1], Kunihiro Shigematsu[1], Tetsuro Miyata[1], Toshiaki Watanabe[2]*

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Background: Although ankle brachial pressure index (ABI) is used to detect patients with peripheral arterial disease, it sometimes misses patients at high risk for critical limb ischemia (CLI) due to arterial stiffness. Upstroke time (UT) and percent mean artery pressure (%MAP) of pulse waveform can reflect the stenosis or occlusion of lower leg arteries independent of ABI. The aim of this study is to determine the usefulness of UT and %MAP as predictors of whether asymptomatic contralateral limbs in patients with CLI progress to CLI.

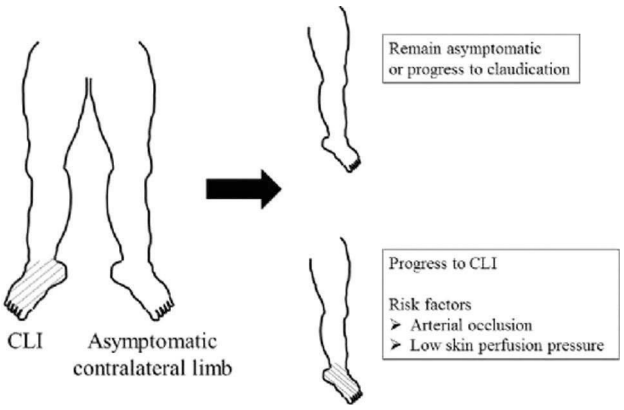
Methods: We retrospectively reviewed asymptomatic limbs of patients who received treatment for CLI at our tertiary medical hospital between 2007 and 2011. Asymptomatic contralateral limbs of CLI, which were considered to be at high risk for CLI, were examined. Patients who had been followed up over 6 months were included. The usefulness of UT and %MAP in combination with ABI was compared to that of ABI alone to detect patients who eventually progress to CLI.

Results: Forty-six patients (mean age, 67 ± 12; 34 male) were included. Cardiovascular risk factors were shown in the table. The sensitivity of ABI for the detection of lower limb arterial stenosis or occlusion was 84%, whereas that of combination of ABI, UT and %MAP (ABI/UT/MAP) was 97%. The sensitivities of ABI and ABI/UT/MAP for low value of SPP (<40 mmHg) were both 100%. Twenty-two patients progressed to CLI during the follow-up period (25 ± 13 months). The likelihood ratio test adjusted for diabetes mellitus and history of coronary artery disease revealed that abnormal ABI/UT/MAP was a significant risk factor for CLI (p = 0.029), but ABI alone was not (p = 0.27).

Conclusions: UT and %MAP in combination with ABI were useful predictors of whether asymptomatic contralateral limbs in patients with CLI progress to CLI.

Keywords: upstroke time, mean artery pressure, pulse waveform, ankle brachial pressure index, critical limb ischemia, peripheral arterial disease

Fate of asymptomatic contralateral limbs of CLI and the risk factors for CLI



Risk factors and result of chi-square test for CLI

Risk factors		p value for CLI by chi-square test
Age	67±12	0.69*
Sex (male)	34 (74%)	0.86
Hypertension	38 (83%)	0.89
Diabetes	31 (67%)	0.046
Dyslipidemia	20 (43%)	0.80
Smoking	31 (67%)	0.91
End stage renal disease	22 (48%)	0.38
Coronary artery disease	20 (43%)	0.041
Cerebrovascular disease	11 (24%)	0.23
Abnormal ABI	33 (72%)	0.15
Abnormal ABI/UT/MAP	41 (89%)	0.023

*age over 65 years old

OP-076

Percutaneous Transluminal Angioplasty for Peripheral Arterial Disease (PAD) in Hemodialysis (HD) Patients

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Purpose: In Japan, most patients with end stage renal disease were started having hemodialysis (HD) without kidney transplantation.

In our hospital, PTA is the first choice for PAD in HD and we would like to present our outcome in this group of patients.

Methods: From 2011 to 2013, we have performed PTA on 123 lower extremeties on 103 PAD patients. HD patients were included in 21%, 28 lower extremeties on 22 patients.

Results: In HD patients, the rate of critical limb ischemia was 79% and this result was significant (($p < 0.0001$).

In HD patients, the rate of ischemic heart disease and cerebrovascular disease were significant, 71% and 64% ($p = 0.006$, $p = 0.003$).

No mortality or major complication occurred during hospitalization, however, following mortality was all HD patients.

Five extremeties in HD patients received following major amputations ($p = 0.015$).

There were no significant differences in graft patency between HD and non HD patients.

Conclusions: The rate of polyvascular disease and CLI were significant high in HD patients, furthermore, mortality and amputation rates were also high in HD patients.

Hemodialysis was one of the risk factors in PTA of PAD patients, and early detection of PAD in HD patients with mild symptoms and early treatment are important.

Our strategy provided acceptable outcome.

Keywords: peripheral arterial disease (PAD), hemodialysis (HD), percutaneous transluminal angioplasty (PTA)

OP-077

Assessment of the Efficacy of Treatment Options in Critical Limb Ischaemia According to Patient-Oriented Outcomes

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Background: Outcomes following vascular interventions in critical limb ischaemia (CLI) have traditionally been measured by vessel/graft patency, limb salvage rates and mortality. These have become known as physician-oriented outcomes. However, it has been demonstrated that 10% of patients with patent infrainguinal grafts report no improvement in symptoms after 1 year. Furthermore, 7.4–9% of patients with patent grafts succumb to amputation. How we assess success has therefore been questioned. Patent-oriented outcomes are considered to be tangible results that patents report as significant to the quality of their lives, and may correlate better to functional goals than physician-oriented outcomes.

Aim: The aim of this study is divided into 2 complementary parts: Part A: To define patient-oriented outcomes by performing a patient survey. Part B: Systematic review of treatment options in lower limb CLI according to patient-oriented outcomes, defined by part A.

Methods: Part A: CLI patients ranked 10 outcomes according to importance. Part B: A systematic review of randomised control trials assessing angioplasty, stenting and bypass surgery according to patient-oriented outcomes.

Results: Part A: A patient survery indicates that QOL, symptom relief, living status, amputation-free survival and mobility should be considered patient-oriented outcomes. Patients place little importance is placed on vessel patency and reintervention. Part B: 6 RCTs involving 1166 patients assessed QOL, symptom relief, and amputation-free survival following vascular intervention. There is no significant difference in QOL between bypass surgery and angioplasty. There is no difference in symptom relief between sirolimus-eluding stents and angioplasty. Bare-metal stents and angioplasty were not significantly different in providing symptom relief. There was poor correlation between traditional outcomes and patient-oriented outcomes.

Conclusion: This study used patients with CLI to defined patient-oriented outcomes. There is no evidence supporting a single superior treatment between angioplasty, stenting and bypass surgery when assessed by patient-oriented outcomes.

Keywords: peripheral arterial disease, critical limb ischaemia

OP-078

Initial Peripheral Vascular Stent Implantation Experiences

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Aim: Peripheral vascular disases are high morbidity diseases. Early intervention to peripheral arterial stenoses are very important for patient's life quality. The aim of this study to evaluate the initial experience for peripheral vascular stent implantation in a new cardiovascular surgery center.

Material-Methods: A retrospective review was performed between May 2012 and May 2013. Mean age was 58 years. Fifteen peripheral stent implantation were performed to 13 patients using femoral arterial access. Coronary angiograph was also performed all of the patients at

the same time of peripheral vascular angiographic intervention. Antiplatelet and anticoagulant treatment were given preoperative and postoperative all of the patients.

Results: Eleven iliac artery stenting and 4 femoral artery stenting was performed. More than one stent was implanted to 2 patients. 3 self expandable and 12 balloon expandable stent used for implantation. Coronary stent was implanted in 2 patients before peripheral vascular intervention. Aortic dissection occured in the direction of blood flow in 1 patient and treated using balloon dilatation. Femoro-Popliteal Bypass surgery performed to 2 patients after iliac stent implantation.

Conclusions: Peripheral arterial stenting is an important intervention for prognosis of peripheral arterial disases. Early stenting of the arterial stenosis reduces morbidity, delays surgical interventions and increases life quality.

Keywords: vascular disase, stent implantation, intermittent claudication

OP-079

Evaluation of the Histopathological Factors for the Salvage of Upper Limb in Crush Injuries

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Aim: Major blunt upper extremity injuries are associated with multiple trauma and the pathological events of the arterial system may be easily overlooked. The aim of the study is to investigate the treatment choices that may impact the salvage of the limb after the major trauma and its related underlying pathophysiological factors.

Material and Methods: The clinical and histopathological findings and operative management of 12 patients with blunt injuries of the upper limb over a 18-month period were reviewed. All axial arterial system of the injured limb was assessed with DSA (Digital Substraction Angiogram) preoperatively. At the time of diagnosis, all patients were underwent operation with revascularization of the axial system. Injured vessels were harvested for underlying histopathological events. Whenever required, Fasciotomy process for compartment syndrome, reduction and fixation process for bone fractures were done. Revascularization was reassessed by DSA on the first day of the operation.

Results: Five patients with the brachial artery injury, and seven patients with both radial and ulnar artery were treated. Compartment syndrome developed in one brachial artery and five dual radial-ulnar artery injuries. In three of these cases, initial successful revascularization occluded postoperatively, and revascularized again, but in one case limb amputation was occured. Case review of the histopathological examination revealed full-layer rupture of the arteries in all cases.

Conclusion: The first aim is reperfusion, so the principle methods of the treatment are stabilization of the bone before revascularization, elimination of the compartment syndrome for distal runoff, verification with postoperative DSA. Embolectomy is a time wasting procedure for these events, since the histopathological cause of the injured vessel demonstrated complex occlusion. This study showed that upper limb crush injuries, if treated promptly and in an appropriate fashion provide favorable results.

Keywords: crush injury, arterial revascularization, histopathology, DSA

OP-080

Covered Stent Applications for Femoral Artery Pathologies

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Objectives: To present the successful endovascular treatments of various femoral artery pathologies with covered stent.

Methods: We performed self-expandable Viabahn® covered stent applications in 9 male patients for various femoral artery pathologies (a total of 10 procedures) between August 2011 and June 2013.

Results: Four patients had arteriovenous fistula, 1 patient had active femoral artery bleeding, and the rest of the 4 patients had femoral artery pseudoaneurysm. While 3 patients with arteriovenous fistula had a history of coronary angiography, the ohter patient had a history of getting shot with a gun. While four arteriovenous fistula in 3 patients was observed between deep femoral artery and femoral vein, fistula was revealed between superficial femoral artery and femoral vein in the other patient. Two of four patients with pseudoaneurysm had a history of bypass graft operation, the other two patients with pseudoaneurysm had a history of trauma. Active femoral artery bleeding patient was recieving thrombolytic treatment after serebral coil embolization. All covered stents were placed successfully. Dual antiplatelet theraphy with clopidogrel and aspirin in postoperative period was given.

Conclusion: Endovascular treatment of femoral artery pathologies with Viabahn® covered stent is an effective and feasible minimal invasive alternative procedure in selected cases.

Keywords: femoral artery, covered stent, arteriovenous fistula, pseudoaneurysm

OP-081

Outcome of Superficial Femoral Vein Grafts for Distal Bypasses in Patients with Critical Limb Ischemia

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Objective: To investigate the early outcomes of the superficial femoral vein graft (SFVG) used for distal bypasses in patients with critical limb ischemia (CLI), our results were summarized.
Design: Retrospective study.
Methods: In the last decade, March 2003 April 2013, 29 SFVGs were used for distal bypasses in 27 patients with CLI, which included 20 hemodialysis. Of 29, 20 were used for infrapopliteal bypasses, and the remaining 9 were femoro-popliteal bypasses. 19 were used spliced grafts. SFV was harvested from immediate distal to the bifurcation of the deep femoral vein to distal to above knee levels, and 10 were used as in-situ graft. After surgery, all patients were given anticoagulant and antiplatelete medicines for 5 years or more.
Results: Primary and secondary patency rates of SFVGs at one year were 34% and 69%, respectively, and limb salvage rate at 3 years was 79%, suggesting importance of graft surveillance and revision surgery. The main cause of graft failure was progressive thrombotic accumulation in SFVG and intimal hyperplasia in the other vein segments of spliced vein grafts due to the low graft flow.
Conclusions: SFVG is useful for distal bypasses as a last graft option, but postoperative anticoagulant therapy and intensive surveillance will be necessary in infrapopliteal bypasses with poor run-off.

Keywords: critical limb ischemia, superficial femoral vein, bypass surgery

OP-082

Tips and Tricks for Successful Distal Venous Arterialization for Limb Salvage

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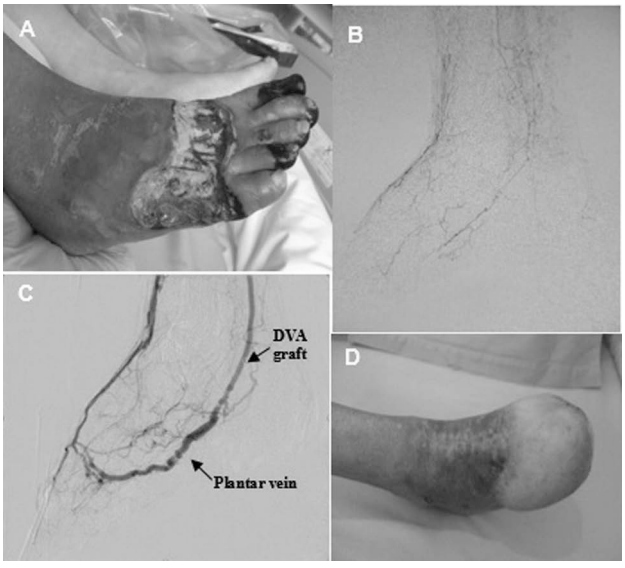
Objectives: Distal venous arterialization (DVA) is a last resort of limb salvage surgery for patients without graftable distal arteries due to advanced occlusive lesions. We present indications and techniques for critical limb ischemia (CLI).
Patients: Since 2003, we have performed DVA for 20 patients. Our primary indication was limited to progressive or extensive tissue loss without graftable distal arteries in patients with CLI. There were 15 diabetes (10 dialysis), and 5 vasculitis. Procedures included combined DVA and free flap, primary solitary DVA, and as adjuvant procedure, DVA for arterial access of free flap was performed.
Techniques: Valves were destructed by a surgical probe and by 2 Fr. Fogarty balloon catheter. Successful valve destruction was confirmed by visualization of plantar metatarsal veins in intraoperative descending venography. Using autogenous vein graft, DVA bypass from popliteal or tibial artery to the common plantar vein was performed. To facilitate earlier spontaneous valve incompetence, systemic arterial pressure in DVA system should be maintained, and adequate ligation for arteriovenous fistulae (AVF) under monitoring DVA graft flow was essential, and DVA graft flow was controlled 12–120 ml/min (median: 40) by AVF ligation.

Figure



64 yrs. Male with vasculitis of SLE: A, extensive progressive gangrene before DVA; B, preoperative IADSA, showing no graftable distal arteries; C, DVA for plantar venous system; 4 months after DVA with free flap.

Results: There were 4 major amputations (DVA failure due to being too late in 3, tibia osteomyelitis in 1), and 3 early deaths in dialysis. Limb salvage was achieved in 14 patients (78%), with follow-up period of 1–94 months (Me: 3 years). All of the 14 patients had no difficulties in a short walk or inside a house without the prosthesis. Arteriography after 3 years demonstrated not only a functioning graft and the feeding artery to the free flap, but also ample peripheral microvasculature via plantar veins in the sole.
Conclusion: This operation is time consuming, and required rather complicated techniques, but the present favorable results convinced us to be a novel last operation for limb salvage in patients.

Keywords: distal venous arterialization, critical limb ischemia, limb salvage, bypass

OP-083

The Role of Endothelial-Mesenchymal Transition in Vein Graft Remodeling and the Involvement of Notch Signaling System

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First Hospital of China Medical University

Aim: Endothelial to mesenchymal transition (EndMT) was found to be involved in fibrosis, which has proximity to the process of venous graft remodeling after vein-artery bypass. This study aimed to confirm that EndMT is involved in human saphenous venous endothelial cells (HSVECs) activated by inflammatory factors and in murine venous graft, with the involvement of Notch signaling system.
Material-Methods: HSVECs were harvested from patients undergoing coronary artery bypass surgery and exposed to TGF-β1, IL-1β and TNF-α. Lineage tracing of EndMT in Cdh5CreERT2; mT/mG mice were used. Murine vena cava-aorta grafting model was made.
Results: HSVECs underwent phenotype changes and gained mesenchymal features after exposed to TGF-β1, IL-1β and TNF-α. The change was inhibited by administration of BMP-7 and Notch-3 knockdown. 4 weeks after vena cava-aorta grafting, epithelial cells showing mesenchymal phenotypes were found.
Conclusions: EndMT exists in HSVEC stimulated by inflammatory factors in vitro. EndMT exist in models of allotransplantation of murine aorta and murine autologous vena cava-aorta grafting in vivo. BMP-7 inhibits the EndMT of HSVEC in vitro. Knockdown of Notch3 also inhibits the EndMT of HSVEC in vitro.

Keywords: intimal hyperplasia, remodeling, endothelial-mesenchymal transition, vein graft, restenosis

Peripheral arterial disease 2

OP-084

In Revascularization of Diabetic Foot, Should we Rely on Angiosome Concept?

Jae Young Park, *Taeseung Lee*

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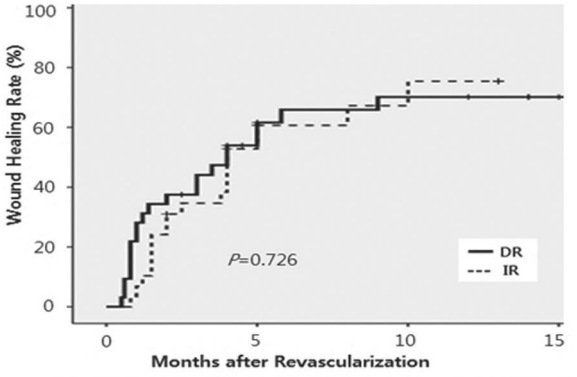
Objective: This study is designed to identify the validity and efficacy of infrapopliteal angioplasty based on angiosome concept.
Methods: A total 56 patients (61 limbs) with diabetic foot (ulcer or/with gangrene) are included which has undergone successful infrapopliteal revascularization in single center. The diabetic limbs are divided into two groups; direct (DR) or indirect revascularization (IR), which is based on angiosome concept. Diabetic foot belonged to direct revascularization when direct arterial flow to the site of foot ulcer based on angiosome concept. The wound status, healing rate and amputation rate was compared between the two groups, during the follow-up (1, 3 and 6 months) after each type of revascularization (DR/IR).
Results: DR was achieved in 32 limbs compared with IR in 29 limbs. Complete wound healing rate during short-term follow-up (1 month) was higher (11.5%) in DR group, which is compared with 3.4% in IR group (P = 0.041). However, after the lapse of time, complete wound healing rate between the two groups had no significant difference; 37.5% in DR group and 37.9% in IR group at 3 months (P = 0.972), 62.5% in DR group and 62.1% in IR group (P = 0.972). The average wound healing time was 3.32 months in DR group and 3.31 months in IR group without statistical significance (P = 0.993). The overall amputation rate (minor or

Wound healing rate after revascularization of DM foot



Legs with unhealed diabetic foot				
DR				
	32	19	8	6
IR				
	29	18	6	3

DR: Direct Revascularization IR: Indirect Revascularization

major) was 9.4% vs. 0% at 1 month (DR vs IR, P = 0.239), 9.4% vs 10.3% at 3 months (P = 1.000) and 18.8% vs. 10.3% at 6 months (P = 0.478).

Conclusions: Compared with IR, DR has no different wound healing rate and amputation rate in the course of time. Angiosome concept is not an essential rule in the case of infrapopliteal revascularization for diabetic foot in our experience.

Keywords: diabetic foot, angioplasty, angiosome

OP-085

Surgical Management of Subclavian and Axillary Vascular Injuries

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Background: Complex surgical exposures to upper extremity injuries required for conventional surgery correlate with a high morbidity and mortality. This study evaluated the patients who were operated on with conventional surgery for subclavian-axillary artery injuries.

Materials-Methods: Between December 2003 and April 2011, 23 cases with subclavian-axillary vascular injury were operated. Preoperative, peroperative and postoperative data in these cases were respectively reviewed.

Results: Seventeen (73%) of patients were male and their age ranged from 15 to 74 years (mean 37.4 ± 18.4 years). The causes of injuries were stab wounds in 8 cases (347%), gunshot wounds in 5 cases (217%), iatrogenic injuries in 6 cases (26%), and blunt trauma 4 cases (17.3%). Localization of the injuries was the axillary artery in 15 (65.3%) cases and the subclavian artery in 8 (34.7%) cases. Eight patients (34.7%) had isolated arterial injury, accompanied by venous injuries in 12 (52%) cases, bone injuries in 6 (26%) cases, peripheral nerve injuries in 5 (21%) cases and muscle-tendon injuries in 2 (8%) cases. The surgical methods performed were saphenous vein interposition in 10 arterial injuries (43.4%) and 2 venous injuries, repair in 11 (47.8%) arterial injuries, and 7 venous injuries, end-to-end anastomosis 2 arterial injuries (8.6%), 2 venous injuries, and ligation in 1 venous injury. The mean duration of hospitalization was 7.43 ± 5.84 (range 3–21) days. In the postoperative period, fasciotomy was performed in 5 (21.7%) cases, wound infection due to extensive tissue defects was developed in 3 (13%) patients, partial neurologic deficits in upper extremity were persist in 2 (8.6%) patients, disarticulation was performed because of complicated and contaminated injuries in 1 (4.3%) patient, and mortality developed in 1 (4.3%) patient due to myocardial infarction.

Conclusion: Vascular injuries of subclavian-axillary frequently are associated with neurogenic, osseous and soft tissue injuries and should be early intervention.

Keywords: subclavian-axillary, vascular, injury

OP-086

Aortobifemoral Bypass via Paramedian Incision and Retroperitoneal Approach for Aortoiliac Occlusive Disease

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Introduction: Aorto-bifemoral graft bypass operation is performed in the surgical treatment of aortoiliac occlusive disease. The conventional standard technique used is the median laparotomy and transperitoneal approach. In this study we evaluated the outcome of aortobifemoral bypass operation via paramedian and retroperitoneal approach.

Methods: 17 patients were operated upon for aortobiiliac occlusive disease from January 2008 through December 2011.

Mean age of the patients was 61.8 ± 8.9 (47–78 years). All patients except for one were operated via left paramedian vertical 8 to 10 cm incision approximately 6 cm to the left or right of midline, extending from a few centimeters above the umbilicus to just above the symphysis pubis. The aortas were reached retroperitoneally through this incision.

Results: There was one postoperative death secondary to pulmonary complications. No intraoperative or postoperative surgical complication had occured. All patients were discharged from the hospital on antiplatelet therapy. Graft patency was evaluated by means of physical examination on discharge. Upon the patients' hospital discharge, primary graft patency was 100%. The ankle-brachial indices measured from both the right and left sides were 0.51 ± 0.10 preoperatively and 0.99 ± 0.14 postoperatively ($p < 0.001$).

Discussion: A lot of complications can be observed due to median laparotomy such as evisceration, incisional hernia, peritonitis, bride ileus. We believe that retroperitoneal approach for aorto-bifemoral graft bypass operation in the patients with bilateral iliac arterial occlusive disease is a well tolerated minimally invasive operation when compared to the conventional median laparotomy approach.

Keywords: peripheral varsular disease, aortoiliac occlusion, surgery

OP-087

Paramedian Retroperitoneal Approach for Revascularization of Aortoiliac Occlusive Disease

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Objective: Many techniques have been reported for the treatment for aortoiliac occlusive disease. The present study retrospectively analysis revascularization of aortoiliac occlusive disease via paramedian incision and retroperitoneal approach. The technique was compared in unilateral and bilateral revascularizations.

Methods: From January 2005 through December 2012, 74 patients underwent surgical revascularization for aortoiliac occlusive disease via paramedian incision and retroperitoneal approach. The operations were aortofemoral bypass (40 patients), iliofemoral bypass (18 patients), aortoiliac bypass (2 patients) and aortobifemoral bypass (18 patients). Data of the patients for unilateral aortoiliac revascularization were compared with bilateral aortoiliac occlusive disease. The preoperative characteristics and perioperative data of the patients were analyzed.

Results: Mean age of the patients was 61.6 ± 9.5 years. Three patients (3.9%) died postoperatively due to myocardial infarction and pulmonary complications. No intraoperative complications occurred. Six patients required subsequent reoperation: 2 for acute distal embolism to the contralateral limb, 2 for distal anastomosis leakage and 2 for local distal wound infection. These were successfully treated. The patients were discharged from the hospital on antiplatelet therapy. There was not a significant difference between the unilateral and bilateral revascularization groups according to length of intensive care unit stay, starting date for oral intake, preoperative and postoperative hemoglobin levels, hematocrit levels, creatinin levels and need for transfusion.

Conclusion: The retroperitoneal aortoiliac approach with a paramedian incision has few complications and good surgical outcomes.

Keywords: ischemia, surgery, revascularisation

Paramedian incision

Postoperative view of the surgical incisions of the patient

OP-088

Stent Grafts for Popliteal Aneurysms Anaconda Limbs as Conduits

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Introduction: Treatment of popliteal aneurysms with open bypass and exclusion has been quite successful when conduits have been available and of good quality. However in the absence of good quality venous conduit, alternate strategies have to be adopted. Covered stents for popliteal aneurysms have had limited success due to the rigidity and inability to conform to the complex movements of the artery with the knee joint. Anaconda stent graft systems have been recently used for popliteal aneurysms.

Aims: To report a series of patients where Anaconda stent grafts have been used to treat popliteal aneurysms.

Methods: A total of 12 Anaconda stent grafts have been used in 10 patients at Waikato Hospital for treatment of popliteal aneurysms. 10 patients had prior AAA repairs and one patient had a prolonged hospital stay with bilateral limb ischaemia and faciotomies. Most patients had no conduit. Pre-operative planning was done using Duplex ultrasound for graft sizing.

Due to scarred groins, 11 patients had SFA cutdowns for access and were done under spinal anaesthesia.

Results: All stent grafts were deployed successfully. Intra-operative flexion of the knee joint showed excellent conformation of the stent graft, with no kinks. Mean day stay was 2 days. Post operative Duplex showed complete exclusion of the sac in all patients. There was no gradient in ABPI's on flexion of the knee joint to 90 deg. All patients had Clopedigrol for 2 weeks post stent grafting. 10 patients have completed 2 year follow up. There has been one asymptomatic occlusion. All other aneurysms stay excluded at 2 years.

Conclusions: Anaconda stent graft system appears to treat popliteal aneurysms effectively. The graft seems to conform to the various forces acting across the artery with knee movements. Long term follow up is still needed in these patients with Duplex scanning.

Keywords: popliteal aneurysms, anaconda limbs, stent grafts, exclusion

OP-089

Contemporary Trend and Outcome of Surgical Revascularization in Peripheral Arterial Disease: A 5-Year Local Experience in Hong Kong East Cluster

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Objective: We review our experience in surgical revascularization for peripheral arterial disease between year 2008 and 2012. We aim to describe the current trend of treatment approach and evaluate revascularization outcome.

Methods: All patients with peripheral arterial disease receiving surgical revascularization in a single surgical division between 2008 and 2012 were reviewed retrospectively. Patients' demographics, clinical profile, operative records and outcome were retrieved from electronic and printed patient records. Lesion characteristics were documented in accordance with Trans-Atlantic Inter-Society Consensus (TASC) grading by computer tomographic angiogram or intra-operative angiogram. Clinical outcome was evaluated post-operatively according to the reporting standards of the Society for Vascular Surgery.

Results: 167 procedures were performed on 160 patients with median age 81.0 ± 10 years. 78 patients (48.8%) received endovascular interventions and 75 (46.9%) had bypass operations. 7 patients (4.4%) received hybrid procedures. Between 2008 and 2012, we observed an overall increasing trend of endovascular procedures being performed (+57.1%) and a drop in bypass surgery (–18.8%). Endovascular interventions were performed in 77.2% of TASC C cases, while 76.0% of TASC D cases had bypass operations. Comparing outcome between endovascular and open interventions, primary patency (79.2% vs. 74.7%, p = 0.478), secondary patency (88.9% vs. 50%, p = 0.061) and limb salvage rate (84.4% vs. 76.0%, p = 0.180) appeared superior in endovascular group, but results were not statistical significant. Endovascular procedures performed on infra-popliteal lesions showed lower limb salvage rate (61.1% vs. 93.0%, p = 0.001). Such outcome may reflect more liberal attempts of angioplasty in patients with poorer clinical status and more advanced lesions.

Conclusion: Endovascular intervention is establishing its role as mainstream intervention in peripheral arterial disease with comparable outcome but lower morbidity. Bypass surgery remains the approach of choice in difficult cases (TASC D) or failed endovascular procedures.

Keywords: peripheral, arterial, endovascular, bypass, revascularization, trend

OP-090

Double Tract Vein Graft as an Alternative Conduit for Tibial Bypass

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Aim: To elucidate long term results of the tibial bypass using double tract vein graft.

Material-Methods: Duplicated great saphenous vein often form closed loop around the knee joint. Even if the main trunk of saphenous vein does not have the diameter not big enough to use as a single conduit, the two paralleled conduits could bring enough blood flow. We try to excise whole loop of the vein to use as a single conduit for the tibial bypass. The efficacy and long term results of this technique were analyzed retrospectively.

Results: We have performed this double tract saphenous vein bypass in 4 cases with critical limb ischemia. One female patient aged 28 was diagnosed as Buerger disease, and the rest of the patients were atherosclerotic in origin. All patients had leg ulcers or rest pain and diagnosed critical limb ischemia according to the TASC definition. The operations performed were 2 femoro-anterotibial bypass, one popliteo-anterotibial bypass and one popliteo-peroneal bypass. We followed them in outpatient clinic every 3 months and the patency of the graft was confirmed by duplex scan or CT angiography or both. All graft stayed patent 4 months

Figure

Post-operative CT angiogram of double tract vein bypass. The looped vein graft is found patent.

to 2 years and 3 months after the operation. Ischemic symptoms disappeared in all cases.
Conclusions: The double tract vein bypass could be an alternative option when the great saphenous vein is partially narrow.

Keywords: tibial bypass, double tract vein graft, great saphenous vein, peripheral arterial disease

OP-091

Impact of CD34(+) Pluripotent Mesenchymalstem Cell Therapy in Patients with Chronic Critical Limb Ischemia

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Aim: Recently bone marrow or peripheral blood derived stem cell therapy has been used in many fields of clinical medicine. In patients with peripheral vascular disease in whom limb salvage is not possible with conventional therapies, stem cell therapy emerges as a promise. In this study, we searched the impact of bone marrow derived stem cell therapy in patients with chronic critical limb ischemia (cCLI) and are not suitable for revascularization.
Patients and Method: Fifteen patients were prospectively included into the study (between 32 to 70 years old and male/female: 13/2). All patients severe had severe resting ischemic leg pain and ulcer. Preoperatively assessment of vascular system for revascularization was done with magnetic resonance imaging (MRI) or computerized tomography (CT) angiography. All patients had also perfusion MRI of the ischemic limb. Bone marrow aspiration (240 ml) was performed from iliac crest and centrifuged for collection of CD34(+) mesenchymal pluripotent stem cells. CD34(+) cell fraction in bone marrow aspirates was assessed by flow cytometry analysis.Bone marrow cell fractions that definitely contained CD34(+) cells were ranged from 0.44% to 2%.Intramuscular injection of CD34(+) stem cell to ischemic limb was performed under local anesthesia. At the end of follow up, efficacy of stem cell therapy was assessed by both perfusion MRI scanning and clinical outcome. Patients convalescence was evaluated by SF-26 Quality of Life (QoL) questionnaire.
Results: All patients except 1 completed follow up and the mean follow up was 14 ± 10.8 months. Clinically 5 patients (out of 14) had undergone limb amputation and salvage of ischemic extremity was achieved in the rest (9 of the 14 patients, 64%). Patients with limb salvage have significant improvements in resting pain and quality of life at the end of follow up. Perfusion MRI revealed increased neovascularity.
Conclusion: Our results show that CD34(+) stem therapy causes improvements in the symptoms and QoL and decreases the rate of amputation in cCLI.Bone marrow derived CD34(+) stem therapy for cCLI seems to be a promising therapy in cCLI patients who are not suitable to conventional therapies.

Keywords: CD34(+), pluripotent mesenchymal stem cell, critical limb ischemia

Peripheral arterial disease 3

OP-092

Factors Enhancing Ischemic Necrosis of Legs in Critical Limb Ischemia

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Aim: Patients with critical limb ischemia (CLI) may have either the ischemic necrosis of lower extremity or only the ischemic rest pain. The aim of this study was to identify the risk factors enhancing the development of ischemic necrosis of the legs in CLI.
Material-Methods: During the 3 years between March 2010 and February 2013, the 103 consecutive patients with CLI underwent vascular surgery (12 patients, 11.7%), radiological intervention (11 patients, 10.7%), and hybrid vascular procedures including simultaneous surgery and radiological intervention (80 patients, 77.7%). The preoperative clinical data of the 103 patients were analyzed. The patients were divided into 2 groups, necrosis (N group, 41 patients, 39.8%) and non-necrosis groups (NN group, 62 patients, 60.2%) of the legs. The risk factors investigated were age, sex, hypertension, smoking, cigarette pack year, body mass index (BMI), HbA1c, total cholesterol, HDL, LDL, Triglyceride, calcium, phosphorus, magnesium, anticardiolipin antibody IgG/IgM, lupus anticoagulant, factor 8, protein C/S, antithrombin 3, t-pa, homocysteine, and hemoglobin. Statistical methods used were t-test and Chi-Square test for univariate study, and logistic regression analysis for multivariate study.
Results: The logistic regression analysis revealed that N group had significant differences in age (Coefficient (C) 0.232, Odds ratio (OR) 1.261, p-value (p) 0.009), BMI (C-0.459, OR 0.632, p 0.016), HbA1c (C 1.058, OR 2.880, p 0.009), HDL (C -0.207, OR 0.813, p 0.003), triglyceride (C-0.015, OR 0.968, p 0.025) compared to NN group.
Conclusion: Old age, diabetes mellitus, and undernourishment represented by lower values of BMI, HDL, and triglyceride were associated with the increased risk of ischemic necrosis of the legs in patients with CLI. From this study, it is suggested that to prevent the ischemic necrosis of the legs in CLI, nutritional support and blood glucose control are crucial especially in the elderly patients.

Keywords: critical limb ischemia, necrosis, vascular surgery, radiological intervention, hybrid vascular procedures

OP-093

Human Cord Blood-Derived Mesenchymal Stem Cell Therapy in Patients with Peripheral Arterial Occlusive Disease: Phase I Clinical Study

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Introduction: Half of patients with critical limb ischemia (CLI) are ineligible for revascularization at diagnosis. The aim of this study was to assess the safety and feasibility of intramuscular human umbilical cord blood-derived mesenchymal stem cell (hUCB-MSC) therapy in patients with CLI due to atherosclerosis obliterans (ASO) or thromboangiitis obliterans (TAO).
Methods: A total of eight patients (all male, median age 52 years, range 31–77) with CLI were enrolled in this phase I trial. All patients were considered ineligible for further revascularization to improve CLI. We injected 1 × 107 hUCB-MSCs per single dose intramuscularly into the affected limb.
Results: The primary end points of safety were occurrence of adverse events (procedure-related complication, allergic reaction to hUCB-MSCs, graft-versus-host disease, cardiovascular and cerebrovascular events) and improvement of symptoms/clinical parameters (healing of foot ulcer, ankle-brachial index, and pain-free walking distance). Angiogenesis was measured with conventional angiography and scored by an independent reviewer. There were four adverse events in three patients. One patient, developed whole body urticaria after injection on treatment day, which disappeared after one day of antihistamine treatment. The other adverse events included diarrhea, oral ulceration, and elevation of serum creatinine level; all conditions improved without treatment. Abnormal results of laboratory parameters were not detected in any patients. Three of four ulcerations (75%) healed completely. Angiographic scores increased in three of eight patients.
Conclusion: This phase I study demonstrates that intramuscular hUCB-MSC injection is a safe and well tolerated treatment for patients with end-stage CLI due to ASO and TAO.

Keywords: human cord blood, mesenchymal, stem cell, peripheral arterial occlusive disease, critical limb ischemia

OP-094

Neutrophil-Lymphocyte Ratio and the Platelet-Lymphocyte Ratio Predict the Risk of Amputation in Critical Limb Ischemia

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Türkiye Yüksek Ihtisas Hastanesi

Background: The objective of this study was to evaluate whether admission neutrophillymphocyte ratio and the platelet-lymphocyte ratio might reflect amputation in patients with critical limb ischemia who could not get surgical or radiological revascularization.
Methods: A total of 104 patients with non-reconstructable critical limb ischemia over a 5-year period were collected prospectively.
Results: Admission neutrophil-lymphocyte ratio levels of ≥3.2 and a platelet-lymphocyte ratio of ≥160 were found to represent the optimal cut-off values to risk stratification patients. If both levels were elevated (n = 28), patients had a median overall limb survival of 22 (95% CI = 6.2 to 37.8) months. If either neutrophil-lymphocyte ratio or platelet-lymphocyte ratio were elevated individually (n = 30), patients had a median limb survival of 36 (95% CI = 24.1 to 47.9)months. For cases where both levels were less than the cut-off values (n = 46), the median overall limb survival time was not reached but was greater than 60 months (log rank, p <0.001). Patients with a high risk showed the highest amputation (n = 16, 57%) as compared to low risk (n = 6, 13%) and intermediate risk (n = 9, 30%). This risk stratification was found to remain a significant independent predictor of survival on multivariate analysis (Cox, OR, 4.7; 95% CI, 1.7–12.6, P = 0.01) alongside diabetes mellitus (OR, 3.1; 95% CI, 1.1–8.3, P = 0.02), and chronic obstructive pulmonary disease (OR, 4.1; 95% CI, 1.3–13.4, P = 0.01).
Conclusions: Admission neutrophil-lymphocyte ratio and platelet-lymphocyte ratio both merit further evaluation as prognostic indices in patients with critical limb ischemia.

Keywords: ischemia, lymphocyte, neutrophil, platelet

OP-095

Platelet-Lymphocyte Ratio Predict the Risk of Amputation in Critical Limb Ischemia

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Background: The aim of this study was to PLR might represent significant prognostic indices in patients with CLI and might provide superior prognostic information.
Materials-Methods: One hundred and fourty one patients presented with CLI to our hospital between February 2007 and June 2012 who

could not have radiological or surgical revascularization and had medical treatment are included in our study. Eight patiens had excluded the study due to various reasons. 133 patients were included the study. Inclusion criteria were persistent rest pain for more than 2 weeks or ischemic skin lesions, ankle pressure below 50 mmHg or, in patients with diabetes and incompressible vessels, absent palpable ankle pulses or toe pressure below 30 mmHg. Primary end point was determined as amputation (limb survival) and all-cause death and separate analyses were performed.

Results: Out of the 133 patients in the study, 83.5% were male and 16.5% were female. There were a total of 28 (26.9%) deaths and 46 (34%) amputation over a mean follow-up of 46 months. The amputations were above ankle in 24 (77%), below ankle in 7 (23%). All patients were grouped in two, those undergone amputation and those without amputation. Diabetes mellitus, hemoglobine and platelet levels, mean PLR, PLR ≥ 160 were strong univariable predictor of amputation. These 4 variables were included in a multivariate regression modeling, diabetes mellitus (OR, 2, 9; 95% CI, 1.3–6, 5 P = 0.01), hemoglobin levels (OR, 0.9; 95% CI, 0.75–1.15, P = 0.5), platelet levels (OR, 1; 95% CI, 1–1.02, P = 0.6), PLR ≥ 160 (OR, 3.1; 95% CI, 1.2–7.4, P = 0.02) remained as independent factors associated with midterm amputation.

Conclusion: Significant prognostic information can be obtained from routine blood results in patients with CLI. Stratification of CLI patients according to admission PLR should be considered in the limb survival analyses of future adjuvant and neoadjuvant trials to validate these findings.

Keywords: ischemia, lymphocyte, platelet

Table 1

Risc factors	All patients N = 133	Non amputation N = 87	Amputation N = 46	Univariate OR	P
Age (years)	66.8 (33–91)	67.8 (42–91)	65.1 (33–89	0.98 (0.95–1.01)	0.24
Age >75 years	44 (33.1%)	30 (34.5%)	14 (30.4)	1.2 (0.56–2.59)	0.64
Male gender	111 (83.5%)	72 (82.8%)	39 (84.8%)	1.16 (0.44–3.1)	0.76
Diabetes	55 (41.4%)	27 (31%)	28 (60.9%)	0.29 (0.14–0.61)	0.001
Hypertension	61 (45.9%)	36 (41.4%)	25 (54.3%)	0.59 (0.29–1.2)	0.15
Hyperlipidemia	62 (46.6%)	42 (48.3%)	20 (43.5%)	1.2 (0.6–2.5)	0.6
Current smoker	90 (67.7%)	63 (72.4%)	27 (58.7%)	1.85 (0.87–3.9)	0.11
Chronic obstructive pulmonary disease	56 (42.1%)	34 (39.1%)	22 (47.8%)	0.6 (0.3–1.1)	0.14
Previous myocardial Infarction	33 (24.8%)	22 (25.3%)	11 (23.9%)	1.08 (0.47–2.47)	0.86
Stroke	17 (12.8%)	9 (10.3%)	8 (17.4%)	1.1 (0.3–4.2)	0.8
Previus vascular Surgery	34 (25.6%)	18 (20.7%)	16 (34.8%)	0.46 (0.2–1.03)	0.06
Previus stent	8 (6%)	5 (5.7%)	3 (6.5%)	0.95 (0.2–4.2)	0.95
Medical treatment					
Statin use	23 (17.3%)	13 (14.9%)	10 (21.7%)	0.78 (0.28–2.1)	0.63
ASA use	45 (33.8%)	27 (31%)	18 (39.1%)	0.62 (0.2–1.79)	0.37
Cilastazol use	92 (69.2%)	65 (74.7%)	27 (58.7)	0.8 (0.4–2.8)	0.5
Laboratory data					
Urea (mg/dL).	44.2 (19–128)	44.2 (23–128)	44.3 (19–119)	1 (0.98–1.02)	0.97
Creatinine (mg/dL)	1 (0.5–3.8)	1.1 (0.5–3.8)	0.9 (0.6–1.5)	0.38 (0.12–1.26)	0.11
Hemoglobin (mg/dL)	13.6 (7.9–19.2)	13.9 (7.9–17.3)	13 (9–19.2)	0.78 (0.65–0.95)	0.01
Platelet (103/mm^3)	325 (73–959)	298 (73–865)	374 (108–959)	1.02 (1.01–1.05)	0.02
Platelet (103/mm^3)	325 (73–959)	298 (73–65)	374 (108–959)	1.02 (1.01–1.05)	0.02
White blood cells (×109/L)	9.6 (3.9–24	9.2 (3.9–24	10.6 (4.2–19.9)	1.12 (1.01–1.25)	0.03
Neutrophil (×109/L)	7.1 (2.3–44.6)	6.8 (2.3–44.6)	7.6 (2.3–17.4)	1.03 (0.96–1.1)	0.41
Lymphocyte (×109/L)	2.2 (0.5–20.5)	2.4 (0.5–20.5)	1.9 (0.8-3.6)	0.7 (0.45–1.14)	0.16
PLR	171.4 (15.9–667)	151.3 (15.9–502.9)	208.9 (44.4–667)	1.05 (1.01–1.08)	0.01
PLR ≥160	58 (43.6%)	28 (32.2%)	30 (65.2%)	0.25 (0.12–0.54)	

Baseline characteristics of patients. divided according to amputation

OP-096

Treatment of Isolated Popliteal Artery Occlusion

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Introduction: The popliteal artery is a short vascular segment, but can be affected by various pathologic conditions. The aim of this study was to analyze the etiology and the treatments of isolated popliteal artery occlusion.

Patients and Methods: From March 2006 to February 2013, 35 patients were diagnosed with isolated popliteal artery occlusion.

Results: There were various causes for isolated popliteal artery occlusion: embolism (n = 17), atherosclerosis (n = 7), popliteal artery entrapment syndrome (PAES) (n = 5), trauma (n = 3), Buerger's disease (n = 2), adventitial cystic disease (n = 1). Except acute occlusions, the conditions of external compression and trauma, 17 patients were classified with chronic occlusion which included chronic thromboembolism (>2 weeks), atherosclerosis, and Buerger's disease. In 17 patients with chronic occlusion, the treatment methods were endarterectomy with patch angioplasty (n = 8), thrombectomy (n = 3), bypass or interposition grafts (n = 3), and endovascular treatments (n = 3). With mean follow-up 18.5 ± 11.68 (median 20, 1–42 months), reocclusion occurred in 4 patients among these patients. Two patients required balloon angioplasty a week and a month after endarterectomy, respectively. One patient was lost to follow-up after endarterectomy and required bypass surgery 2 years after the operation. One patient underwent repeated endovascular treatments, three times a year, for reocclusion. No patient experienced limb loss.

Conclusions: All possible etiologies should be considered for isolated popliteal artery occlusion. For chronic isolated popliteal artery occlusion, surgery of limited extent, such as thrombectomy or endarterectomy, is feasible. Careful surveillance with timely reintervention is crucial for successful outcomes in this patient population.

Keywords: popliteal artery, etiology, thrombectomy, embolectomy

OP-097

Effects of Combined Vasodilator and Antiplatelet Therapy on Patients with Raynaud Syndrome

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Introduction: Raynaud Syndrome (RS) is a common disorder, which affects young patients predominantly. Similar to diagnostic difficulties, low-effectiveness of treatment can cause severe functional impairment on RS patients. We aimed to analyze the efficiency of treatment with cold-stimulation test (CST), which was also analyzed as an objective screening test.

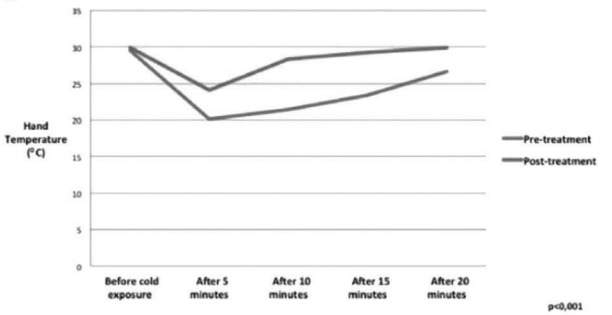
Material Methods: 91 patients with following symptoms; bruising, numbness and hand swelling, were admitted to our department last year. Demographic data, co-morbid diseases and patients' symptoms had recorded. CST was performed to all patients at pre-treatment and post-treatment period. Treatment was planned as a combination of the following molecules; Pentoxifylline 1200 mg/d bid, nifedipine 60 mg/d bid and acetylsalicylic aside 300 mg/d. Results were analyzed with SPSS for Mac 20.0 package program.

Results: 81 patients enrolled the study. All of patients were male and mean age was 22.3 ± 2.13 (19–29). 56 patients (69.1%) were smoker and one patient had controlled hypertension. Mean duration of symptoms from onset to present was 4.59 ± 2.83 years. Most common symptoms were bruising and coldness, respectively. Temperature changes in rewarming period after cold-exposure were shown in Figure Ia. There were statistically significant differences between pre-treatment and post-treatment hand temperatures measured by CST (p <0.001) (Figure Ib). There was no significant difference between pre-treatment and post-treatment hand temperatures before cold exposure, which was also meaningful (p >0.05).

Discussion: The tools and the screening tests for diagnosis and screening of RS were determined long before ago. However, there was a widespread belief that, these tools are ineffective. Similarly, it was believed that, the medications used in treatment of RS are not effective either. We consider that this study will clarify these

Figure I

a



Definition		n	Mean temperature (°C)	Standard deviation	t value	p value
Before cold exposure	Pre-treatment	81	29,56	1,95	-1,829	0,071
	Post-treatment	81	29,93	1,89		
After 5 minutes	Pre-treatment	81	20,05	3,47	-12,548	<0,001
	Post-treatment	81	24,08	2,96		
After 10 minutes	Pre-treatment	81	21,46	3,85	-19,842	<0,001
	Post-treatment	81	28,35	2,59		
After 15 minutes	Pre-treatment	81	23,40	4,34	-15,542	<0,001
	Post-treatment	81	29,28	2,41		
After 20 minutes	Pre-treatment	81	26,68	4,19	-8,721	<0,001
	Post-treatment	81	29,91	2,26		

Definition		n	Mean (minute)	Standard deviation	t value	p value
Rewarming time	Pre-treatment	81	26,67	9,68	14,526	<0,001
	Post-treatment	81	19,48	8,27		

a. Temperature changes after cold exposure, b. Comparing of hand temperatures and rewarming time at pre-treatment and post-treatment periods

myths. We conclude that, CTS can be an objective screening test, and the drug combinations, which were used in our study, are actually effective, even patients cannot be able to feel this effect objectively.

Keywords: cold stimulation test, raynaud syndrome, combined vasodilator and antiplatelet therapy vasospastic disorders

OP-098

Renal Stenosis Resulting from Fibromuscular Dysplasia and Its Surgical Treatment

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Aim: To evaluate the clinical characteristics and surgical treatment of renal stenosis resulting from fibromuscular dysplasia (FMD).
Methods: 22 cases from 1998 to 2012 were reviewed with average age 25.8 years old. Among them, all patients suffered refractory hypertension and only one presented renal dysfunction. We performed 2 aorto-renal bypass, 2 lesion resection and reconstruction, 15 balloon angioplasty and 4 stent implantation.
Results: There was no peri-operation mortality. 19 out of 22 cases underwent follow-up with no death. Significant decline of blood pressure (136.2 ± 14.3/83.7 ± 8.5 mmHg vs. 152.7 ± 16.7/95.2 ± 17 mmHg, p <0.01) and totally 100% effective rate were observed including 9 cured and 10 improved cases. The creatine level were preserved after surgical treatment (63.2 ± 24.5 umol/L Vs 67.9 ± 21.7 umol/L, P >0.05) with 4 cases improved and the other 15 stable. 17 patients received ultrasound surveillance with only one case of 20% restenosis.
Conclusions: Renal stenosis due to FMD are most common in children and youth with hypertension as major presentation. Balloon angioplasty is the first choice of surgical treatment with positive efficacy.

Keywords: renal artery obstruction, fibromuscular dysplasia, surgical treatment, balloon angioplasty, blood pressure

OP-099

Experimental Research of the Angiogenic Effects of Cilostazol

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GATA Kalp Damar Cerrahisi AD

Background: Cilostazol which is widely used in PAD, is a quinolone derivative that inhibits the phosphodiesterase III enzyme and as a result, platelet aggregation decreases and vascular dilatation occurs. The development of blood vessels, known as angiogenesis, is the basis of organ development and repair. The aim of this study was to research the angiogenic effects of cilostazol on the in vivo model of chick chorioallantoic membrane (CAM).
Materials-Methods: Cilostazol administered at the doses of 31.25 µg, 62.5 µg, 125 µg, 250 µg, 500 µg to Atak-S type 38 fertilized egg CAM at 5th day of incubation. After 24 hours of application angiogenic effects and after 48 hours of application antiangiogenic effects were assessed under a microscope.
Results: While there was no angiogenic effect, antiangiogenic effects were detected and scored. Results compared statistically with the control group results. When these findings evaluated dose independent, cilostazol was found to lead to statistically significant antiangiogenic effect by control group (p <0.05).
Conclusion: Further researches with other models of angiogenesis would be appropriate to reveal the clinical significance of cilostazol's antiangiogenic effects on CAM.

Keywords: angiogenesis, chorioallantoic membrane, cilostazol

OP-100

Evaluation of the Effect of Oxytetracycline Spray in Treatment of Diabetic Foot Ulcers

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Background: Prevalence of diabetes mellitus has increased significantly in last two decades. Among people with diabetes, 15% will experience a foot ulcer in their lifetime. Skin ulcers are the first appearance of the most diabetic foot complications which cause amputation. Although with appropriate treatment, 85% of amputations could be prevented. If we accelerate the healing of ulcers, both amputation and expenses such as hospitalization, rehabilitation, home and social Care and etc. will be prevented.
Method: In this interventional study, diabetic patients that hospitalized in vascular Surgery ward of Imam Reza hospital during 2009–2011, have been categorized into "empirical" and "Case" groups. Patients in both groups received the usual treatment of diabetic foot ulcer. In addition to that, patients in first group used Oxytetracycline spray (includes 4.2 gr Oxytetracycline, 420 mg Gentian Violet, 210 mg Ecipient q.s.) as well. Afterwards the processes of ulcers healing were compared, and characteristics of ulcers such as size, secretion, smell, erythema and edema between the two groups were evaluated.
Result: Result showed that there was a significant difference in decrease of size of the ulcers in second, third and fourth visits, improvement of purulent secretion in second and third, smell of ulcers in fourth, between "with spray" and "without spray" groups. But there was no significant difference in improvement of erythema and edema around the ulcers.
Conclusion: Usage of Oxytetracycline spray along with standard and current treatment of diabetic foot ulcers (grade 1 and 2 in

Wagner classification, B1 and B2 in Texas university wound classification) can improve the healing of ulcers by decreasing in size and purulent secretion and smell of ulcers.

Keywords: diabetic foot, wound healing, oxytetracycline

OP-101

Alendronate Changes Intracellular Calcium Dynamics by Affecting ATP-Sensitive Potassium Channels in Human Left Internal Mammary Artery

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Aim: Bisphosphonates, including alendronate, are widely used for the treatment of osteoporosis, hypercalcemia, and bone metastasis associated with cancer. However, recent evidence has demonstrated anti-atherosclerotic effects of bisphosphonates in animal models and atherosclerotic patients. Besides, some studies have shown that bisphosphonates change calcium homeostasis in cardiomyocytes and interfere L-type calcium channels in vascular smooth muscle cells. Therefore, in the present study we aimed to investigate the effects of alendronate on contractile responses and ATP-sensitive potassium channels *in vitro* in human left internal mammary artery (LIMA).

Material-Methods: Human LIMA rings were placed into isolated organ chambers. After resting period, rings were kept for an hour in incubation medium which contains alendronate (10–6 M) or not (control), and responses of the rings to the contractile agents were examined. The incubation period for two rings was performed in the presence of glybenclamide which is a ATP-sensitive potassium channel blocker (10–6 M).

Results: Maximum contractile responses of LIMA rings to noradrenalin and serotonin decreased in the presence of alendronate. In concomitant incubation of LIMA with alendronate and glibenclamide, glibenclamide reversed decreased contractions to noradrenalin or serotonin caused by alendronate. However, neither alendronate nor glibenclamide changed sensitivity to noradrenaline or serotonin.

Conclusions: Our findings point out that alendronate may change intracellular calcium dynamics in human LIMA, due to the activation of ATP-sensitive potassium channels which have an important role in intracellular calcium equilibrium.

Keywords: internal mammarian artery, aledronate, ATP-sensitive potassium channel

OP-102

Clinical Efficacy of Endovascular Therapy for Patients with Critical Limb Ischemia with Isolated Infrapopliteal Lesions

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Objective: Infrapopliteal angioplasty is routinely used to treat critical limb ischemia (CLI) despite limited data on its outcomes. This study reviewed our experience with infrapopliteal angioplasty in a small series of patients to determine its effectiveness as a treatment modality.

Methods: Data from all patients undergoing infrapopliteal endovascular therapy (EVT) for CLI, Rutherford category V and VI from April 2007 to March 2012 were reviewed with limb salvage rates as the primary outcome. This time period was chosen because it marks a paradigm shift in the primary management of infrainguinal occlusive disease from surgical bypass to percutaneous revascularization. The secondary analysis included restenosis, primary patency, reinterventions, survival and freedom from major adverse limb events with perioperative death (MALE + POD).

Results: Infrapopliteal angioplasty was performed on 314 infrapopliteal vessels in 223 limbs (85.2% male) with a technical success of 91%. In majority of the cases, anterior tibial artery was the target vessel for angioplasty (51.53%) followed by posterior tibial artery and peroneal artery (27.8% each). 83% of the patients were diabetic, 57.6% hypertensive, 30% had a previous history of coronary artery disease while 10% of the patients had chronic kidney disease. Multivessel interventions were performed in 30% of limbs. Mean follow-up was 6 months; MALE + POD was 4.4%, major amputation being performed on 10/223 limbs.

Conclusions: On the basis of these results, it can be stipulated that EVT should be considered initial therapy for patients with rest pain or tissue loss. Short-term clinical outcomes were acceptable after EVT for patients with CLI due to pure isolated infrapopliteal lesions. Although restenosis, reintervention, or amputation is high after tibial angioplasty for CLI, excellent limb salvage rates may be obtained with careful follow-up and reinterventions when necessary. Additional long-term follow-up and cost data are needed to thoroughly define the appropriate role for infrapopliteal angioplasty.

Keywords: infrapopliteal, angioplasty, amputation

Peripheral arterial disease 4

OP-103

A Ten-Year Analysis of Fatal Peripheral Vascular Injuries

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Aim: Peripheral vascular injuries are usually associated with fatal events. Early diagnosis and intervention are so vital for improving a favorable outcome for traumatic vascular injuries. As a preventable cause of death, we aimed to evaluate peripheral vascular injuries in overall deaths in ten years period, 2003–2012.

Methods-Results: A retrospective evaluation was made of 2845 death cases which had post-mortem examination and autopsy from the 10-year period of 2003–2012 in Eskisehir, Turkey. The mean age of the cases included in the study was 32.5 ± 7.9 years with the highest rate of cases occurring in the 30–39 years age group. Males constituted 89.2% of the victims. The most frequent manner of death was homicide 83.8%. The femoral artery was the most commonly injured vessel 29 cases (78.4%). In this study it was identified that, 33 patients (89.3%) died before any medical intervention could be performed.

Conclusion: In conclusion, our study shows that, peripheral vascular injuries most commonly caused by sharp objects. The injuries have a low mortality rate when early intervention is made. Autopsies are conducted is very important to explain not only the cause of death but also the treatment process, which would clear the cases of any potential malpractice or negligence claims.

Keywords: vascular injury, authopsy, femoral artery

OP-104

Outcomes and Assessment of the Revascularization in Patients with Critical Limbs Ischemia (CLI)

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Aim: To assess outcomes of revascularization in patients with CLI, and to clarify the problems for treatment in CLI patients.

Material-Methods: 135 CLI patients (155 limbs) underwent revascularization between April 2009 and May 2013. 110 limbs (71%) were graded as Fontaine 4. Preoperative ambulatory patients were 63%. Open surgery was chosen in 114 limbs (OS group), endovascular treatment was chosen in 41 limbs (EVT group). Preoperative factors, limbs salvage rate, survival rate, wound-heal rate were compared between two groups, and risk factors for amputation were analyzed.

Results: The proportion of preoperative ambulatory patients in OS and EVT were 70% and 37% respectively. Hemodialysis, dementia, Fontaine 4, high CRP were detected more frequently in EVT group. There was no significant difference in survival rate between two groups, but there was a tendency of better results in OS group in limbs salvage rate (OS vs. EVT 89.8% vs. 81.9%, p = 0.25) and wound-heal rate (OS vs. EVT 72.5% vs. 55.8%, p = 0.09). Of all cases, major amputation was performed in 13 limbs. The risk factors for major amputation were hemodialysis and high CRP.

Conclusion: Although our recent results of the revascularization in patients with CLI were acceptable, overcoming CLI with infection on hemodialysis is the subject in the future.

Keywords: PAD, CLI, revascularization

OP-105

Surgical Experience in Gun Shot or Shell Fragments Wounds

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Introduction: A lot of gun shot wounds coming to Turkey because of the ongoing civil war in Syria. The common features of these patients are the lack of basic medical intervention and late attempting to hospital. As the mean ischemic time is decreasing, mortality and morbidity rates are decreasing too. Second world war, Korea

and Vietnam experiences vascular traumas were results with amputation, today amputation rate is very rare.

Purpose: Patients who attempt our hospital, diagnosed with vascular trauma by gun shot or shell fragments at civil war in Syria were evaluated and the factors associated with mortality were identified.

Methods : Data of 22 patients operated upon following a diagnosis of vascular trauma by gun shot or shell fragments at civil war in Syria between September 2012–July 2013 was analyzed prospectively.

Results: 19 (86.4%) male and 3 (13.6%) female patients were studied with an average age of 28.05 ± 6.28 years. Mean time admission to hospital after the event happened was 15.55 ± 15.60 hours. The in-hospital mortality was 4 (18.2%). The most important factor associated with mortality was presence of preoperative shock and intubation (p: 0.001). Admission time is not significant on mortality rate. The amputation rate was 4.5% in only 1 patient with abundant bleeding after operation.

Conclusion: Our study has shown that preoperative clinical findings affect the mortality associated with vascular trauma. The basic medical intervention will help further reduce mortality rates.

Keywords: vascular trauma, ampuation, war

OP-106

Association of CYP2C19 Genotype with Clinical Efficacy of Clopidogrel Therapy

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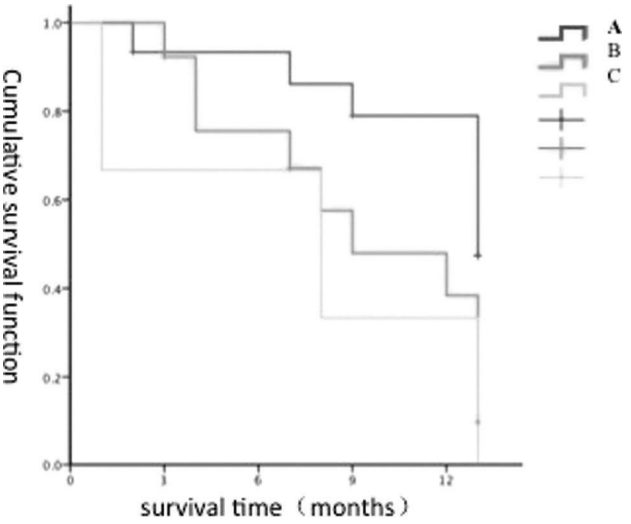
Aim: The purpose of this study is to evaluate the association between the CYP2C19 genotype and the antiplatelet effect of clopidogrel therapy, and also analyze the value of them in predicting the risk of long-term ischemic events after endovascular treatment of ASO patients.

Material-Methods: From the Januray 2011 to the September 2012, a total of 62 patients with arteriosclerosis obliterans after stent implantation (TASC A~C) in the SFA were included. After at least 5 days' standard dual-antiplatelet therapy, we analyzed the relationship of single nucleotide polymorphisms within genes modulating clopidogrel metabolic activation (CYP2C19*2, CYP2C19*3) using DNA Real-time Quantity PCR, and also assessed the response of clopidogrel and asprin measured by thromboelastogram (TEG-PM). By the 31 cases during 1 year of follow-up, we observed the ABI changes to evaluate the symptoms and assessed the stent patency degree by the Ultrasound, CTA or DSA if necessary. The study used Kaplan-Meier analysis to reveal the association among CYP2C19 genotype, the different platelet responsiveness and the long-term ischemic events in the lower extremity after endovascular treatment. A P value <0.05 was considered statistically significant.

Figure 1



The survival curves of the fast (A), the moderate (B) and slow metabolic (C) CYP2C19 gene

Results: Kaplan-Meier survival analysis showed high platelet reactivity patients during clopidogrel therapy was associated with ischemic events (p = 0.010). The carriers of one or two CYP2C19 loss-of-function alleles were related to the post-clopidogrel platelet aggregation according to the Spearman's correlation analysis (p = 0.027). Patients with one or two CYP2C19 loss-of-function alleles, compared with non-carriers, were associated with higher risk ischemic events or death during 1 yearís follow-up in the Kaplan-Meier survival analysis (p = 0.033).

Conclusions: Among the patients with arteriosclerosis obliterans after stent implantation, CYP2C19 genotype and high platelet reactivity during clopidogrel therapy, are associated with the later ischemic events and can predict the risk of adverse events in high-risk patients.

Keywords: CYP2C19 genotype, arterosclerosis obliterans, clopidorel, platelet reactivity, TEG-PM

OP-107

Surgical Treatment of Lower Limb Ischemia in Diabetic Patients—Long Term Results

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Background: Lower limb ischemia may cause unhealing ulcers, infection, amputation and even mortality in diabetic patients. The

effectivity of distal arterial bypass procedures were evaluated in this study.

Patients and Methods: From March 2004 to September 2008, 83 patients with lower limb ischemia in Fontaine Class III and IV underwent distal arterial bypass procedures. Saphenous vein grafts were used for below knee arterial bypasses in all patients. In 16 (19%) patients femoropopliteal bypasses were performed with PTFE graft. Short term and long term surgical results were evaluated.

Results: Ulcer recovery was determined in 36% of patients. Graft patency was 95% and 1 mortality (1%) occured in short term follow up. In long term follow up total effectiveness rate was 74%. Graft patency was 79% and 6 mortality (7%) occured during the follow up.

Conclusion: Distal arterial revascularization is considerably an effective procedure with acceptable graft patency and limb salvage rates in diabetic patients with critical limb ischemia. Further studies are warranted to prevent ischemic feet, interventional measures and better graft patency rates in this patient population group.

Keywords: diabet, distal arterial bypass

OP-108

Hybrid Approach with Using Open and Endovascular Surgery to Multilevel Peripheral Arterial Lesions

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Background: Vascular surgeons face more often with multilevel peripheral arterial stenosis or occlusion as the life expectation and the average age is increasing in society. For the treatment of these type of lesions endovascular methods can be used with open surgical techniques (hybrid approach).

Methods: Hybrid approach was used in 38 patients between January 2005 and December 2011 in Şişli Florence Nightingale Hospital Vascular Surgery Department for multilevel peripheric atherosclorotic occlusive disease. The patients average age was 68.1 (48–98) and 29 of them was male and 9 of them was female. 19 patient (50%) had clodicatio under 100 meter, 14 patient (36%) had pain at rest and 5 patient (14%) had wound at distal. Iliac transluminal angioplasty and/or stenting and femorofemoral bypass was performed in seventeen patients (46%), iliac transluminal angioplasty and/or stenting and femoropopliteal bypass was performed in 15 patients (39%), femoropopliteal bypass and tibial transluminal angioplasty was performed in two patients (5%), superficial femoral artery transluminal angioplasty and popliteotibial bypass was performed in two patients (5%) and iliac transluminal angioplasty and femorotibial bypass was performed in two patients (5%).

Results: One patient (2.6%) had extremity loss (under knee amputation) and 6 patients (15.7%) had minor finger amputation. We did not see any early mortality among these patients.

Conclusion: The results of the treatment of multilevel peripheral atherosclorotic stenosis or occlusion using open surgery with endovascular techniques at the same time (hybrid approach) is gratifying. Hybrid vascular approach can be done successfully by the vascular surgeons who had elementary endovascular education.

Keywords: multilevel occlusive arterial disease, angioplasty, hybrid approach

OP-109

Early Experience of Hybrid Operation in Patients with Critical Limb Ischemia and Atherosclerosis

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Objective: The purpose of vascular surgery is to prevent amputation and maintain walking ability. Many surgical techniques for peripheral vascular disease have been reported. The hybrid operation, which combined open surgery and endovascular procedure, have been increasingly used for multilevel revascularization. The goal of this study is to evaluate feasibility of hybrid operation in patients who need multilevel revascularization.

Material and Methods: Between March 2011 and December 2012, twenty-two consecutive patients (34 limbs) were treated for critical limb ischemia (CLI) using hybrid operation by single surgeon. The hybrid operation was simultaneously performed for multilevel revascularization. Pathologic lesions were classified by the Trans-Atlantic Society Consensus II (TASC II) A/B/C/D. The measurements of primary outcome were technical success and limb salvage rates. Patients undergone single endovascular procedure or open surgery were excluded.

Results: The mean age was 70.64 years old and 86.4% were male. The technical success rate was 100%, and the limb salvage rate was 97.1%, which 1 out of 34 limbs was performed major amputation. There was no mortality.

Conclusions: The hybrid operation for multilevel revascularization may be feasible to treat CLI with high technical success and limb salvage rates, thus providing an attractive alternative to larger open surgery or endovascular procedures.

Keywords: hybrid operation, critical limb ischemia, revascularization, TASC II

OP-110

Mid-Term Results of Surgical and Endovascular Treatments in Takayasu's Arteritis

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Background: Takayasu's arteritis (TA) is first described in 1908 by a Japanese ophthalmologist, Mikito Takayasu. It is a disease of unknown etiology primarily resulting from effects on the aorta and its branches. We present mid-term results of 20 patients who underwent surgery or endovascular intervention due to TA.

Methods: Between January 2003 and January 2011, 20 patients with TA underwent surgery or endovascular intervention in our clinic. Symptoms and findings were upper extremity ischemia (n = 10), upper extremity hypertension (n = 7), lower extremity claudication (n = 5), subclavian steal (n = 5), syncope (n = 2), vertebro-basillary insufficiency (n = 2), and visual disturbances (n = 1).

Of the 20 patients, 13 underwent surgery, 6 underwent endovascular intervention, and 1 underwent hybrid approach.

Results: Restenosis was observed in 6 patients. Aneurysm occurred on right distal anastomotic site of the aorto-bifemoral graft in 1 patient who underwent surgery due to atypical aort coarctation. Transient ischemic attack occurred in 1 patient on 48th day of the endovascular intervention to the left carotid artery. There was no mortality in our cases.

Conclusion: Both surgical and endovascular approaches are commonly used techniques in TA. Restenosis rates of these interventions are similar. Choice of treatment option is up to preferences of the lesion and experience of the surgeon.

Keywords: Takayasu's arteritis, surgery, endovascular intervention

Arterial involvements and performed interventions

Table – 1: Distribution of arterial involvements

Type	Patients (n)	Involved Arteries	Patients (n)
I	12	Left subclavian artery	6
		Right subclavian artery	2
		Left carotid artery	2
		Right carotid artery	1
		Right vertebral artery	1
II	5	Abdominal aorta	4
		Descending aorta	1
III	2	Descending aorta + right subclaivan artery	1
		Descending aorta + left vertebral artery	1
IV	1	Left subclavian + main pulmonary artery	1

Table – 2: Performed interventions

Involved Arteries	Patients (n)	Intervention	n
Left subclavian artery	6	Axillo-axillary bypass	5
		Carotico-subclavian bypass	1
Right subclavian artery	2	Axillo-axillary bypass	1
		Carotico-axillary bypass	1
Left carotid artery	2	Baloon angioplasty and stent	2
Right carotid artery	1	Baloon angioplasty and stent	1
Right vertebral artery	1	Baloon angioplasty and stent	1
Abdominal aorta	4	Aorto-bifemoral bypass	2
		Aorto-aortic bypass	1
		Axillo-bifemoral bypass	1
Descending aorta	1	Tube graft interposition	1
Descending aorta + right subclavian artery	1	Tube graft interposition + Baloon angioplasty and stent	1
Descending aorta + left vertebral artery	1	Baloon angioplasty and stent	1
Left subclavian + main pulmonary artery	1	Baloon angioplasty and stent	1

OP-111

Complete Revascularization of Below the Knee Lesion Using Great Saphenous Vein Y-Graft in Critical Limb Ischemia

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Background: Critical limb ischemia requires optimal revascularization to keep improving quality of life. However, other treatment modality except surgery showed poor midterm outcomes in the BTK lesion. We evaluate the early results of complete BTK and pedal bypass using the great saphenous vein Y-graft (Y-graft PABS).

Method: From July 2008 to December 2012, a total of 31 diabetic foot patients (28 males and 3 females, mean age 69.5 (51–82) years old, 37 limbs) underwent Y-graft PABS. The early clinical results of mortality, major morbidities and limb salvage rate were retrospectively analyzed.

Results: Preoperatively, 20 patients had cardiac problems, 13 patients revealed pulmonary problems (FeV1 <50%). 18 cases of concomitant proximal bypass were simultaneously combinded. 6 above knee popliteal artery and 25 below knee popliteal arteries were proximal anastomosis location. Distal target points were both dorsalis pedis artery (DPA) and far distal posterior tibial artery (dPTA). There was one early mortality suspected to post operative heparin induced thrombocytopenia type II. Major mobidities were 4 cases of acute renal failure requiring CRRT and one case of ECMO insertion due to the respiratory failure. During mean 24 month of follow up periods, there was no amputation except one toe necrosis. All graft except two of targeting to the DPA was remained intact state. Major complications were statistically associated early post-operative BNP value.

Conclusions: Complete BTK bypass using GSV Y-graft in critical limb ischemia patients showed excellent clinical results and can be performed with technical feasibility. Thorough preoperative evaluation of the cerebral, cardiac, pulmonary and renal function is mandatory. BNP levels might represent the patient down-hill course and in this situation, relevant next steps (ex, ECMO, CRRT) can save the lives. Also, pedal artery bypass surgery should be applied aggressively to the patients in terms of both limb salvage and quality of life.

Keywords: below the knee bypass, critical limb ischemia

OP-112

Perioperative Antiplatelet Agent Keep on Strategy in Lower Limb Bypass Surgery Decrease Graft Failure Rate Without Significant Bleeding Risk

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Backgrounds: It is unclear whether perioperative Antiplatelet agent keep-on strategy in lower limb bypass surgery is risk or not. We tried to evaluate the clinical effects and risks for this strategy.
Method: From 2007 to July 2013, a total of 212 lower limb bypass surgeries were retrospectively analyzed. Mean age was 69.1 ± 9.3 with males of 188 (88.7%). 104 patients (49%) underwent single bypass, 27% of them underwent double bypass surgery and 13 (6.1%) underwent more than three procedures. 18.8% of patients experienced concomitant endarterectomy and/or angioplasty. Vein grafts were used in 126 (59.4%) of cases. Others underwent bypass surgery with artificial graft or composite conduits. Aspirin with or without clopidogrel has not been discontinued on 133 (62.7%) patients during perioperative period (Antiplatelet group). In Conventional group, 37.3%, antiplatelet agent was discontinued at least 3 days before surgery.
Results: There was no statistical differences between two groups in terms of preoperative demographics such as, age, Rutherford class, v-POSSUM score, operated limb numbers, procedure numbers, grafts and follow up periods. However, past history of cerebrovascular accidents rate was higher in antiplatelet group. In Conventional group, bleeding rate were lower, but it was not statistically significant (0% vs. 3.8%, p = 0.09). Other complication rate and 30 days mortality and morbidity rate were also comparable in both groups (4.8% of Antiplastelet group vs. 9.1% of conventional group). 66% of antiplatelet agent group underwent spinal anesthesia. In conventional group, late graft failure rate was significantly higher (5% vs. 40%, p = 0.01). In multivariated analysis, not use of antiplatelet keep-on strategy was main risk factor for graft occlusion (p = 0.015, Exp(B) = 27.474).
Conclusions: In lower limb bypass surgery, antiplatelet agent keep-on strategy might increases bleeding complication rate but can improve the graft patency. This strategy can make a good surgical option to selected patients group.

Keywords: perioperative antiplatelet, lower limb bypass, graft latency

OP-113

Thrombectomy of Acute Peripheral Vascular Occlusions Using the ThromCat XT Device in Patients with Atrial Fibrilation

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Objective: Percutaneous mechanical thrombectomy and catheter aspiration have become accepted alternative method for recanalization of acute arterial occlusions. In this study, we aimed to examine the effect of thrombectomy in patients with acute arterial occlusions due to atrial fibrilation, using the ThromCat XT device, a new rotational thrombectomy system.
Methods: From May 2013 to August 2013, nine patients with acute arterial occlusion due to chronic permanent atrial fibrilation were enrolled in this study. The mean age was 72 ± 8 years. Rutherford classification scheme for acute limb ischemia was used. In preoperative examination, five of patients were classified in Rutherford Class IIA, others Class IIB. All femoral artery pulses were palpated. All of the patients were underwent MR angiographic procedure before and after thrombectomy. Vessel and lesion characteristics were summarized in the table (Table 1). Under local anesthesia, ThromCat XT system was used for thrombectomy via 6F femoral artery catheter.
Results: The recanalization was technically and clinically successful in eight of nine cases. One patient was underwent open surgical thrombectomy because of ineffective puncture of femoral artery. In postoperative examination, seven of patients were classified in Rutherford Class I, others Class IIA. After thrombectomy, atrial thrombus was detected in two patients in the course of echocardiograhic examination. All patients were discharged on the 1th postoperative day uneventfully except two patients with atrial thrombus. They were referred to a cardiac surgery center. During one month follow up, massive ecchymosis was occured in 4 patients, recurrent acute arteriel occlusion was occured in one patient. Femoropopliteal bypass was applied to this patient with using saphenous vein graft.
Conclusions: Use of ThromCat XT in acute arterial occlusions is safe and feasible. ThromCat XT is a valuable adjunct in treatment of acute arterial occlusion.

Table 1. Vessel/lesion characteristics

Vessel characterstics	Median	Mean	Standara deviation	Range
Vessel diameter mm	5	5, 2	± 1.54	2.5–8.0
Diameter stenosis %	99, 7	100	± 1.7	90–100
Treatment length mm	45	60	± 52.0	20–120
Vessel tortuosity	n		%	
None	4		44.4	
Mild	5		55.5	
Thrombus age				
Acute = 24 hours	9		100	

Keywords: thrombectomy, atrial fibrilation, arterial occlusive diseases

Peripheral arterial disease 5

OP-114

Simultaneous Hybrid Revascularization for Symptomatic Lower Extremity Arterial Occlusive Disease

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Introduction: The multilevel involvement is the typical finding of peripheral arterial occlusive disease. Hybrid procedures allow more complex anatomy to be treated by less invasive procedures in medically higher risk patients.
Method: All consecutive patients with symptomatic chronic limb ischemia who underwent revascularization either by open surgery (OPEN group) and combination of open surgery and endovascular procedure (HYBRID group) were retrospectively analyzed from our prospectively collected database. All procedures (hybrid, open) were performed by vascular surgeon in the operating room. The postoperative surveillance was made in outpatient clinic at 3 and 6 months and every 6 months thereafter. For statistical analysis, data was analysed using SPSS 19.0 software (IBM Corp, Chicago, Ill). All P values were considered significant if <0.05.
Results: A total of 76 patients were included. The mean age was 67.1 ± 11.3 years (range; 42~94). The male-to-female ratio was 67:9. The most common indication for revascularization was Rutherford category IV (resting pain). Hypertension was the most common comorditiy. The most common hybrid procedure was the combination of femoral endarterectomy and iliac stenting. The immediate technical success rate of hybrid surgery was 90.5%. The ipsilateral ABI increased from 0.53 ± 0.21 to 0.75 ± 0.16 in hybrid group with statistical significance. The overall limb salvage rate was 97.4%. The primary patency rate of hybrid group and open group was (P = 0.441). Secondary patency rate showed similar result (P = 0.621).
Conclusion: Hybrid procedures is feasible option for multilevel peripheral arterial occlusive disease with favorable patency and limb salvage. Simultaneous hybrid approach may have many advantages when it is compared with staged operation such as shorter hospital stay, safe and increased satisfaction of a patient. Femoral endarterectomy plays an important role in hybrid surgery.

Keywords: hybrid, endovascular procedures, revascularization, lower extremity, artery

OP-115

Autologous Bone Marrow Cell Implantation in Critical Limb Ischemia

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Aim: Currently, critical limb ischemia can be managed by either surgical or endovascular strategies. However these therapy modalities are limited in patients with diffuse arterial occlusive disease below the knee. Autologous bone marrow cell implantation can be a last resort treatment in these patients with promising results.
Material-Methods: Autologous bone marrow cell implantation was performed in 20 patients with critical limb ischemia (mean Rutherford class 4.3 ± 0.56). Under local anesthesia, 240 ml bone marrow was aspirated from iliac crest. A fully automated bedside density gradient centrifugation method was used to prepare a concentration of bone marrow total nucleated cells (BM-TNC) from the aspirate (Harvest SmartPReP, Harvest Technologies, Plymouth, MA, USA). Forty to eigthy aliquots of about 0.5–1 ml were injected deep intramuscularly with a 23-gauge needle into the thigh, calf or foot depending on the localization and extent of the arterial occlusions. 4–10 injections were given into the wound bed and the wound perimeter if present.
Results: The mean age of patients was 52.7 ± 10.76 years. The mean walking distance without pain was 11.11 ± 15.59 meters and the mean ankle brachial index (ABI) was 0.47 ± 0.35 before the procedure. At 6th month after the procedure the mean ABI of the patients was found to be increased to a mean of 0.80 ± 0.37. The mean walking distance without pain was also found to be increased to 329.1 ± 352.8 meters.
Conclusion: Patients with diffuse distal vascular disease are often managed medically with unsatisfactory results. Autologous bone marrow cell implantation performed in this group of patients may be a promising treatment option with significant improvement in patient symptoms and walking distance.

Keywords: peripheric artery disease, stem cell, critical limb ischemia

OP-116

Management of Blunt Peripheral Arterial Injury

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Background: Angiography is the "gold standard" diagnostic tool for patients presenting soft signs of arterial injury. To reduce the number of unnecessary angiographies, we aimed to evaluate the role of the ankle brachial pressure index (ABPI) in the diagnosis of peripheral arterial injury in extremity trauma with soft signs.

Methods: The data of 886 patients with the suspicion of peripheral arterial injury was recorded prospectively. 142 patients (16%) with any hard sign underwent immediate surgery. ABPI was calculated in 745 patients with soft signs. Patients with ABPI > or = 1 were followed up conservatively.

Results: 671 (90%) patients had ABPI > or = 1; three (0.5%) of them developed symptoms and signs of arterial injury and healed without morbidity. 73 (10%) patients had ABPI <1; with DUS/angiography, arterial injury was detected in 19 of them (26.7%), and they underwent surgery. The sensitivity of ABPI <1 was 84.8%; specificity 92.6%; positive predictive value 26.7%; negative predictive value 99.5%; and overall accuracy 92.3%.

Conclusion: ABPI excludes arterial injury in 99.5% of patients with soft signs of arterial injury and avoids unnecessary examinations in 90% of patients. In the management of extremities with soft signs, ABPI measurement should be the first-line diagnostic choice.

Keywords: trauma, peripheral arterial ınjury, ankle brachial pressure index

OP-117

The Effects of Epidural Anesthesia on Acute Limb Ischemia Reperfusion Injury in the Rabbit Model

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Background: Acute lower extremity ischemia is the important part of the vascular surgery cases and it causes serious morbidity and mortality. In this study, it was aimed to investigate the effects of epidural anesthesia on acute lower extremity ischemia reperfusion damage.

Methods: Thirty six male New Zeland rabbits were randomized into four groups either as sham (n = 9), IR (n = 9), IR + epidural treatment (n = 9) and epidural treatment control (n = 9). IR model was exposed to 150 minutes of ischemia and 120 minutes reperfusion by right lower extremity femoral artery clamping and with tourniquet. Epidural lidocain was given a bolus dose, followed by continuous infusion throughout the total IR period. At the end of the total IR period, blood sampling for measurement of interleukin 6 (IL-6), tumor necrosis factor-a (TNF-a), gastrocnemius muscle sampling for measurement of malondialdehyde (MDA), superoxide dismutase (SOD) and femoral artery and gastrocnemius muscle sampling for histopathological examination were performed.

Results: Compared with the other groups, muscle MDA levels were higher in IR group and it was statistically significant (p <0.05).

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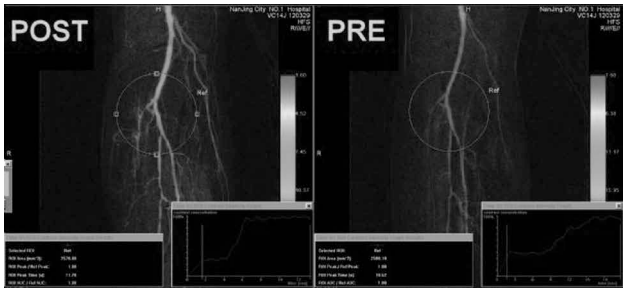

In this case, the endo-vascular treatment of superficial femoral artery largely decreased the peak time around popliteal artery bifurcation from 18.62 s to 11.70 s. Left: iFlow measurement after treatment. Right: iFlow measurement before treatment.

Conclusion: As a result of this experimental study, it could be said that epidural anesthesia reduce the acute lower extremity ischemic reperfusion damage.

Keywords: acute lower extremity ischemia, epidural anesthesia, ischemia reperfusion injury

OP-118

Angiographic Endpoint of Intervention for Periphery Arterial Occlusion Disease: A Study of Quantitative Digital Subtraction Angiography

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Purpose: To investigate the measurement of color-coded quantitative DSA (qDSA) of distal arteries for objective assessment of the endpoint of interventional treatment for patients with steno-occlusive arterial disease in lower limb.

Method and Materials: From March 2012 to August 2012, 18 patients who received stent placement or balloon dilatation in their superficial femoral artery were recruited. Peri-therapeutic DSAs of all patients were performed with the same protocol. Based on qDSA images, time to peak (TTP) of regions selected at common femoral artery bifurcation, popliteal artery bifurcation (PA), and dorsal pedal artery (DPA) were measured independently by two experienced physicians. The relative TTP of the contrast media bolus reaching these arteries were analyzed to detect the physiological changes resulting from the intervention and to verify the reproducibility of the method.

Results: 16 out of 18 DSA series were successfully post-processed by qDSA software. With respect to the region of the common femoral artery bifurcation, the pre- and post-procedural relative TTP were 8.033 ± 4.038 and 5.202 ± 2.423 for the PA region, while 17.379 ± 6.170 and 10.246 ± 4.636 for the DPA region, respectively. There were significant differences ($P < 0.05$) between the pre- and post-procedural relative TTP of the PA region ($t = 2.404$, $p = 0.023$) and the DPA region ($t = 3.746$, $p < 0.001$). Intra-class correlation coefficients between the two observers were 0.952 and 0.842 for PA and DPA regions, with 95% confidence interval of 0.901 to 0.976 and 0.654 to 0.925, respectively.

Conclusion: The relative TTP reaching the above mentioned distal arteries were significantly reduced by interventional treatment of superficial femoral artery. The measures of three regions showed a high degree of reproducibility between different users, our study showed that qDSA provided a reliable way to objectively assess the endpoint of intervention treatment for steno-occlusive arterial disease. Future studies should be conducted to gain and analyse more data to further proof our method.

Keywords: periphery arterial occlusion disease, therapy interventional, quantitative digital subtraction angiography

OP-119

To Induce Therapeutic Angiogenesis by Injecting Autologous Peripheral Stem Cells in Non Reconstructable CLI

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Army Hospital

Aim: To induce therapeutic angiogenesis by injecting autologous peripheral stem cells in non reconstructable CLI.

Method: Grade III or IV Fontaine PAOD patients with non-reconstrucatble disease on angiography, were consented to receive G-CSF 300 ug bd. CD34+cell counts were taken every day from 3rd day till 5th day. The day an increase of ratio to ≥ 0.10 was seen, G-CSF treatment was stopped and peripheral blood stem cells were harvested. 40–60 ml of cell suspension prepared was then injected into the ishaemic muscle.

Results: 20 patients with mean age of 49.7 years (32–65 yrs), with DSA proven, non-reconstructable, infragenicular occlusive disease, underwent successful harvesting and treatment in a two year period. The concentration of total viable mononuclear cells in final suspension was 3.873 ± 1.849 × 108/ml. At 6 months no major amputation, 3 minor amputations were done and 9 of the 12 ulcers had healed.

The ischamic rest pain on numerical rating scale decreased significantly from a mean of 7.5 at baseline to 3.5 at 6 months (Paired samples *t*-test, $p < 0.001$)

The mean preprocedural ABI increased from 0.47 to 0.73 at 6 months ($p < 0.001$). Baseline mean TcPO2 increased from 27 mm Hg to 35 mm Hg at the end of 6 months ($p < 0.001$). New collateral vessel development at 6 months was seen in 20% of patients. Only 3 patients had minor adverse events.

Conclusion: Intramuscular application of EPC's after G-CSF stimulation is safe and feasible and improves clinical outcome as measured by ABI, TcPO2, ulcer healing, angiographic scores, and pain reduction.

Keywords: critical limb ischemia, stem cells, therapeutic angiogenesis

OP-120

Vein Quality is Strong Influence to Distal Bypass Graft Patency in Patients with Dialysis

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Purpose: Long-term patency of distal bypass grafts is compromised by venous neo-intimal hyperplasia. The aim of the study is

to determine relationship between perioperative evaluation of vein quality and clinical results of distal bypass.

Material-Methods: A total of 349 consecutive critical ischemic limbs in 318 patients who underwent distal bypasses from 2003 to 2011 were reviewed. A total of 49% of patients had dialysis-dependent renal disease (end-stage renal disease, ESRD) and 81% of patients were diabetic, and distal targets of bypasses were the crural artery (57%) and the pedal artery (43%). Vein grafts were implanted in single vein 65%, spliced vein 35%. To evaluate vein quality, we checked vein diameter, extensibility and assigned three category as poor is 2.5–2.9 mm vein diameter, fair is 3–3.9 mm, good is 4–5.9 mm.

Results: The overall cumulative primary and secondary patency rates of bypass grafts were 61.4%, and 86.5% at 2 years, respectively. Cumulative primary patency rates of good quality vein graft and poor quality vein grafts were 94%, 68% ($p < 0.01$) at 2 years. And loss of primary patency within 30 days was observed in poor quality grafts ($p < 0.001$). There were no significant differences between ESRD and non-ESRD patients in perioperative vein quality and cumulative graft patency rate. Spliced vein graft ($p < 0.001$), poor quality vein graft ($p = 0.003$), poor walking ability (<0.001), heart failure ($p = 0.012$) were strong predictor of 2 years graft failure.

Conclusions: Vein quality was strong predictor of early and 2 years graft failure. The perioperative evaluation of vein quality was usable for graft surveillance and treatment strategy.

Keywords: vein quality, distal bypass, graft patency, dialysis

OP-121

Effect of Tikagrelol on Neointimal Hyperplasia in a Rabbit Carotid Anastomosis Model

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Objective: The aim of the study was to investigate the effects of tikagrelol, on neointimal hyperplasia in rabbit carotid anastomosis model.

Methods: A total of 20, six-month-old, New Zealand white young female rabbits (2300 ± 300 g body weight) were used in this experimental study. After anaesthesia, the right carotid artery of each rabbits were transected and both ends anastomosed.Rabbits were divided into four groups of five animal search: T1 (tikagrelol: 5 mg/kg, po, daily), T2 (tikagrelol: 10 mg/kg, po, daily), T3 (tikagrelol: 20 mg/kg, po, daily), and C (control).

After the sacrification, right and left carotid artery were isolated.Arterial sections were evaluated histomorphologically and immunohistochemically with staining using antibodies against trasforming growth factor.

Results: In the control group, the intima/media ratio was significantly higher than the controlateral normal artery.In the tikagrelol groups ($p < 0.05$), this ratio had significantly decresed when compared with the control group ($p < 0.05$).

Conclusion: The results of our study suggest that tikagrelol, which is used as antiplatelet treatment options in clinics, can prevent the development of intimal hyperplasia.

Keywords: tikagrelol, intimal hyperplasia, rabbit

OP-122

The Mid-Term Result of Surgical Treatment of Coronary Subclavian Syndrome

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Aim: In this retrospective study, we assessed the results of extra-anatomic bypass in patients who were performed CABG previously with patent ITA graft for subclavian artery revascularization.

Material-Methods: Between May 2009 with December 2012, 8 patients (5 males, 3 females; mean age 58.1 years; range 44 to 66 years) who underwent extra-anatomic bypass for subclavian artery and ITA were included in this study. All patients had angina pectoris and convensional angiography was done in all. All of the ITA grafts were patent.

Results: Surgical treatment was performed by using carotico-subclavian bypass (CSB) procedure on 5 of the patients and by using subclavian to subclavian bypass (SSB) procedure on 3. Subclavian artery endarterectomy was performed simultaneously in one patient. While 4 PTFE and 1 dacron graft were utilized in CSB and 2 PTFE and 1 saphenous vein graft were utilized in SSB. Early period (the first 30 days after surgery) primary graft patency was 100%. Two grafts which were utilized in SSB were occluded at the 4th and 22th months. The primary patency rates in the CSB group were 100%. There has been no cerebrovascular events in patients. One patient who was performed CSB (12.5%) was died at 12th day after surgery because of the myocardial infarction on circumflex artery area. This patient graft was patent.

Conclusion: ITA should be revascularized in coronary subclavian steal syndrome. CSB may be preferred as a more effective, safe and easily applicable method for appropriate patient profile with high patency rate and low postoperative risk.

Keywords: coronary subclavian steal, subclavian stenosis

OP-123

Percutaneous Transluminal Angioplasty and Stent Placement of Peripheral Arterial Diseases

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Purpose: To evaulate the safety and efficiency of peripheral angioplasty (PTA) and stenting in semptomatic and high risk patients with peripheral arterial disease (PAD).
Materials-Methods: Between January 2012 and July 2013, 15 patients (2 female), median age 71 (36–91) years underwent aorto-iliac and femoro-popliteal PTA and stenting. A total of 18 stents were placed. Indications were intermittent claudication in 11 and rest pain, ulceration or gangrene in 4. Sites stented were common iliac artery 2, external iliacartery 5, common femoralartery 3, süperficial femoral artery 8. PTA and stenting were performed all of the lesions. We have used the self expandable cover stent in aorto-iliaclesions and balloon expandable nitinol/steel stent in femoro-popliteal lesions.
Results: Technical success was 100%. Residual stenoses were corrected by PTA. Minimal access site hematoma was occured in two patients and majör access side hematoma in one. Mean follow-up time was 9 months. Primary patency was 100% at the times of following.
Conclusion: PTA and stenting of PAD can be safely achieved with durable results. Especially in high risk patients, PTA and stenting are preferred because of the low mortality and morbidity rates.

Keywords: high risk patients, peripheral arterial disease, percutaneous transluminal angioplasty, stenting

OP-124

Bone Marrow Aspirate Consentrate Transplantation for Critical Limb İschemia: Preliminary Results of Consecutive Nine Patients

Eyüpserhat Çalık, *Nail Kahraman, Ahmet Aydın, Adem Kıymaz, Ümit Arslan, Hüsnü Kamil Limandal, Ayşin Işık Savur, Özgür Dağ, Mehmet Ali Kaygın, Bilgehan Erkut*

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Background: Bone-marrow cell transplantation has been shown to induce angiogenesis and thus improve ischemic artery disease. We aim to review the effects of intramuscular with or without intraarterial bone marrow cell transplantation, using the Harvest SmartPrep™ Bone Marrow Aspirate Consantrate (BMAC) system, in patients with ischemic limbs due to peripheral arterial disease (PAD) with a high risk for amputation.
Methods-Results: After failed or impossible operative and interventional revascularisation and after unsuccessful maximum conservative therapy, 9 patients, average age 42.8 (ranging 27–61), with severe critical limb ischemia had autologous BMAC transplanted into the leg arteries and into the ischemic legs at the Erzurum Training and Research Hospital, at last 8 months. Patients were followed up prospectively for total relief of rest pain without the need for analgesics, change in peak walking time (PWT), improvements in ankle-brachial pressure index (ABI), transcutaneous oxygen saturation using pulseoximetry (SaO_2), angiographic evidence of new collateral vessel formation. In the patients, 240 ml BM were aspirated from posterior iliac crests, under local anesthesia with sedo-analgesia and separated with the Harvest SmartPrep® BM centrifuge. The resulting 40 ml BMAC was injected into the artery and deeply intramuscular at 40–50 sites into the ischemic leg and foot. Follow up investigations were done for 1, 3, 6 and 12 months after therapy. There were no serious procedure-related complications. The mean follow-up time was five months and limb salvage was achieved in all patients. There were no major amputation and continue to follow of patients.
Conclusions: Preliminary results of our study showed that; autologous bone marrow transplantation is a safe and very promising new therapy for patients with leg-threatening ischemia. On the strength of past experience bone marrow transplantation can help to prevent major amputation in critica lischemic limbs.

Keywords: bone marrow cell transplantation, angiogenesis, peripheral arterial disease, critical limb ischemia, amputation

Thoracic vascular disease 1

OP-125

Vasorelaxant Effects of Dobutamine and Levosimendan on Rat Aorta Rings

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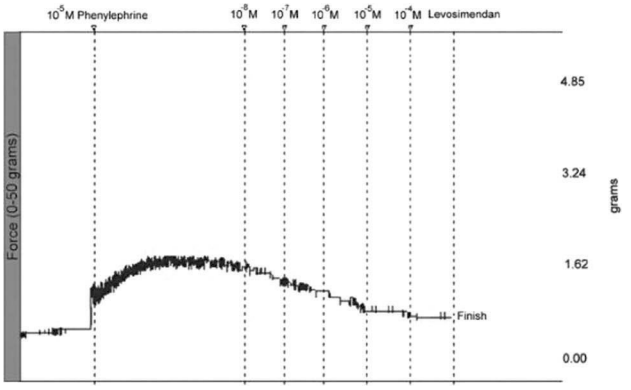
Objective: In this experimental study the vasorelaxant effects of levosimendan and dobutamine on isolated rat thoracic aorta preparates were compared.
Methods: Sixteen Wistar albino male rats were used. The thoracic aortas were removed carefully and were transferred to petri dishes containing Krebs solution. Aortic rings of approximately 5 mm in

Dose-response curve for Levosimendan in a rat ring



length were prepared and placed in organ bath. Contraction and relaxation forces of the aortic rings were recorded. Contraction response was obtained by applying 10–5 M phenylephrine to aortic rings. Following this, cumulative doses of levosimendan (10–8 M-10–4 M) was applied to 8 aortic rings (n = 8) and cumulative doses of dobutamine (10–8 M-10–4 M) was applied to the other 8 aortic rings (10–8 M-10–3M) and dose-response curves were recorded. EC50 and pD2 values were calculated by the computer program named Graph Pad Prisim 4.0. Mann-Whitney U-test was utilized to make statistical analysis.

Results: The relaxation response observed in aortic rings by application of levosimendan 10–4 M levosimendan was 92%, 33 while the relaxation response observed in same by application of 10-4 M dobutamine was 82%, 48. This did not show a significant difference between both relaxation responses (p = 0, 059). The EC50 value was calculated as 6, 605× 10-6 M for dobutamine and 5, 093 × 10–5 M for levosimendan. pD2 value was found as 5.18 ± 0.41 for levosimendan and 4.29 ± 0.17 for dobutamine.

Conclusion: Levosimendan and dobutamine molecules *in vitro* rat aortic rings have similar vasorelaxant effects.

Keywords: levosimendan, dobutamine, vasospasm, rat aorta, organ bath

OP-126

The Early and Midterm Results of Stent-Graft versus Medication Therapy for Chronic Type B Dissection

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Objective: This prospective multi-center comparative study examined early and midterm results of medication and stentgraft therapies on the chronic type B aorta dissection in China.

Methods: 303 consecutive patients collected from four centers in China from January 2007 to December 2010 with chronic type B aorta dissection were prospectively enrolled and treated by either optimal medication therapy (OMT) or thoracic endovascular aorta repair (TEVAR).

Results: There were 208 patients in the TEVAR group and 95 patients in the OMT group. Procedural success was 100%, and there was no death during index hospitalization in both groups. In the TEVAR group, two patients (0.9%) suffered from retrograde type A dissection, and two (0.9%) suffered from paraplegia or paraparesis. For in-hospital outcome, multivariate analysis showed that age greater than 75 years and ASA class greater than III were independent predictors of major early adverse events. In the OMT group, five patients died for rupture of enlarged false lumen, and six patients expired suddenly for unknown reasons. Fourteen cases required crossover to TEVAR (n = 12) or surgical conversion (n = 2). In the TEVAR group, nine patients required re-intervention or surgical conversion, and one died of postoperative multi-organ failure. One patient expired for delayed retrograde type A dissection, and four expired suddenly for unknown reasons. The Kaplan-Meier analysis of survival probability at two years and four years was 87.5% and 82.7% with TEVAR and 77.5% and 69.1% respectively with OMT. The estimated cumulative freedom from aorta-related death at two and four years were 91.6% and 88.1% with TEVAR and 82.8% and 73.8% with OMT (log-rank test P = 0.0392).

Conclusion: This was the first prospective multi-center comparative study on the treatment of type B aorta dissection in China. TEVAR turned out to have a significantly lower aorta-related mortality compared with OMT, and a seemingly lower overall mortality rate.

Keywords: aorta dissection, medication, stent

OP-127

Screening for Left Subclavian Artery Stenosis in Patients Undergoing Coronary Artery Bypass Graft Surgery

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Aim: Stenosis of the left subclavian artery may decrease the clinical benefit of the surgery and result in the coronary subclavian steal syndrome. This study sought to evaluate the frequency of the subclavian artery stenosis via color Doppler ultrasonography (CDU) and determine the risk factors for subclavian artery stenosis.

Methods: 320 consecutive patients who were referred for CABG were included in the study. All patients underwent subclavian artery color Doppler ultrasonographic evaluation while routine carotid artery examination was performed during the preoperative period. Patient characteristics including demographic, echocardiographic, operative, clinical and laboratory parameters were recorded.

Results: 23 of the 320 patients (7.18%) had stenosis of the left subclavian artery while 7 patients (2.18%) also had right

subclavian artery stenosis. Age, dyslipidemia, chronic renal failure, peripheral artery disease (PAD), proximal right coronary artery (RCA) stenosis and carotid artery stenosis were all significantly associated with subclavian stenosis. In multivariate regression modeling; age, PAD, proximal RCA stenosis and carotid artery stenosis independently predicted subclavian stenosis.
Conclusion: We recommend routine preoperative screening with CDU for those CABG patients at high risk for subclavian artery stenosis

Keywords: arterial grafts, coronary artery bypass grafts, peripheral vascular disease, color doppler ultrasound

OP-128

Iloprost and Vitamin C Attenuates Myocardial Injury as a Remote Organ Induced by Suprarenal Aortic Ischemia-reperfusion in Rabbits

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Objective: The aim of this study was to evaluate antioxidant and cytoprotective effects of iloprost and Vitamin C in a distant organ after abdominal aorta ischemia reperfusion injury.
Material-Methods: 28 New Zealand Rabbits weighing 2400–2800 g were used for this study. The Rabbits were divided into four equal groups. These groups are ischemia-reperfusion group (Group 1), sham group (Group 2), iloprost group (Group 3), and iloprost+vitamin C group (Group 4). Suprarenal aorta was occluded with a vascular clamp. Following 30 minutes of ischemia, the vascular clamp was removed. Study groups rabbits received 10 ng/kg/min iloprost and 10 mg/kg vitamin C by femoral vein between 30 minutes before clamping and after clamping 4 hours. At the end of the reperfusion period, the rabbits were sacrificed by a high intraperitoneal dose of Xylazine+ketamine injection. Myocardial tissue samples were taken for analysis. We evaluated SOD, MDA and catalase in myocardial tissue samples.
Results: Group 3 and Group 4 significantly reduced oxidative stress markers in tissue samples ($p < 0.05$) and significantly decreased myofibril injury and mitochondrial morphology changes in the myocardial tissue with electron microscopy ($p < 0.05$). Myocardial edema was significantly alleviated by iloprost and iloprost+vitamin C administration ($p < 0.05$).
Discussion: This study clearly showed that myocardial injury and edema happened after abdominal aorta ischemia reperfusion. The positive effect of Group 3 and 4 in the attenuation of distant organ reperfusion injury has been demonstrated.

Keywords: ischemia-reperfusion, abdominal aorta, remote, myocard, iloprost, electron microscopy

OP-129

Usefulness of the Antegrade Gore Tag Deployment Using "Through and Through Bowing Technique" with Total Arch Debranching and its Initial Outcome

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Aim: We develop the new technique "through and through bowing technique" which is antegrade deployment of Gore Tag with total arch debranching for the treatment of aortic arch aneurysm. The aim of this study is to prove the efficacy of this method and to analyze its initial outcome.
Methods: A stiff guide wire was passed through debranching prosthesis and put it through femoral artery. By pushing bilateral end of stiff wire against the aortic arch, Tag device was located along the greater curvature and bent like a bow. The initial 5 patients underwent hybrid therapy without using "through and through bowing technique" (control group). In contrast 8 patients underwent placement using "through and through bowing technique" (bowing group). The migration distance defined as pre and post deployment distance was measured from stored fluoroscopic image. The surplus distance defined as the distance between distal end of debranching proximal anastomosis and proximal endograft were measured by postoperative CT. Patients commodities, operative valuables, and postoperative complication were retrospectively examined.
Results: There was no significant difference about patients demographics. Although the operation time was significantly longer in control group than in bowing group, there was no difference of the amount of bleeding, contrast medium, and fluoroscopic time between two groups. The mean migration distance in control group (8.4 ± 6.5 mm) was significantly longer than that of bowing group (0.25 ± 0.46 mm). The mean surplus distance in control group (29.8 ± 9.8 mm) was significantly shorter that in bowing group (6.7 ± 1.8 mm). The post operative complications were minor in each group. There was no operative mortality in each group.
Conclusion: The present paper demonstrated precice positioning and usefulness of the antegrade Gore Tag deployment using "through and through bowing techniqueî with total arch debranching.

Keywords: aortic arch aneurysm, hybrid approach, through and through bowing technique, gore tag

OP-130

Long-Term Results After Thoracic Aortic Surgery: Acute Dissection vs. True Aneurysm Rupture

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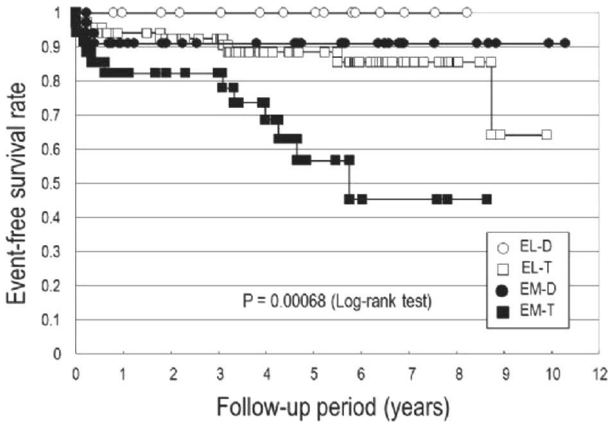
Aim: To investigate whether or not the long-term result after emergent aortic surgery is different between dissection (D) and true aneurysm (T), and whether or not its difference is associated with arteriosclerosis-related potential risks.

Methods: One hundred and fifty five patients aged 50 years or older underwent elective (EL) or emergent (EM) thoracic aortic surgery between 2001 and 2010 who were divided into 4 patient groups, EL-D (15 pts, 67 ± 10 years old), EL-T (68 pts, 70 ± 7 years old), EM-D (36 pts, 71 ± 11 years old), and EM-T (36 pts, 76 ± 7 years old). The hospital mortality, the event-free survival rate at 5 years, and SF-36 quality-of-life (QOL) score in physical function and mental health were analyzed.

Results: The hospital mortality was 0 (0%), 5 (7.4%), 4 (11.1%), and 8 (22.2%) in the EL-D, EL-T, EM-D, and EM-T groups, respectively. The rate free from hospital death and cardiovascular event-related death was 100.0%, 88.4%, 91.1%, and 56.7% at 5 years in the EL-D, EL-T, EM-D, and EM-T groups, respectively (P = 0.00068). Cardiovascular event-related deaths were seen in 5 EL-T patients (7.9%), 1 EM-D patient (3.1%), and 7 EM-T patients (25.0%), the cause of which was acute myocardial infarction in 1 patient (EM-D), aneurysm rupture in 10 patients (EL-T, 5; EM-T, 5), and heart failure in 2 patients (EM-T). The SF-36 score was 38.1 ± 17.3, 28.5 ± 20.3, 30.1 ± 20.4 and 12.9 ± 20.7 in the EL-D, EL-T, EM-D, and EM-T groups, respectively, in physical function (P = 0.00014), but exhibited no differences in mental health between the groups.

Conclusions: The cardiovascular event-free survival rate and QOL (physical function) level were significantly lower in the EM-T group than the other groups, which were caused by another aneurysm rupture or heart failure worsening in the late period, suggesting that a regular and long-term follow-up (computed tomography; echocardiography) is important after emergent surgery in patients with true aneurysm rupture.

Cardiovascular event-free survival



Keywords: emergent aortic surgery, postoperative long-term results, acute aortic dissection, true aortic aneurysm rupture, SF-36, physical function, mental health

OP-131

Smooth Muscle Cell Phenotype is Different Between Dissected and Unaffected Aortic Media

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Aim: Smooth muscle cell (SMC) is the most important cell of aortic wall.The phenotype change of SMC in the aortic media may play a critical role in the pathogenesis of aortic dissection (AD). Our study was designed to investigate SMC phenotypic difference between dissected and normal aortic media.

Methods: Using optimized culture technique, aortic medial SMCs were obtained from patients with AD and controls. *In vivo* and *in vitro* expression of smooth muscle-myosin heavy chain 2 (SM-MHC-2), B-smooth muscle actin (B-SMA), osteopontin (OPN) and non-muscle myosin heavy chain B (SMemb) were evaluated by immunostaining and immunoblotting.

Results: The majority of SMCs from the dissected media displayed an elongated, spindle- or triangle-like shape as control SMCs, there were also some oval or flat, quadrate cells in the dissection cultures. In contrast to controls, SMCs derived from the dissected media uniformly showed the negative staining for the contractile proteins and the intense staining for the synthetic markers. Similarly, *in vitro* protein levels of B-SMA and SM-MHC-2 were significantly decreased to 60% ($P < 0.01$) respectively, whereas those of OPN and SMemb were markedly elevated by 8.5- and 5.2-fold respectively ($P < 0.01$ for both).

In vivo expression of the phenotypic markers showed the parallel results. Furthermore, SMCs derived from the dissected media exhibited the enhanced proliferation ($P < 0.05$).

Conclusions: We have established a simple and potent method to acquire SMCs from the dissected and unaffected aortic wall. Compared to the contractile SMCs in the unaffected media, those in the dissected media manifest phenotypic switching from the contractile to the synthetic type. The primary cultures can be subsequently used as in vitro models and contribute to further elucidate the etiopathogenesis of AD.

Keywords: thoracic aortic dissection, smooth muscle cell, primary cell culture, phenotypic switching

OP-132

Endovascular Thoracic Aortic Repair: Single Center Experience with Short-Term Results

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Objectives: To present our experience and short-term results of endovascular aortic repair of thoracic aortic pathologies.

Methods: We performed endovascular stent-graft procedures in 50 patients (39 male) for thoracic aortic pathologies between January 2009 and June 2013. 19 patients underwent endovascular repair for thoracic aortic aneurysm, 24 patients for aortic dissection, 5 patients for traumatic transection, 1 patient for intramural hematoma, and 1 patient for bronchial artery aneurysm. When needed, subclavian artery was occluded via axillar or femoral artery with or without the carotid-subclavian bypass operation. In patients with type I dissection or aortic aneurysm including aortic arch, endovascular repair was performed after surgical operation. All patients were scanned with computed tomographic angiography pre- and postoperatively.

Results: Mean diameter was 66.0 mm (range 44–94 mm) and 32.2 mm (range 25–49 mm) in patients with fusiform (14 patients) and saccular (5 patients) aortic aneurysms, respectively. While 4 patients had a type I dissection, 20 patients had a type III dissection. Thirteen patients (1 ruptured thoracic aneurysm, 7 type III dissection, and 5 traumatic aortic transection) were treated with emergency endovascular repair. Placement of proximal thoracic aortic extension was needed in 2 cases (4%). Left subclavian artery was occluded in 10 patient, 3 of them had prior carotid-subclavian bypass. Postoperative 30-day mortality was 4% (2 patient). One paraplegia (2%) was observed after type III dissection treatment. Rate of early and late endoleaks, excluding dissection and intramural hematoma patients, were 12% and 2%, respectively.

Conclusion: Endovascular aortic repair is an encourage technique with low morbidity and mortality rates. However, high re-intervention rate is a problem to be solved.

Keywords: thoracic aorta, endovascular aortic repair, aortic stent-graft

OP-133

Comparison of Open Femoral Access versus Percutaneous Closure Devices for Endovascular Interventions

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Background: Safe and effective vascular access is mandatory for percutaneous endovascular interventions. Femoral access can be obtained with surgical or percutaneous approach. We aim to compare open surgical access and percutaneous closure devices performed at our institution retrospectively.

Material-Method: Endovascular procedures including aortic repair and transfemoral aortic valve implantation performed at our institution were analyzed in terms of femoral access technique and vascular complications. 130 patients were operated for endovascular aortic repair procedures via surgical femoral access.Transfemoral aortic valve implantation(TAVI) was performed for 100 patients, of 88 femoral access was obtained with percutaneous closure devices. Vascular complications were analyzed.

Results: Among 130 patients with surgical approach, 115 patients underwent computerized tomographic angiography (CTA) controls routinely for detecting endoleaks and 15 patients gave-up control visits.CTA images were analyzed retrospectively for patency of femoral arteries. 8 patients undergoing TEVAR procedures didnot have images of femoral region. 2 patients' femoral arteries could not be examined because of artifacts originating from bilateral femoral prosthesis and non-contrast tomographic evaluation. 174 femoral arteries and 2 iliac arteries of 105 patients were analyzed with CTA exhibiting 3 femoral arteries (1.70%) with non-significant stenosis (lower than 40%). 102 (97.14%)patients and 171 femoral arteries (98.3%) had normal femoral angiographic images. Among 100 patients undergoing TAVI, surgical approach was used in 12 patients and percutaneous closure-devices were used in 88 patients (Prostar XL in 63, ProGlide in 21 and both Prostar XL+ProGlide in 4. Among percutaneous approach group, a total of 22 (25%) vascular complications were seen.In 16, conversion to surgery was required, wheras other 6 patients were followed without surgical intervention (4 access site heamatoma, 1 glue injection under ultrasonographic guidance, 1 endovascular stent insertion).

Conclusion: Percutaneous closure devices have become more popular with advancing technical improvements with a tendency to exclude surgical back-up. We assume that open surgical access still serves as the best femoral access way and use of percutaneous devices should be standardized according to some patient and procedure depended criterias instead of nonselective use in all patients.

Keywords: endovascular interevntion, femoral access, percutaneous closure devices

OP-134

Mid-Term Results of Stanford Type B Aortic Dissections in Northeast China—A Single Centre Report

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Objectives: To investigate the mid-term outcome of Stanford type B aortic dissection patients who underwent thoracic endovascular aortic repair (TEVAR) or conservative therapy from a single centre in northeast China.

Method: From January 2000 to December 2011, 263 consecutive patients with type B dissection admitted in our hospital (201 men; mean age 53.6 years; range 28–80). Among those, 140 patients were treated conservatively, while 123 by TEVAR. 5 patients received open surgery were excluded from this study.

Results: In TEVAR group, technical success was achieved in all patients. Intentionally coverage of the left subclavian artery (LSA) was performed in 48 selective patients (34.3%) without revascularization. Both left common carotid artery and LSA were covered in 2 patients with an additional procedure of carotid–carotid bypass at the time of TEVAR. No paraplegia developed. In conservative group, 45 patients (36.6%) were defined as complicated dissection (rupture, malperfusion syndrome, or aorta dilation), who refused TEVAR because of financial problem. The overall 30-day and in-hospital mortality was 6.5% (4/140 in TEVAR group, and 13/123 in conservative group, $P < 0.05$). 5 patients needed re-intervention due to retrograde type A dissection in one, consistent type I endoleak in two, stent migration in one, and abdominal aortic aneurysm in one. Deaths in chronic phase during a mean 4 years' follow-up showed no significant difference in groups (3/140 in TEVAR group, and 6/123 in conservative group, $P > 0.05$).

Conclusions: TEVAR is safe and feasible for type B aortic dissection, especially in complicated dissection. The cost, as well as the medical insurance, influences the development of TEVAR in northeast China.

Keywords: aortic dissection, endovascular aortic repair, stent-graft

OP-135

Branch Occlusion Following Aneurysm Repair Using Multi-Branched Thoracoabdominal Stent Grafts

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Objective: To identify risk factors for branch occlusion following endovascular TAAA repair.

Methods: Between September 2005 and May 2013, 120 patients underwent aneurysm repair using multi-branched thoracoabdominal stent-grafts. Follow-up included CTA at 1, 6 and 12 months and yearly. The current retrospective review excluded: preoperative dialysis, intraoperative branch occlusion, urgent repair, fenestrated branches, and perioperative death. Three-dimensional analysis of postoperative CTA was used to measure diameter of the aorta, and the length, diameter, overlap, orientation, and angulation of renal arteries and renal branches. Demographic data came from a prospectively maintained database. Potential risk factors for renal branch occlusion were screened using Fisher's exact test, and those found to have a significant effect incorporated into a multi-variable model.

Results: 100 stent grafts had 95 celiac branches, 100 SMA branches, and 189 renal branches. There were 79 men and 21 women; 17 Crawford type II aneurysms, and 83 of other types. During mean follow up of 22 months, there were 3 celiac occlusions, no SMA occlusions and 16 renal occlusions, none in women or type II TAAA. Renal thrombosis was more common in patients with long renal arteries ($p = 0.01$), longer overlap between the renal branch and artery ($p = 0.04$), and up-going branches ($p = 0.023$). Fisherís exact showed lower rates of renal occlusion with female gender ($p = 0.02$), type II TAAA ($p = 0.02$), COPD ($p = 0.06$), statins ($p = 0.06$), and ACE inhibitors ($p = 0.04$). There were higher rates with prior MI ($p = 0.003$). Only MI and ACE inhibitor therapy were significant ($p < 0.05$) on multi-variable analysis.

Conclusion: Strict uniformity of stent graft construction facilitated the identification of various systemic factors that affect branch patency, probably by reducing hyperplasia at the branch artery junction. We expect that recent changes in branch construction will introduce sufficient heterogeneity for an assessment of mechanical factors such as branch flexibility.

Keywords: thoracoabdominal, aortic, aneurysm, branch patency, endovascular

Thoracic vascular disease 2

OP-136

Is Internal Thoracic Artery a Reliable Conduit for Dialysis Patients As Candidates for Coronary Bypass Surgery?

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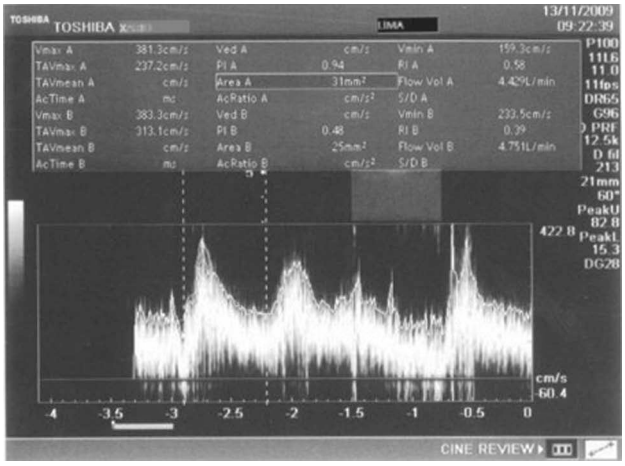
Background: It has been reported that if the AVF is located with ITA ipsilaterally, there may be coronary steal phenomenon due to dependency on dialysis. This condition may increase mortality and morbidity postoperatively. Doppler ultrasound is known as a reliable noninvasive technique to evaluate ITA pre and postoperatively. In this study, we have investigated whether it would be possible to predict the steal phenomenon on ITA due to upper extremity AVFs by using doppler ultrasonography preoperatively.
Methods-Results: 31 patients with end stage renal failure (ESRF) receiving routine out-patient hemodialysis at our hospital via functioning upper extremity arteriovenous fistulas (AVF), were identified. 27 patients were selected to be included in the study. 19 of the fistulas were located in the wrist and 8 were located in the antecubital region. The study was performed by means of using Toshiba, Xaria (Japan) coloured doppler ultrasonography machine. When the flow rates of AVFs evaluated on the time that AVFs were non-occluded, there were highly significant changes in systolic, diastolic and mean flow velocities of LIMA statistically. ($p < 0.001$) However, there were statistically significant changes in systolic, diastolic and mean flow velocities of LIMA when the AVFs were occluded. ($p < 0.05$).
Conclusions: We suggest that the patients and nephrologists ought to be informed on this matter and kept under close control. If any chest pain develops during dialysis the patient should be investigated ecocardiographically, and if necessary, angiographic intervention should be performed.

Keywords: coronary steal phenomenon, ITA, AVF, doppler ultrasound

LIMA Velocities of the patient with highest flow rate of AVF



LIMA Variables

	AVF Active	AVF Occluded
Systolic Flow Rate (cm/sec)	330,03 ± 1109,18	335,77 ± 150,16
Diastolic Flow Rate (cm/sec)	178,08 ± 95,79	190,18 ± 112,47
Mean Flow Rate (cm/sec)	251,58 ± 119,63	264,10 ± 144,88
Resistive Index	0,471 ± 0,106	0,461 ± 0,111
Pulsatility Index	0,654 ± 0,202	0,617 ± 0,193
Flow Volume (L/min)	1177,33 ± 928,24	1302,19 ± 1002,49

OP-137

Coarctation of the Aorta: Long-Term Follow-up Following Surgical Repair

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Aim: To find out the long-term morbidity and mortality following surgical repair of coarctation of the aorta in our patients.
Material and Methods: 110 patients underwent surgical repair for coarctation of the aorta between January 1999 and June 2011 in our hospital. 49 (44.5%) of the patients were contactable and came to the outpatient clinic for evaluation using echocardiography and computed tomography. The mean follow-up period was 64.0 ± 35.6 months.
Results: The mean age of the patients was 22.9 ± 11.3 years, ranging from 3 to 56 years. 28 (57.1%) were male and 21 (42.9%) were female. 22 (44.9%) had recoarctation, 19 (38.7%) had hypertension, 3 (6.1%) had aneurysm of the ascending aorta, 5 (10.2%) had aortic stenosis, 5 (10.2%) had aortic insufficiency, 2 (4.08%) had coronary artery disease, 1 (2.04%) had mitral insufficiency, 2 (4.08%) patients had undergone aortic valve replacement, 2 (4.08%) patients had undergone supracoronary graft replacement due to aortic aneurysm, 1 (2.04%) had undergone aortic valve replacement together with supracoronary graft replacement. None had a history of a cerebrovascular event.
Conclusion: Patients operated upon for coarctation of the aorta may develop cardiac diseases such as aortic aneurysm, aortic valve disease and ischemic heart disease which result in morbidity in the long term following surgery. Long-term survival of these

patients is reduced and some will require reoperation for the aforementioned cardiac diseases. Therefore, early recognition and intervention of such cardiac pathologies is crucial and the patients should be counselled regarding the risk of these developing and the importance of long term follow up.

Keywords: coarctation of the aorta, aortic valve disease

OP-138

The Effects of CYP1B1 and GSTP1 Isozymes in the Occurence Aortic Aneurysms

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Aim: Aortic aneurysms are vascular diseases that are associated with high mortality and morbidity. We searched the effects of Cytochrome P450 (CYP1B1) and Glutathione S-Transferase (GSTP1) isozymes in physiopathology of this important disease.

Materials Methods: Study group consisted of the patients with the diagnosis of aortic aneurysm (group I, n:14), control group consisted of the patients that were operated for coronary bypass surgery: preoperatively drug users (group II, n:21) and non-users (group III, n:15).

4-µ-thick paraffin sections of aortic biopsy materials were stained with hematoxylin and eosine, CYP1A1 and GSTP1 immunohistochemical markers. The specimens were evaluated using light microscopy at 40- to 400-fold magnification in a masked fashion.

Results: The expressions of CYP1A1 and GSTP1 isozymes were found statistically significantly higher in the patients with the diagnosis of aortic aneurysm than the control groups, both of drug users and non-users ($p > 0.05$).

Conclusion: In the patients of aortic aneurysm, with this study in which CYP1A1 and GSTP1 isozymes are first studied, important roles of CYP1A1 and GSTP1 isozymes are shown to prevent Oxidative stress and to end the Oxidative damage in the aortic aneurysm.

Keywords: aortic aneurysm, CYP1A1, GSTP1, immunohistochemistry

OP-139

Determining Factors That Influence Stent Graft Size Selection in Extensive Residual Type A Dissecting Aortic Aneurysm After Hybrid Arch Repair

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Objectives: In this study, we evaluate the sequential morphological remodeling of true and false lumens and discuss the factors that influence stent graft size selection in extensive residual type A dissecting aortic aneurysm. We looked into two important aspects, aortic cross section area and thrombosis ability with distal Stent graft-induced new entry (SINE) after hybrid arch repair taking into consideration.

Methods and Results: Between January 2006 and December 2010, 24 patients with residual type A aortic dissection aneurysm involving transverse arch were treated by hybrid type III arch repair. CT images were used to evaluate the morphological remodeling of the true and false lumen and occurrence of SINE was recorded.

17 out of all the patients with successful one-stage hybrid arch repair and stent grafting received follow-up for two years, and the incident of SINE had occurred in 10 patents. Cross-section area was the only parameter that showed significant difference in distal end of pre-stenting graft oversizing (Non-SINE 2.09 vs. SINE 4.76, $p = 0.025$).

Aortic false lumen remodeling in the first year showed shrinkage tendency for both SINE and non-SINE groups at the Subclavian artery level (Figure 5a). However, at the level of pulmonary artery, such a significant difference was only discovered in the SINE group ($p = 0.007$).

Conclusion: With larger stent grafts, thrombosis ability tend to be enhanced but occurrence of SINE may also increase. Naturally, we would make the size selection base on balancing of these two important factors. It came to our attention that minimizing SINE outweighs faster thrombosis speed because slower thrombosis speed seems not to pose any noticeable threats to the patients. Therefore, proper pre-stent grafting oversizing is crucial and we consider pre-stent graft oversizing of $2.09 + 1.03$ more appropriate.

Keywords: aortic dissection, elephant trunk, endoleak, hybrid surgery, stent-graft

OP-140

Endovascular Graft Repair of Thoracic Aortic Pathologies; Single Center Experience

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Endovascular stent greft treatment was initially used for the management of abdominal aortic aneurysm. Later it was used for the treatment of patients with thoracic aortic aneurysms. Initially the concept was to treat patients who were unfit for open surgery. Today thoracic endovascular aortic repair (TEVAR) is increasingly being used for many aortic pathologies including extensive arch and thoracoabdominal pathologies.

Between 2007–2013, 55 patients (45 male and 10 female) with thoracic aortic pathology were treated with TEVAR. Demographic data, comorbidities and outcomes were collected from patient records. Primary outcomes were mortality and aneurysm related mortality. Secondary outcomes were endoleak status, major adverse effect and reintervention.

There were 28 patients with degenerative thoracic aneurysms, 19 type B dissections (9 acute and 10 chronic), 4 type A dissection, 2 penetrating aortic ulcer (PAU) and 2 traumatic aortic transections. TEVAR was performed in emergency situation in 29.1% (n = 16) of cases. Median age was 63 (27 to 82). Overall hospital mortality was 12.7% (n = 7) and among them 5 patients were emergency treated cases. Reintervention rate was 5.5% (n = 3). Hybrid abdominal debranching was performed in 5 patients and mortality was observed in 2 patients. Hybrid cerebral debranching and carotid-subclavian bypass was performed in 8 patients and mortality was observed in 1 patient. Mean follow up was 24.02 ± 13.26 months (8 to 48). Follow up was complete in 87.3%. Late mortality was observed in 10 (18.2%) patients. Aneurysm related mortality was 5.5% (n = 3).

Conclusion: TEVAR represents a promising early and mid term results in different aortic pathologies. Patients with acute type B dissection and acute aortic transection have the favorable results. Reintervention rate is high in chronic dissection. Abdominal debranching operation has a higher mortality than anticipated.

Keywords: TEVAR, thoracic aortic aneurysm, aortic transection

OP-141

Patency of Supra-Aortic Bypass Grafts in Hybrid Surgery. Are They Durable?

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Purpose: To present analysis of results of supra-aortic bypass procedures from 2005 to date. Grafts from ascending aorta or cross neck bypass were performed to facilitate landing in Zones 1 and 0.
Methods: 30 hybrid procedures done at Waikato hospital from March 2005 required bypass procedures for aortic arch pathology. PTFE and Dacron grafts were used for the bypass. Median sternotomy was used to access the ascending aorta and a limited Rt anterior thoracotomy in one patient. Bypass across the neck was pre-tracheal in all cases. Most procedures were done in one stage. Surveillance was by clinical examination, Duplex scan or CT.
Results: 30 patients (20 Male) underwent hybrid repair. The median age was 62 years (range: 19–79 years). A total of 61 grafts were performed with 40 (65.5%) having Dacron grafts. There were 19 (31%) grafts from the ascending aorta, and 30 cross neck. Complicated Type B dissections and Thoracic aneurysms formed the majority of patients 20 (66%). Most hybrid procedures were done in one stage (88%, n = 22). Dacron was used in 34 (73.9) occasions and PTFE in 12 (26.1%). 12% (n = 3) had a neck haematoma requiring exploration. 2 (8%) patients had wound infection requiring revision, one with superficial femoral vein and re-routing in another. There was no stroke or paraplegia. No bypass graft occluded either during or after the perioperative period. No other graft revisions or interventions were required.
Conclusions: Supra-aortic debranching is durable and is safe. Pre-tracheal positioning of graft is safe. Both Dacron and PTFE offer effective alternatives for de-branching.

Keywords: hybrid repair, supra aortic grafts, arch repair

OP-142

Aortic Angulation Remodeling of Distal Arch Dissection After TEVAR with Zenith "Pro-Form" TX2 Thoracic Endograft

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Background: Structural changes and incomplete endograft apposition to the aortic arch (bird-beak configuration) after thoracic endovascular aortic repair are poorly understood. The aim of this

study was to analyze the morphological changes, conformability, and angulation factors in patients who underwent stainless steel-based stent-graft repair of thoracic aortic dissection.

Methods: From March 2011 to March 2012, 10 patients with chronic type B aortic dissection requiring proximal fixation in zones 2 who underwent stent-graft repair using Zenith Pro-Form TX2 stent-grafts were enrolled. For comparison, another 10 patients who received Zenith Z-Trak stent-grafts were selected from September 2009 to February 2011. Chest computed tomography scans were analyzed at baseline, and then 1 month, 6, and 12 months postoperatively. Arch angulation and bird-beak configuration were evaluated according to sealing zones of attachment.

Results: Significant arch angle transformation was noted at innominate artery (168 ± 5° vs. 159 ± 6°, p = 0.010) and the zone 2 level (146 ± 17° vs. 157 ± 7°, p = 0.043) in Z-Trak treated groups but not in the Pro-Form during one year of follow-up. The bird-beak configuration was detected in 3 patients in the Pro-Form and 6 in the Z-Trak group at one month, and 3 in the Pro-Form and 8 in the Z-Trak group at 12 months. The mean bird-beak angle was significantly less in Pro-Form treated patients (at one month, 6 ± 10° vs. 16 ± 15°; p = 0.102, but at one year, 5 ± 8° vs. 20 ± 14°; p = 0.013). In the Pro-Form platform, preoperative zone 2 angle was predictive to the presence of a postoperative bird-beak configuration.

Conclusion: Aortic remodeling after stainless steel stent-graft repair of thoracic aortic dissection is a continuous process. Preoperative distal arch angle of zone 2 pathology is predictive to postoperative bird-beak configuration. Although Pro-Form endograft can provide better conformability on proximal fixation in distal aortic arch, special caution should be exercised when small distal arch angle presents.

Keywords: aortic remodeling, bird-beak, aortic dissection, TEVAR, pro-form

OP-143

Emergency Surgical Strategy in Acute Type A Dissection with Symptomatic Malperfusion in Endovascular Stent-Grafting Era

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Aim: The aim of the present study was to evaluate the outcome of emergent open surgery combine with thoracic aorta stent-grafting to expand the collapse true lumen for acute type A aortic dissection (AAD) complicated with symptomatic malperfusion.

Methods: Retrospective, observational study with follow-up of 18 ± 3.8 months. From Jan 2010 to Aug 2013, 84 AAD-patients underwent emergent surgery. Among of these 17 patients experienced symptomatic malperfusion. Surgery strategy is carried out by open hybrid approach to replace ascending aorta, or total arch followed by thoracic endovascular aortic repair (TEVAR) to expand the collapse true lumen.

Results: Among 17 patients, 12 of them (70.6%) had one iliac artery malperfusion and lead to weakness of one limb. Five of them had both iliac arteries occlusion. Four of them had renal arteries occluded; two of them had celiac trunk and superior mesentery artery occlusion. The cardiopulmonary bypass was carried on by perfusion through sewing vascular graft to perfusion both femoral arteries and right subclavian artery. One patient died 4 days after surgery because of brain swelling after large territory cerebellum infarction. Thirty-day mortality was 5.9% in malperfusion patients. After stent graft deployed the perfusion cannula were shift to ascending aorta graft to assure antegrade flow through the stent graft. All patients got immediate femoral perfusion after stent deployment. None of these patients need further bypass to distal limbs. Remodeling of the true-lumen was achieved by TEVAR in all. One patient required additional aortic stents after the emergency surgery.

Conclusion: Remodeling of true lumen can be achieved. The surgical strategy for this high risk group of patients can prevent malperfusion during and after surgery. The surgical mortality is acceptable. The short and mid-term efficacy is persuasive.

Keywords: acute type A dissection, symptomatic malperfusion

OP-144

Stent Graft Treatment for Blunt Traumatic Injury of the Thoracic Aorta: Clinical Evaluation Based on Trauma Injury Severity Score

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Objective: Blunt traumatic aortic injury is a life-threatening surgical emergency usually related to a violent crash. Treatment remains controversial in surviving patients who reach the hospital. Despite significant improvements in medical management, the results of early surgical repair are disappointing.

The purpose of this retrospective study was to compare the results of conventional repair and endovascular treatment of traumatic aortic injury, to better define the role of stent grafts in management of traumatic aortic injury associated with other life-threatening injuries.

Methods: Data from 20 patients (mean age 59 years; range 16 to 81 years; 13 male, 7 female) with blunt aortic injury treated in our institute between 1997 and 2013 were reviewed retrospectively. TEVAR was performed in 12 patients (Group SG), Open surgical repair was performed in 6 patients (Group OSR), and two patients

were treated conservative. TRISS score was used to evaluate severity of patient's injury.

Results: Injury severity score (ISS) and probability of survival (Ps) were no significant difference between each group. The survival case of OSR group had the tendency for ISS and PS to be low. Operative mortality was 9% in SG group and 33.3% in OSR group. Causes of death were massive bleeding and severe brain damage in OSR group and MOF due to acute stent graft obstruction in SG group. Intraoperative amount of blood loss and transfusion were fewer and operation time was shorter in SG group. The duration of ICU stay and hospital stay were no significant difference between each group, because of another operation and intensive care were performed after initial treatment.

Conclusion: Endovascular therapy is a safe and feasible procedure for blunt traumatic aortic injury. TEVAR may be preferable over conventional open repair in patients with multi-trauma and traumatic injury of the thoracic aorta.

Keywords: blunt traumatic aortic injury, endovascular therapy, trauma injury severity score, TRISS score

OP-145

Hybrid Repair of Complex Thoracic Aortic Arch Pathology

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Aim: Combination of endovascular procedures with surgical modifications enable complete coverage of the aortic arch without risking cerebral perfusion and have emerged as an effective treatment for these pathology. Hybrid arch techniques have been developed to address various arch disorders, including aneurysmal disease and aortic dissections. Here, we report our institutional experience with the hybrid aortic arch therapy approach.

Material and Methods: Between March 2009 and December 2012, 6 patients underwent hybrid arch repair. Ages ranged between 43 and 70 years. Four were males and 2 were females. Diagnoses were acute Type A dissection in 4 cases, and chronic Type B dissection in 2 cases. Comorbidity factors were identified as chronic renal Insufficiency, chronic obstructive pulmonary disease, morbid obesity, coronary artery disease and prior coronary artery bypass grafting.

Results: Extra thoracic right subclavian artery to left subclavian artery bypass was performed in 2 patients prior coronary artery bypass grafting in one and prior coronary artery bypass grafting as well as chronic renal insufficiency with a functioning arteriovenous fistula on the left arm in the other followed by thoracic endovascular stent grafting. Patients with acute Type A dissections received aortic debranching and ligation of the left subclavian artery (n = 3) followed by thoracic endovascular stent grafting. Mean duration of intensive care unit and hospital stays were 34.51 ± 12.32 hours and 4.6 ± 2.1 days, respectively. All the patients were followed mean 2.3 ± 0.7 years, symptom free.

Conclusion: Traditional surgical treatment of thoracic aortic aneurysms and dissections carries considerable mortality and morbidity rates despite surgical and anesthesiologic advances especially in patients with comorbidity factors. Hybrid therapy offers a releatively low risk treatment option for this particular patient population.

Keywords: debranching, TEVAR, hybrid

OP-146

New Technique for the Passage of the Endograft Through the Difficult Arch Anatomy

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Background: To review the utility of new endovascular technique, "lasso" technique, to allow the passage of the endograft through the aortic arch with acute angulation or after the graft replacement.

Methods: Among seven patients (74–89 year-old, male 5, rupture 1, right aortic arch 1) in whom the difficulty of endograft passage was encountered in the aortic arch, three patients showed acute arch angulation which trapped the tip of the endograft at the orifice of the left subclavian artery or the aneurysm. In other four patients, endograft did not pass the gap at the anastomosis of the artificial graft (Figures A and B) or the fold of previously placed endograft.

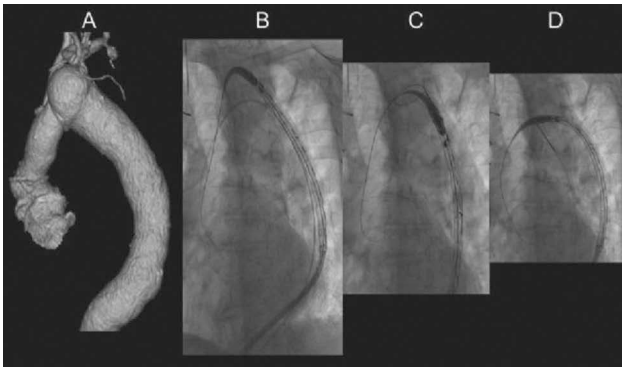
In all cases Lunderquist wire had been inserted from the access site (femoral artery 4, iliac artery 3) to ascending aorta for the insertion of endograft. To snare the tip of the endograft (Gore TAG 4, Medtronic Valiant 2, Cook Zenith TX2 1), the 25 mm goose neck snare was inserted from the same access site (2 patients) or the femoral artery on the other. In ascending aorta, the tip of Lunderquist wire was caught inside the snare (Figure C). The tip of the endograft laid along the major curvature was retracted downward to change its direction and the endograft was pushed forward inside the aortic arch (Figure D).

Results: The endograft proceeded into the aortic arch and was deployed at the site as planned successfully in all patients. No complication related to "lasso" technique was encountered. In one patient, additional endografting was necessary to treat type Ia endoleak 3 weeks later.

Conclusions: "Lasso" technique is useful and safe to allow the passage of the endograft through the difficult arch angulation and can be completed via the access from the iliac or femoral artery.

Keywords: TEVAR, arch anatomy, thoracic aortic aneurysm

Lasso technique



Vascular access 1

OP-147

Basilic Vein Transposed Fistula: Initial Experiences of a New Center

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Aim: Longterm hemodialysis access requires multıple surgical interventions. Basilic vein transposition (BVT) is comfortable and simplest autologous vein harvesting technic and recommended for hemodialysis patients. The aim of this study to investigate 28 patients on a new cardiovascular surgery center.

Material-Methods: A retrospective review was performed between May 2012 and May 2013. 18 patients were females (64%) and 10 (36%) patients were males. Mean age was 52 years. Transposed basilic vein was the first hemodialysis access fistula for 6 patients (21%). Using local anesthesia, basilic vein harvested with maximum 3 seperated incision and transposed a subcutaneous tunnel on the medial side of incision scar. After transposition, end to side anastomosis performed to brachial artery. A drain inserted along seperated incision.

Results: There were no wound infection, hematoma and steal syndrome. Average time for maturation was 38 days (29–52 days). All patients access hemodialysis with transient hemodialysis catheter untill fistula maturation.

Conclusions: BVT is a reliable method, although, it isn't practicing widely. It delays the using of other autogenous and nonautogenous grafts, so reduce complication rate and extend patient lifetime.

Keywords: Basilic vein transposition, AV fistula

OP-148

Comparison of Maturation Rates of Wrist Radiocephalic Arteriovenous Fistulas in Diabetic and Non Diabetic Patients

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Objectives: The radiocephalic arteriovenous fistula (RC-AVF) at the wrist is the first choice for hemodialysis access. Several authors have reported Diabetes mellitus (DM) as an independent risk factor for maturation and primary patency of RC-AVF. There are also reports stating DM as a clinicaly comorbid factor. We aimed to investigate the effect of DM on maturation and primary patency rates of RC-AVF.

Methods: Patients who underwent vascular access operations by our vascular acces department between May 2011–January 2013 were reviewed. Patients were grouped as diabetic and non diabetic. Data about age, gender, presence of hypertension, smoking, history of dialysis catheter intervention were recorded. Cephalic vein diameter, radial artery diameter and flow were noted. Postoperative complications and the maturation and primary patency of the fistula were also questioned.

Results: We reviewed 87 patients (43 in diabetic group and 44 in non-diabetic group) who underwent RC-AVF operation at the wrist. There was no significant difference between the demographic parameters of the two groups. The cephalic vein diameters were similar. The radial artery diameters (2.34 ± 0.26 mm versus 2.63 ± 0.38 mm, p = 0.0002) and the radial artery flows (25.05 ± 11.8 ml/min versus 28.9 ± 11.3 ml/min, p = 0.0277) of the diabetic group were significantly lower then the non diabetic group. There was no significant difference between the non-maturation (%32.6 versus %22.7, p = 0.3105) and primary patency rates (67.4% versus 65.9%, p = 0.8843) of the groups.

Conclusions: Even though there is no statistically significant difference between the non-maturation rates of the groups, we believe that the non-maturation rate is clinically lower in the diabetic group. The significant lower radial artery diameter and flow measurements may be the responsible factor. RC-AVF at the wrist remains our first choice for vascular access in diabetic patients as in non-diabetic patients depending on the satisfactory results.

Keywords: wrist arteriovenous fistula, diabetes mellitus

OP-149

Autogenous Saphenous Vein versus PTFE Graft Interposition in Arteriovenous Fistula Formation

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Objective: Bridge graft interposition is the other choice when the superficial venous system is inadequate to perform a simple radio-cephalic and brachio-cephalic fistula. We report the postoperative outcomes of 54 patients who underwent brachial/radial artery-basilic/high brachial vein autologous saphenous vein or PTFE graft interposition as a vascular access for hemodialysis.

Methods: The whole of the study group was evaluated via color Doppler ultrasonography during preoperative course and superficial venous systems of these patients were found inadequate to perform simple radial/brachial artery-cephalic vein anastomosis. 29 patients underwent saphenous vein interposition while PTFE graft was chosen in 25 patients. Postoperative outcomes were compared following the surgery.

Results: Patients were followed up for 36 months. In saphenous vein interposition (SVI) group fistula failure was observed in 5 of 29 patients (17.2%). In PTFE group, arteriovenous fistula failure was observed in 13 of the 25 patients (52%). Primary patency rate was 93% in 12th month and 82% in 24th month in SVI group while it was 88% in 12th month and 56% in 24th month in PTFE group. Secondary patency rate was 96% in 12th month and 93% in 24th month for SVI group while 96% in 12th month and 84% in 24th month for PTFE group.

Conclusion: Autologous saphenous vein can be preferably chosen as a bridge graft due its higher primary and secondary patency, lower complication rate and cost when compared with PTFE grafts.

Keywords: arteriovenous fistula, PTFE, saphenous vein, graft patency, hemodialysis

OP-150

Pattern of Initial Permanent Vascular Access in New Hemodialysis Patients in a Tertiary Care Hospital in Southern Thailand

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Objective: To determine pattern of vascular access operation in renal failure patients in a tertiary care hospital in southern Thailand.

Methods: All new hemodialysis patients receiving arteriovenous fistula (AVF) or arteriovenous graft (AVG) operations in Songklanagarind hospital from 2008 to 2011 were studied. Types and outcomes of the created access were analyzed.

Results: 470 patients who received their first permanent vascular access operations were enrolled in this study, from the total of 846 operations in the study period. Prior central venous catheter (CVC) placement was presented at first visit in 205 (43.6%) patients and increased to 231 (49.1%) on the operation day, average 74 days of waiting time. Only 39% of patients referred from Songklanagarind hospital's nephrology service had prior CVC placement compared to 61% in patients referred from other hospitals, $p < 0.01$. AVF was performed in 337 patients (71.7%), of which the three most common sites were: wrist radiocephalic, snuffbox and brachiocephalic. AVG was performed in 133 patients (28.3%), of which 96% were forearm AVG. Primary failure rate were 27.4% and 7.3% in AVF and AVG groups, respectively ($p < 0.01$). In the AVF group, immaturation was significantly higher in the snuffbox fistulas. During follow up, average 706 days, access-related complications occurred in 40.6% and 62.2% in AVF and AVG groups, respectively ($p < 0.01$). The most common complications were stenosis in AVF group (67%) and thrombosis in the AVG group (51%). Infections were found in 0.9% and 6.3% in the AVF and AVG groups, respectively ($p < 0.01$).

Conclusion: AVF is the first initiated vascular access for suitable patient in Songklanagarind hospital compatible with the 2006 KDOQI guideline. However, the initial used of CVC in this study was too high. Even though with higher immaturation rate, AVF provides lower and minor complications during follow up compared to AVG.

Keywords: vascular access, hemodialysis, arteriovenous fistula, arteriovenous grafts, central venous catheter

OP-151

Left Innominate Vein Compression Syndrome-High Clinical Significance in Hemodialysis Patients

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Aim: To evaluate the dialysis history, clinical symptoms, imaging findings and outcome of the management of left innominate vein (LIV) compression syndrome in hemodialysis patients.

Material-Methods: From July 2006 to July 2013, 19 haemodialysis cases of LIV stenosis or occlusion were treated and 16 cases were confirmed as LIV compression syndrome by CT scan. The clinical data was evaluated retrospectively.

Results: There were 9 males and 7 females (mean age: 61.63 ± 13.12 years). All of them had permanent vascular access without catheterization history. The mean access time was 41.94 ± 42.59 months (3–156 months). All cases were symptomatic with arm swelling (n = 16), ipsilateral face and chest swelling (n = 11), visible collateral veins (n = 14), arm pigmentation (n = 1), ulceration (n = 1). The mean course of symptom was 4.28 ± 5.40 months (1 week–18 months). Venography showed three types of LIV compression accompanied with jugular vein reflux and collaterals. Type I: LIV compression section was flattened, superior-inferior diameter widened, partial opacification fades (n = 3), Type II: short segment of LIV stenosis or obstruction, (Type IIa, stenosis (n = 7), Type IIb, obstruction (n = 2)), Type III: long segment of left innominate vein obstruction (n = 4). CT showed LIV was compressed by the aortic arch (n = 10) and left brachiocephalic artery (n = 6), one case of an aortic dissection aneurysm and aortic calcification (n = 5). Despite conservative therapy in 3 cases, ligation in 5 cases, endovascular therapy was done in 8 cases, technique failure in one case. In first 2 cases, PTA was done and primary patency was 4 and 5 months respectively. In next 5 cases, stent placement was done. On follow-up (mean: 17.4 months, 1–39 months), one case died of stoke 13 months later, and 3 cases undertaken reintervention, symptoms were all resolved.

Conclusions: The left innominate vein compression syndrome was the main cause of the LIV stenosis and had clinical significance in hemodialysis patients. According to the venography, it could be divided into three types. MDCT was the first choice for diagnosis and stent placement was the first choice for management.

Keywords: hemodialysis, left innominate vein compression, endovascular therapy, MDCT, venography

OP-152

Single Institute Experience of Arteriovenous Fistula Formation for Hemodialysis

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Aim: Patients with chronic renal failure who require hemodialysis need a vascular access way with arteriovenous fistula formation being the first choice. We present our experience fistula operations at our department.

Material-Methods: Between 2007–2013, 168 arteriovenous fistula operations have been performed at our institute. These operations include primary snuff-box, radiocephalic, brachial arteriovenous fistula formations, AVF formation with graft insertion, fistula revisions including thrombectomy, and closure of an existing AVF. Doppler ultrasonographic evaluation is performed initially. Our first choice for constructing primary AVF is snuff-box level. Patients with a weak venous vessel structure, repeating fistula operations or requiring fistula revisions, upper extremity venography is obtained to assess venous outflow tract and to decide the level and type of a new AVF formation. Patients having thrombosis or obstruction in subclavian vein are recommended for permanent central catheter insertion.

Results: 60 (35.7%) women and 108 (64.2%) men underwent arteriovenous fistula formation for haemodialysis. 123 patients (73.2%) underwent primary AVF formation, 28 (16.6%) underwent AVF with graft insertion, 17 (10.1%) were revisions for previously constructed AV fistulas. AVF closure operation was done for aneursym formation in 4 patients and for massive haemotaoma after dialysis in 1 patient. All the patients who had primary AVF formation were recommended to wait for 2–4 weeks for fistula development. Patient who had AVF with grafts could have dialysis via fistula graft after the operation.

Conclusion: AVF formation is the first choice of vascular access for patients with chronic renal failure necessiating chronic haemodialysis. AVF prevents central catheter insertion and related potential complications. Initially we prefer to construct AVF at distal levels, preferably snuff box level if the diameters of the vessels are appropriate, and protect more proximal levels for reoperations if required.

Keywords: arteriovenous fistula, vascular access, hemodialysis

OP-153

Comparison of One-Stage or Two-Stage Basilic Vein Transposition

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Objective: This study aims to compare the results of one-stage or two-stage basilic vein transposition (BVT) in hemodialysis patients. Study design: Non-randomized, retrospective study.

Material: Between January 2007 and January 2012, 96 patients who were diagnosed as end-stage renal failure (ESRF) (54 males, 42 females; mean age 43.6 ± 14 years) underwent one-stage or two-stage BVT in our clinic.

Patients: All patients who had lost the chance for a native radio-cephalic or brachiocephalic arterio-venous fistula (AVF) were scheduled for one-stage or two-stage BVT after arterial (brachial, radial and ulnar) and venous (basilic and cephalic) doppler ultrasonography. Patients were retrospectively divided into two groups including; Group 1: basilic vein diameter of >3 mm and who underwent one-stage BVT and Group 2: basilic vein diameter of <3 mm and who underwent two-stage BVT. In Group 1, basilic vein with a single incision was anastomosed to the brachial artery, followed by superficialization. In Group 2, the basilic vein was anastomosed to the brachial artery and underwent superficialization

procedure at one month. Fistula maturation and postoperative complications were assessed.

Results: The mean diameter of the basilic vein was statistically significantly higher in Group 1 (3.46 ± 0.2 mm), compared to Group 2 (2.79 ± 0.1 mm) ($p < 0.05$). In terms of postoperative complications; thrombosis, hemorrhage and hematoma were significantly higher in Group 1 (34%, 36% and 17%, respectively), compared to Group 2 (23%, 14% and 6%, respectively) ($p < 0.05$).

Conclusion: Two-stage BVT is superior to one-stage BVT due to its lower rate of postoperative complications and higher fistula maturation, despite its disadvantage of late fistula use.

Keywords: renal dialysis, arteriovenous fistula, basilic vein transposition, complication

Vascular access 2

OP-154

The Best Localization for a Long-Term Port Catheter: Comparison of Jugular and Subclavian Access in Oncology Patients

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Objectives: Implantable central venous port-catheters represent a revolution for oncology patients. As they facilitate the treatment of patients, they also improve the quality of life. The two most common veins used during port insertion are subclavian (SV) and internal jugular vein (IJV). In this article, we aimed to retrospectively analyze the clinical features of 404 venous port catheters implanted between January 2008 and June 2012.

Materials-Methods: The age of the patients ranged from 14 to 83 years. Forty percent of the patients (n: 163) were female, 60% were male (n: 241). Four hundred and four patients remained attached to the port for the periods ranged from 78 to 1980 days (median 507 days). Among 404 patients, 46 cases had a variety of early and late complications. Twelve of these complications observed after 1 day of catheter placement were defined as early complications, 34 of them were late complications. The most frequently observed early complication was catheter malposition detected in 5 patients. Out of 34 patients who had late complications, 15 were female, 19 were male; median age of these patients was 54.4 ± 2.2.

Discussion: In some studies, early complication rates are 0–5% for subclavian vein, 10–15% for jugular vein. As well as early complications, late complications are also important for patients due to the long-term use of port catheters. One of the most important late complications is catheter-related infections.

According to our results, itís observed that right jugular vein for permanent port catheters seems to have the longest uncomplicated using life when compared to LSV ($p < 0.05$).

Conclusions: Based on these data, we would like to take attention to a still arguable subject about implantation site of the permanent tunneled port catheters. Right jugular vein can be the first choice due to its long-lasting ability and lower risk of complications.

Keywords: central venous access, jugular, subclavian

OP-155

Our Experience of Primary Patency of PTFE Patch Closure at the Venous Anastomotic Site for AV Graft Thrombosis

Chandrashekhar A. R, *Sanjay C Desai, Rajendra Prasad*

Aim: According to the NKF-K/DOQI guidelines recommendation, the repermeabilisation of thrombosed arteriovenous (AV) grafts for haemodialysis must achieve positive results in 40% at 3 months, if it is performed by endovascular technique, or 50% at 6 months and 40% at one year if it is performed by surgical procedure. This study assesses the results of PTFE patch closure near the venous anastomotic site of AV graft thrombosis associated with venous anastomotic stenosis.

Materials-Methods: Between 2012 and 2013, 10 patients (average age: 58.2, 70% male) underwent thrombectomy and PTFE patch closure at the venous anastomotic site due to AV graft thrombosis (90% upper extremity, 10% lower extremity).

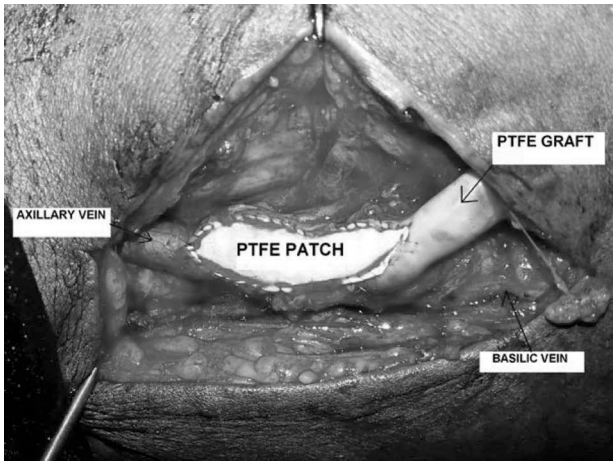
Under LA, incision was made at the earlier venous anastomotic site. Venotomy was made at the toes of the earlier venous anastomotic site after taking control of vein and graft. Proximal and distal thrombectomy was done. Central venous patency was checked through intra-operative angiography. Venotomy was closed with PTFE patch to increase the patency of the anastomotic site.

Results: In 3 patients, patency could not be restored due to complete occlusion; proximal narrowing and venous adhesions making it difficult to get venous control. Of the remaining 7 patients who underwent the procedure, primary patency at 3 and 6 months was 100% (mean follow-up time: 8 months) with an average stay of 3 days without post-operative complications.

Conclusion: There is no single standard approach for AV graft thrombosis and surgical management must be individualized for each case. The commonest cause of graft occlusion is at the venous anastomotic site. Hence AV graft thrombectomy with PTFE patch closure at the venous anastomotic site achieves better results compared to thrombectomy with primary closure or stent placements.

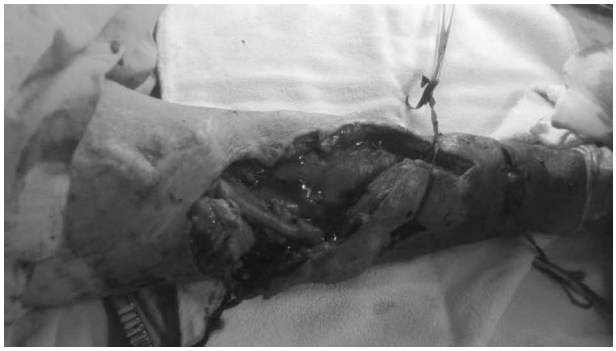
Keywords: PTFE patch closure, AV graft thrombosis, venous anastomotic site, thrombectomy

Ptfe patch anastomosis



After taking control of axillary vein, PTFE graft and basilic vein, venotomy was done at the foot end of the anastomosis. After thrombectomy PTFE patch closure was done.

Figure 1



Excision of giant aneurysm of the cephalic vein of the forearm with the skin flap technique.

OP-156

A Novel Technique in Aneurysmal Dilatations of the Arteriovenous Fistulas in Hemodialysis Patients

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Purpose: Autogenous arteriovenous (AV) fistulas are the most important dialysis access sites in end stage renal disease patients and aneurysm formation is one of the most common complications in these patients. In this article, we retrospectively reviewed our patients, who were operated because of aneurysmal dilatation of AV fistulas.

Methods-Results: In between January 2011 and June 2013, 23 patients (15 male and 8 female) were operated because of aneurysmal dilatation of AV fistulas. Mean age was 51.8 years (age between 21–85 years). Of these patients in whom 24 surgical procedures were performed, 15 patients had cephalic vein aneurysmectomy and excision, 2 had cephalic vein plication, 3 had basilic vein plication and 1 had basilic vein banding, 2 patients had basilic vein excision. Interestingly, one patient had aneurysmal dilatation of the brachioaxillary biological graft, in whom excision was performed. Usually the AV fistulas were complicated intraaneurysmal thrombus formation and thrombectomy was performed contemporaneously. In giant aneurysm formations, a novel technique was performed by avoiding direct contact of the vein via excision of the vein with the skin flap to avoid complications, such as bleeding and rupture of the aneurysm (Figure 1). This technique also dramatically reduced operational time. Since the cephalic vein is the first choice in AV fistula formation, the most common sites were cephalic vein, but basilic veins reach greater diameters, forming giant aneurysms and complicate the surgery.

Conclusion: Preservation of the AV fistulas should be the first choice of treatment in aneurysmal dilatation of AV fistulas. Since aneurysmal dilatation decreases access sites, it is not always possible to preserve the AV fistula without excision. In order to avoid this complication, different puncture sites should be tried during hemodialysis sessions.

Keywords: end stage renal disease, arteriovenous fistula, aneurysm, hemodialysis

OP-157

The Comparison of Autolog Grafts, Heterolog Grafts and Arteriovenous Fistulas in Chronic Hemodialysis Patients: A Single-Centered and Multi-Surgeon Experience

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Objective: The most appropriate method for hemodialysis is arteriovenous fistulas (AVFs). The formation of autolog or heterolog grafts through AVFs is secondary or tertiary access methods. The aim of our study is to review autolog and heterolog grafts and primary AVFs (only brachiocephalic AVFs) performed with brachial artery in ligth of literature.

Material-Method: One hundred and eigthy-four patients that AVFs were consructed in was retrospectively evaluated with no exclusion criteria in the Department of Cardiovascular Surgery of Konya Training and Research Hospital.

Results: In the study, primary AVFs were performed in 88 patients, and AVFs were performed in 59 patients with autolog grafst, in 24 patients with politetrafloroetilen (PTFE) grafts, and in 13 patients with biological grafts. Mean rates of age and of follow-up

were 57 ± 14, 4 years and 20, 6 ± 13.3 months, respectively. Thrombectomy was conducted in 47 cases. Of 47 cases, AVFs were seen not to work in 11. No statistically significant difference was observed between the fistula working times of those in whom thrombectomy was conducted and not conducted (p >0, 05). Aneurysmectomy was performed in 2 cases. The number of patients presenting with wound site infections was 14, and of these, graft infections developed in 3. Mean age rate of patients was 57 ± 14, 4 years, duration of staying open for PTFE grafts was 23, 2 ± 13, 9 months; for biological grafts, 9, 5 ± 8, 3 months; for autolog grafts, 20, 0 ± 13, 9 months; and for primary AVFs (only brachiocephalic ones), it was detected as 21, 7 ± 13, 3 months. Minimum and maximum working times ranged between 1 and 51 months. A statistically significant difference was determined between PTFE and biological grafts as to working times.
Discussion: In conclusion, AVFs performed with autolog grafts were found to be open longer than those with synthtetic grafts, and so the alternative approach should be autolog grafts unless autogen grafts are performed.

Keywords: arteriovenous fistulas, hemodialysis

OP-158

Correlation Between Preoperative Peak-to-Peak Pulsatility Index of the Brachial Artery and Maturation of a Native Brachio-Cephalic Fistula

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Background: A significant proportion of Brachio-cephalic fistulae (BCF) will fail to mature due to various factors. The compliance of the artery has been identified as one of the factors affecting maturity of the fistula, which is often overlooked in the preoperative work-up. The use of the pulsatility index (PI) has been shown to correlate with the compliance of the artery. This is a value derived from measurements made at duplex ultrasound examination. Reactive hyperaemia from temporary ischaemia causes reduction in peripheral resistance, thus reducing the PI. This is, in effect stimulates the changes seen in an artery after creation of a fistula. The change in the PI is then used to correlate with maturation of the BCF.
Methods: This is a cross-sectional study carried out over a period of 4 months from the January 2012 until May 2012. The study population includes 60 consecutive patients undergoing BCF in the Vascular Unit. The measurement of the preoperative PI of the brachial artery is performed. Compression with a sphygmomanometer cuff for 3 minutes is used to induce the reactive hyperemia and the PI measurement is repeated post compression. The patient then underwent a BCF creation and the maturity is assessed.
Results: The maturity rate of BCF for this study population is 90%. The reduction in PI of brachial artery after compression correlate well with maturity (p <0.001). The mean percentage in reduction of PI that significantly correlate with maturity is 19.8% (p <0.001). Among the patients who had BCFs which failed to mature, the PI increased by 10.1%.
Conclusion: Reduction in the pulsatility index of the brachial artery after induction of reactive hyperemia significantly correlates with maturation of BCFs. This is a relatively simple test which evaluates a parameter which is often overlooked. This could improve the evaluation and thus, the outcome.

Keywords: pulsatility index (PI), brachio cephalic fistula, end stage renal disease

OP-159

The Evaluation of Revision Tecnique Affects on High Velocity Arteriovenous Fistula Patency

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Objective: Steal syndrome occuring in high velocity arteriovenous fistula for hemodialysis is serious problem that can cause some complications including ischemic neurophaty, pain or tissue necrosis can be lead to amputation. Main surgical treatment tecniques for steal syndrome are distal revascularization, interval ligation, banding, T-banding, greft interpozition and arteriovenous fistula ligation.
Methods: Between January 2005–July 2013 1254 patient operated for arterioveous fistula for hemodialysis. In which 86 patients were diagnosed with steal syndrome as clinical and dopler ultrasound evaluation. These patient were treated with arterial pressure controled politetrafloroetilen banding and constriction with sturing tecnique. There were arteriovenous fistula aneurysms on brachio-cephalic and brachio-axillary fistulas occured primary or with graft. During the operation, radial artery pressure and brachial artery pressure was monitorised and radio/brachial index was recorded. Fistulas were constricted until the radio/brachial index was 0.5. In banding tecnique, PTFE greft was used for covering the aneurysmatic segment completely. Flow was decreased by suturing 3 cm venous segment distal to AVF anastomoses was constricted with in the other tecnique. Patients were called for control in one, third, sixth and twelfth months after surgery.
Results: Symptoms of remission were not observed in four patients for first fifteen days and in six patient for first month. Rebanding was performed for these patients. There were no early or late complications for other patients and fistulas were suitable for use hemodialysis in early stages.
Conclusion: In this study we determined that patency rate was 96% for six months and 92% for first year. Formation of trombosis rate was 7% for six months and 9% for first year. Remission rate was 98.72% for steal syndrome. As a result we think that operating

these patiens under radial and bracial pressure monitorisation can decrease reintervention rates doe to the insufficient constriction and risk of trombosis.

Keywords: high velocty, hemidialysis, arteriovenous fistula

OP-160

To Flow and Flow for a Lifetime it Needs to be >249 ml/min at the First Go?

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Aim: To determine the threshold AVF blood flow volume, measured intraop, below which AVF will not mature within three months.
Methods: 134 patients, aged 11 to 74 years, who had AVF flow volume assessed intra-op were followed up to assess maturation rates. The flow rates were recorded at each follow up visit, till the first dialysis.
Results: 96 Radiocephalic (RC AVF) (snuff box 21, wrist 59, forearm 16), 37 Brachiocephalic/basilic AVF and 1 Brachiovencommitantis AVF were included in the study. The overall patency rate was 80.6%. Patients with intraopeartive flow rates 200–400 ml/min had 3 month patency of 91.5%.

Intraop flow >249 ml/min was found to be a significant predictor of the vascular access patency with confidence intervals of 0.528 to 0.849 and an area under the ROC curve of 0.688.

AVF's with intraoperative flow rates <75 ml/min had primary failure rate of 100%.
Conclusion: To mature an AVF needs to generate 350 ml/min of flow volume. Since AVF volume will determine maturity it makes sense to measure it immediately after creation. Flow rates <75 ml/min should be revised on table. Intraop Doppler AVF flow measurements should be apart of protocol in all access units.

Keywords: AVF, flow volumes, colour doppler, patency

OP-161

Flixene Silver Graft for Haemodialysis Access. Early Results of First Prospective Registry Study

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Introduction: Flixene Silver is the newer version of the standard Flixene graft with the additional coating of colloidal silver thereby protecting against early graft infection. This allows for early cannulation avoiding the risk of early infections.
Methods: Prospective registry study as an extension to an initial pilot study to evaluate Flixene Silver graft in haemodialysis patients deemed at high risk for access graft infections. This group was compared to the results from Standard Flixene grafts from our own institution between January 2009 and December 2011. Standard statistical analyses of differences between groups and Kaplan-Meier analysis of AVG patency were performed with Log Rank test to compare patency between groups.
Results: 20 patients had Flixene silver implanted during the pilot study as part of the registry. Our cohort comprises 48% males and 59% Maori. No differences in gender, ethnicity, risk factors and location of AVG were demonstrated between Flixene Silver and standard Flixene grafts. All grafts were used for dialysis and were punctured at 24 to 72 hours post implantation. One graft was infected due to bad needling technique and another had a segmental infection treated with antibiotics. Early patency was similar to standard Flixene grafts and the silver grafts were easier to access by patients and the dialysis nurses.
Conclusions: Flixene Silver grafts have shown encouraging results for early cannulation with no increase in infection rates. Ease of access and puncture of the grafts was an additional advantage. This study is ongoing.

Keywords: flixene silver, antibacterial, vascular access graft, PTFE

Venous disease 1

OP-162

A Comparison of the Party Balloon Assisted Valsalva with Conventional Valsalva Maneuver in Diagnosis of Superficial Venous Valvular Reflux of Lower Limb

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Background: The conventional Valsalva maneuver (CV) is a standard procedure to exhibit reverse venous flow for valvular reflux examination by duplex ultrasonography (DUS). However, some patients especially the elderly patients could not perform CV to demonstrate the reverse flow. It has been reported that blowing party balloon can produce the same effect as CV in various conditions. However, Valsalva by blowing party balloon has not been evaluated in venous reflux examination.
Objective: This study was designed to compare the results of DUS in diagnosis of superficial reflux of lower limb by Party Balloon assisted Valsalva (PBAV) and CV induced reverse venous flow for valvular incompetence examination.
Design of Study: The study design was a prospective randomized controlled trial, cross over study.
Methods: 40 patients who had symptoms and signs suspected saphenofemoral junction incompetence were examined for superficial reflux using DUS with two techniques of Valsalva maneuver, PBAV and CV. Five segments of the deep and superficial veins of

the most affected limb were examined by DUS with CV and PBAV. Patients were randomized to 2 groups. The first group performed CV before PBAV. The other performed PBAV before CV. The timing for the instruction, reflux time, total timing of examination were compared between 2 groups.

Results: There was neither period effect nor treatment-period interaction between the PBAV and CV to examine superficial reflux. Both PBAV and CV could equally identify superficial reflux but teaching time and total examination time in PBAV was shorter than CV.

Conclusions: PBAV was the new option to exhibit reverse flow for superficial reflux examination by DUS. PBAV was easier to perform than CV and took a shorter time for examination.

Keywords: venous valvular reflux, varicose vein, valsalva, standardized valsalva maneuver, duplex ultrasonography

OP-163

Value of Mean Platelet Volume, Mean Platelet Volume/Platelet Count Ratio and Platelet Distribution Width for Predicting Occurence of Pulmonary Embolism in Patients with Deep Venous Thrombosis

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Aim: Mean platelet volume (MPV) is reported to be increased in acute pulmonary embolism (PE). The ease and low cost of MPV, platelet distribution width (PDW) and mean platelet volume/platelet count (MPV/P) testing suggest that it may be useful to predict the risk of deep vein thrombosis (DVT) and venous thromboembolism (VTE). The combined use of MPV, PDW and MPV/P could predict activation of coagulation more efficiently. The aim of this study is to compare MPV, MPV/P and PDW between DVT and VTE subjects and investigate the value of MPV, MPV/P and PDW for predicting occurence of PE in patients with DVT.

Material-Methods: We retrospectively reviewed the medical records of 100 patients who had first-time episode of DVT. Patients were divided into two groups: Group 1 consisted of 50 DVT patients and group 2 consisted of 50 VTE patients. Control group consisted of 50 patients with varicose vein disease. MPV, MPV/P and PDW valeus were measured and compared between groups.

Results: MPV valeus were 8.8 ± 1.3 in group 1; 10.2 ± 1.3 in group 2 and 8 ± 1.1 in control group (p <0.001). MPV/P values were 0.04 ± 0.01 in group 1; 0.05 ± 0.02 in group 2 and 0.03 ± 0.01 in control group (p <0.001). PDW valeus were 13.1 ± 1.7 in group 1; 14 ± 2 in group 2 and 11.5 ± 1.9 in control group (p <0.001).Receiver operator characteristic analysis revealed that a MPV cutoff valeu of 9.35 provided 70% sensitivity and 68% specifity (area under the curve 0.78). A MPV/P cutoff valeu of 0.038 showed 70% sensitivity and 60% specifity(area under the curve 0.7). A PDW cutoff valeu of 13.65 showed 66% sensitivity and 60% specifity(area under the curve 0.65).

Conclusions: MPV, MPV/P and PDW values were significantly increased in VTE patients suggesting that MPV, MPV/P and PDW values can also be used to predict PE in DVT patients.

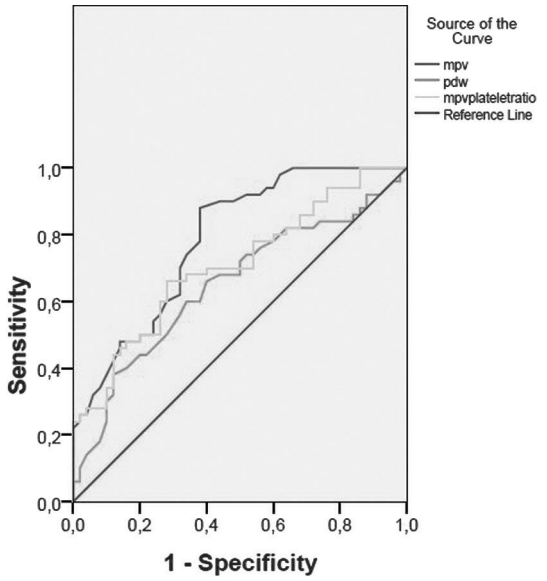
Keywords: deep vein thrombosis, venous thromboembolism, mean platelet volume, platelet distribution width, mean platelet volume/platelet count ratio

Characteristics of patients

	DVT group (n = 50)	DVT + PE group (n = 50)	Control group (n = 50)	p value
Age (years), mean ± SD	40, 56 ± 9, 05	39, 24 ± 12, 37	39, 76 ± 12, 47	0, 84
Sex (M) (%)	50	48	54	0, 83
Body mass index (kg/m²)	25, 59 ± 2, 89	25, 09 ± 2, 57	25, 31 ± 2, 78	0, 66
Hypertension (%)	58	48	50	0, 51
Smoking (%)	32	44	38	0, 46
Hyperlipidemia (%)	24	30	22	0, 63
Glucose, mg/dL	95, 24 ± 9, 38	94, 85 ± 9, 69	94, 8 ± 8, 08	0, 96
Creatinine, mg/dL	0, 9 ± 0, 12	1 ± 0, 1	0, 91 ± 0, 11	0, 7
WBC (10 9/L)	8, 84 ± 2, 65	10, 67 ± 3, 48	6, 91 ± 1, 38	
Hemoglobin (g/dL)	12, 74 ± 0, 96	12, 77 ± 1	12, 73 ± 1, 08	0, 97
Platelet count (10 9/L)	250, 9 ± 65, 85	221, 14 ± 65, 68	308, 7 ± 52, 6	
Mean platelet volume (fL)	8.8 ± 1.3	10.2 ± 1.3	8 ± 1.1	
MPV/P	0, 04 ± 0, 01	0, 05 ± 0, 02	0, 03 ± 0, 01	
Platelet distribution width (fL)	13, 1 ± 1, 7	14 ± 2	11, 5 ±1, 9	

DVT: deep venous thrombosis; PE: pulmonary embolism; MPV/P: mean platelet volume/platelet count ratio; WBC: white blood cells

Receiver operating characteristic curve analysis for MPV, PDW and MPV/P



MPV: mean platelet volume; PDW: platelet distribution width; MPV/P: mean platelet volume/platelet count ratio

OP-164

Mean Platelet Volume, Platelet Distribution Width and Mean Platelet Volume/Platelet Count Ratio Predict Residual Venous Thrombosis After a First Episode of Proximal Deep Venous Thrombosis

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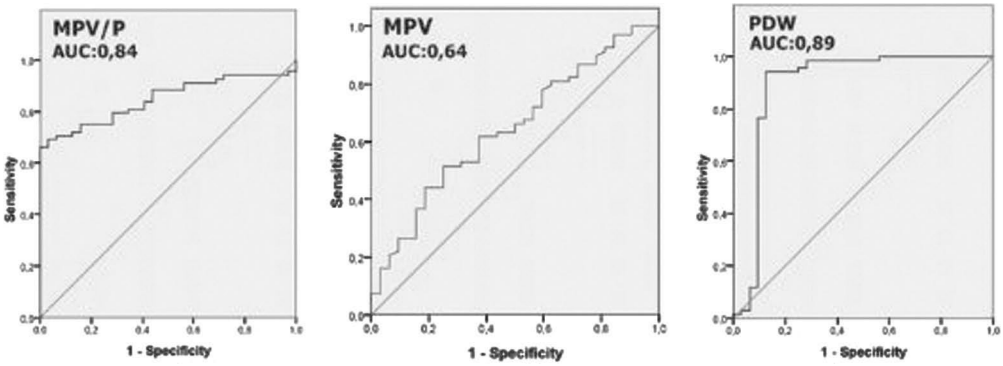
Aim: Residual venous thrombosis (RVT) after deep vein thrombosis (DVT) of the lower limbs is associated with increased risk of DVT recurrence.The aim of the study was to determine whether mean platelet volume (MPV), platelet distribution width (PDW)

Receiver Operating Characteristic curve analysis of D%MPV, D%PDW and D%MPVMPV/P



Δ%MPV: Mean percent changes for mean platelet volume; Δ%MPV/P: Mean percent changes for mean platelet volume/ platelet count ratio; Δ%PDW: Mean percent changes for platelet distribution width; AUC:area under the curve

Characteristics of patients

	Group 1 (n = 68)	Group 2 (n = 32)	Control group (n = 50)	p value
Age (years), mean ± SD	38, 18 ± 10, 38	43, 56 ± 10, 9	39, 76 ± 12, 47	0, 08
Sex (M) (%)	51, 5	43, 8	54	0, 65
Body mass index (kg/m^2)	25, 42 ± 3, 09	25, 17 ± 1, 81	25, 31 ± 2, 78	0, 97
Hypertension (%)	50	59, 4	50	0, 51
Smoking (%)	26, 5	37, 5	38	0, 13
Hyperlipidemia (%)	27, 9	25	22	0, 76
Δ%MPV	–7 ± 4, 9	–10.1 ± 6	–1.11 ± 5.6	p <0.001
Δ%MPV/P	–21.9 ± 14.6	–6.9 ± 6.2	–0.2 ± 9	p <0.001
Δ%PDW	–6.27 ± 4.73	–20.4 ± 8.4	–1.3 ± 1.8	p <0.001

Δ%MPV: Mean percent changes for mean platelet volume; Δ%MPV/P: Mean percent changes for mean platelet volume/platelet count ratio; Δ%PDW: Mean percent changes for platelet distribution width

and mean platelet volume/platelet count ratio (MPV/P) were able to predict the presence of residual venous thrombosis (RVT) after a first episode of proximal DVT.

Materials-Methods: We retrospectively reviewed the medical records of 100 patients who had first-time episode of proximal DVT. Patients underwent compression ultrasonography (CUS) after 6 months. Patients were divided into two groups according to the presence (group 1, n = 68) or absence (group 2, n = 32) of RVT on CUS. Control group consisted of 50 patients with varicose vein disease. MPV, MPV/P and PDW values were measured at diagnosis and after 6 months of oral anticoagulant therapy. The percent change in MPV, PDW and MPV/P after 6 months of oral anticoagulant therapy was calculated and compared between groups.

Results: Mean percent changes for MPV values (Δ%MPV) were –7 ± 4, 9 in group 1; –10.1 ± 6 in group 2 and –1.11 ± 5.6 in control group (p <0.001). Mean percent changes for PDW valeus (Δ%PDW) were –6.27 ± 4.73 in group 1; –20.4 ± 8.4 in group 2 and –1.3 ± 1.8 in control group (p <0.001). Mean percent changes for MPV/P valeus (Δ%MPV/P) were –21.9 ± 14.6 in group 1; –6.9 ± 6.2 in group 2 and –0.2 ± 9 in control group (p <0.001). Receiver operator characteristic curve analysis revealed that an Δ%MPV cutoff valeu of –8,4 provided 64% sensitivity and 57% specifity (area under the curve 0,64). A Δ%MPV/P cutoff valeu of –11,5 showed 80% sensitivity and 72% specifity(area under the curve 0, 84). A PDW cutoff valeu of –15,4 showed 94% sensitivity and 87% specifity (area under the curve 0,89).

Conclusion: Δ%MPV, Δ%MPV/P and Δ%PDW values can be used to predict residual venous thrombosis in patients with a first episode of DVT.

Keywords: mean platelet volume, platelet distribution width, mean platelet volume/platelet count ratio, mean percent change, residual venous thrombosis, deep venous thrombosis

OP-165

Inferior Venacava Tumors

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Inferior venacava tumor is a rare condition. Here we present a series of six case encountered in our institution. Surgical resectability offers the best modality of treatment in experience hands We present a series of six cases treated in our institution.

Keywords: inferior venacava tumor

OP-166

Catheter-Dırected Foam Sclerotherapy for Great Saphenous Veın: Early Results

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Aim: Varicose veins of the lower leg is a common disease and is associated with long-term morbidity. It has been treated using high ligation with stripping and endovenous laser surgery of the great saphenous vein. This study aims to describe a technique for catheter-directed foam sclerotherapy of great saphenous vein insufficiency and reports early results.

Material-Methods: 108 patients with symptomatic varicose veins (C2–4) secondary to GSV insufficiency were enrolled. The great saphenous vein was accessed at knee level. With the method of Tessari 10 mL sclerosant foam was made (2 mL 3% polidocanol and 8 mL air) and delivered along the great saphenous vein while the catheter was withdrawn. At two weeks and at one year after treatment the patients were evaluated.

Results: Catheter-directed foam sclerotheraphy was successfully performed in all of the patients. After one year, 87% of the patients were satisfied. Venous Clinic Severity Score was reduced significantly (p <0,05). Eighty nine percent of the GSV were completely occluded, 4% were partly occluded and 7% were recanalized. No serious side-effects occurred.

Conclusions: Catheter-directed foam sclerotheraphy is a safe, simple and minimally invasive procedure. Patient satisfaction was good and the occlusion rate is promising after a single treatment. Long term results and comperative studies with foam sclerotheraphy and other ablation techniques are needed.

Keywords: great saphenous vein, catheter directed foam sclerotherapy, polidocanol

OP-167

Subfacial Endoscopic Perforator Surgery Ameliorates the Symptoms of Chronic Venous Ulcer (C6) Patients: 3-Year Follow Up

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Aim: Chronic venous insufficiency and the development of venous ulceration, as a result of this condition affects quality of life. In order to avoid skin changes and allow for quick remedy, subfacial endoscopic perforator surgery (SEPS) has been suggested and gained some popularity. The purpose of this study was to assess the healing rate of venous ulcers, mid-term venous ulcer

recurrence and patient satisfaction with subfascial endoscopic perforator surgery (SEPS).

Material-Methods: The SEPS procedure by using two ports was applied in 46 patients with active venous ulceration (CEAP-C6). The results were evaluated by Doppler findings, Venous Disability Score (VDS) and Venous Clinical Severity Score (VCSS) before and after the operation.One year and 3-year follow up results are completed.

Results: All patients were avilable for follow up without any lost. The ulcers healed in all patients (64–89 days). Ulcer recurrence was found in none for one year results, 4/46 (%8, 6) for 3 year results. Six patients had undergone additional vein surgery during follow-up. Incompetent lower leg perforators were noted in 2/46 (Cockett 1) (%4). Previously unknown deep vein incompetence was detected in 7/46 legs (16%), six had axial reflux. Significant clinical improvement according to VDS and VCSS values was obtained in all patients after 1 year and 3 year follow-up, faver to 1 year results. The overall satisfaction was high, 40/46 (87%). Patient satisfaction did not deteriorate over time.

Conclusions: The advantages of using two-port, video-controlled SEPS procedure may provide freedom from the skin complications that can be seen after Linton operation with quick and sustainable ulcer healing. Technically well performed SEPS seems to result in a durable mid-term outcome.

Keywords: subfacial endoscopic perforator surgery, varicose ulcer, leg

OP-168

Comparison of Postoperative Hemodynamic Changes Between High Ligation and Stripping and EVLA in Varicose Vein Surgery Using Air Plethysmography

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Objectives: This study was designed to analysis of the postoperative venous hemodynamic changes in varicose vein surgery to compare between conventional treatment as high ligation and stripping and EVLA using air plethysmographic parameters.

Methods: We retrospectively analyzed 304 limbs of 278 patients who had the conventional treatment and 288 limbs of 227 patients who had the EVLA for great saphenous vein (GSV) reflux from September 2008 to April 2013 at Samsung Medical Center. Venous hemodynamic changes were evaluated by performing air plethysmography preoperatively and 1 month postoperatively and assessing the venous volume (VV), the venous filling index (VFI), the residual volume fraction (RVF), and the ejection fraction (EF).

Results: Preoperatively, median (interquartile range) values were VV, 103.2 (72.9–133.7)mL; VFI, 3.7 (2.2-5.7)mL/s; RVF, 41.3 (30.6–55.2)%; and EF, 53.3 (42.6–64.7). Postoperatively, the median (interquartile range) values were VV, 78.1 (57.8–100.8) mL; VFI, 1.4 (0.9–2) mL/s; RVF, 32.4% (21.9%–45.1%); and EF, 62.5% (48.8%–76.5%). The results were significant for all four variables (P <.001). We compared the degree of hemodynamic changes according to the conventional treatment group, 304 cases and the EVLA group 288 cases. VV, VFI, and RVF of the conventional treatment group were reduced 24.4%, 63.7%, and 25.8%, respectively; EF of the conventional treatment group was increased 19.1%. VV, VFI, and RVF of the EVLA group were reduced 18.8%, 58.9%, and 16.2%, respectively; EF of the conventional treatment group was increased 14.4%. The reduction of the VV, and VFI was greater in the conventional treatment group than in the EVLA group (P <0.034, P <0.008), yet no difference was noted in the EF and RVF increase between the surgical modalities (P <0.069, P <0.105).

Conclusion: Our results show that the conventional treatment group and the EVLA group have similar venous hemodynamic parameters of primary varicose veins in VV, VFI. In contrast, they have different venous hemodynamic parameters in EF, RVF.

Keywords: varicose vein, EVLA, conventional treatment, high ligation and stripping, air plethysmography

Venous disease 2

OP-169

Factors for Varicose Veins

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Objective: The aim of the study was to evaluate a range of potential risk factors in the etiology of varicose veins and to analyze the methylenetetrahydrofolate reductase polymorphisms (MTHFR-677 and MTHFR-1298) and FV leiden mutations in patients with primary varicose veins.

Materials-Methods: We investigated several parameters including body mass index, age, birth number, standing for a long time, systemic diseases, family history, venous doppler fındings, the levels of homosistein, ferritin, vitamin B12, hemoglobin, sedimentation rate, mean corpuscular volume, low density lipoprotein of fourty- nine patients with primary varicose veins and compared these measurements with sixteen healthy control subjects. We also determined the contribution of the methylene tetrahydrofolate reductase (MTHFR) 677 C >T and 1298 A >C gene polymorphisms and FV leiden in these patients.

Results: The ages of the fourty-nine subjects with varicose veins included in our study (study group) ranged between 15 and 85

years (mean 44.04 ± 15, 05 years) and the ages of the sixteen subjects in the control group ranged between 22 and 68 years (mean 40, 94 ± 13, 60 years); BMI value of the patient group was higher than of control group, and difference was insignificant. The patient group included more smokers which is not statistically significant. Diabetes mellutus, hypertension, family history of varicosis, and birth over two children, levels of the patient group were higher than of control group.All differences between groups were found statistically insignificant (p >0, 05). Only standing duration of patient groups was found to be statistically significant (p <0,05). Patients in the study had longer standing duration than control groups.

Conclusion: Heterozygote mutation was dominant in both male and female patients in the patient group. There was no statistically significant difference between patients and control groups based on their baseline characteristics except standing durations of the patients.

Keywords: risk factors, varicose veins, methylene tetrahydrofolate reductase gene polymorphisms, FV leiden

OP-170

Mechanical Thrombectomy with Trerotola Compared to Catheter Directed Thrombectomy in Iliofemoral Acute DVT

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Background: Mechanical thromectomy of acute DVT is safe and effective in reducing thrombus burden. Pharmacomechanical thrombectomy (PMT) with percutaneous thrombectomy device (PTD) has great advantage because it can potentially reduce the dosage of the thrombolytic agents as well as overall procedure time comparing to conventional Catheter directed thrombectomy (CDT). We examined the results of PMT with the Trerotola and factors affecting outcomes.

Methods: This is retrospective study from prospective registered data base of the patients who underwent for acute iliofemoral DVT from January 2005 to December 2011 in single institution. Patients' clinical characteristics, procedures and their results of PMT group with the Trerotola device were compared to those of CDT.

Result: The 98 limbs (left: 76 limbs, right: 22 limbs) of 90 patients (34 men) underwent 53 PMTs and 45 CDTs. There were no statistical difference of clinical characteristics between PMT and CDT group. There were IVC filter in 93 (95%), iliac vein stenting in 64 (65%). The limbs of symptom improvement were 36 limbs (68%) in PMT and 25 limbs (56%) in CDT group. Procedure time was shorter in PMT (723 ± 636 min) than CDT group (1759 ± 564 min) (p <0.001). There was no difference in complications during procedure and patency rate during follow up duration (mean: 16.0 ± 19.1, 0–78 months). There was no factor associating with technical success of CDT and PMT.

Conclusion: PMT with the Trerotola device in acute iliofemoral DVT showed short procedure time and lower urokinase dose with same results comparing to conventional CDT.

Keywords: mechanical thrombectomy, iliofemoral DVT

OP-171

Tumescentless Endovenous Radiofrequency Ablation with Local Hypothermia and Compression Technique

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The modern surgical management of chronic venous insufficiency is possible because of the development of catheter-based minimally invasive techniques, including radiofrequency ablation (RFA) and the application of color doppler sonography. RFA technology requires the use of tumescent anesthesia. It prolongs the operation time, and instilling tumescent anesthesia percutaneously below the saphenous fascia is the steepest part of the learning curve. In our study, we compared the operative and posoperative results of tumescentless RFA and RFA with tumescent anesthesia and investigate the necessity of tumescent anesthesia.

Method: 344 patients with doppler-confirmed great saphenous vein insufficiency underwent RFA between January 2012 and December 2012. Patients were divided into two groups according to the anesthetic management as Group 1 (172 patients: Tumescent anesthesia was given before the ablation procedure) and Group 2 (172 patients: local hypothermia and compression technique was used; no tumescent anesthesia was administered). Visual analogue scale (VAS) and the ecchymosis scores of the patients were scaled. Clinical exam was performed at each visit and doppler usg was performed at 1st and 6th month.

Results: Mean ablation time was definitely lower in group 2 compared to group 1 (7.2 min vs. 18.9 min; p <0.05). Skin burn and paresthesia did not occur. Immediate occlusion rate was 100% for both groups. No significant difference was found between the groups in terms of VAS and ecchymosis scores. All patients returned to normal activity within 2 days. The primary closure rate of G1 was 98.2% and G2 was 98.8% at 6 months and there was no significant difference between the groups (p >0.05).

Conclusion: Eliminating tumescent infusion is a desirable goal. Tumescentless endovenous RFA with local hypothermia and compression technique appears to be safe, efficacious. Our technique shortens the operation time, prevents patient procedural discomfort.

Keywords: radiofrequency ablation, tumescentless, insufficiency of great saphenous vein

OP-172

Comparison of Cutaneous Nerve Injury and Vessel Disruption Complications Following Saphenous Vein Stripping Using Big or Small Olive Heads

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The aim of this study was to identify the incidence of nerve injury and vessel disruption in patients undergoing saphenous vein stripping using olive heads of different sizes in three different groups of patients.

Methods: Patients undergoing great saphenous vein stripping were enrolled in this study. Localizations of varicosities were either above or below the level of the knee or both and were far from the course of the saphenous nerve. Big olive heads were used in group A (n = 50) and small olive heads were used in group B (n = 50) from the ankle to the groin; in group C (n = 50), the vein was stripped in two sections; in an upward fashion by stripping the distal portion from the ankle to the level of the knee using small olive heads and by stripping the proximal portion from the knee to the level of the groin using big olive heads. All the patients were followed up for 6 months postoperatively. Patients were asked specifically about pain, numbness, tingling, burning, altered sensation and weakness.

Results: In total 150 patients were enrolled in this study. At the examination 6 months after the operation, nerve injury symptoms were identified in 13 (26%), 2 (4%), and 3 (6%) patients in groups A, B and C, respectively. Vessel disruption occurred only in 1 patient (2%) in group A, in 16 patients (32%) in group B, and in 2 patients (4%) in group C.

Conclusion: This study demonstrates that saphenous vein stripping using big olive heads for the proximal portion from the groin down to the level of the knee and using small olive heads for the distal portion from the knee to the level of the ankle is the alternative method which results in minimal nerve injury and vessel disruption complications

Keywords: varicose veins, surgery, peripheral nerve injury

OP-173

Treatment for Insufficient Perforating Vein of Lower Limb

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Kobe Ekisaikai Hosipital

Aim: Treatment of Insufficient Perforating Vein (IPV) for chronic vein disease patients was evaluated.

Material-Methods: Fifty-five limbs with IPV in chronic vein disease (CEAP classes C4a-C6) were treated by Sebfascial Endoscopic Perforator Surgery (SEPS) or direct dissection of IPV. Each patient was tested with Duplex ultrasonography and incompetent perforating veins (IPV) more than 3 mm in diameters were marked. Forty-nine limbs were treated by SEPS. Six limbs were treated by dissecting IPV directly via healthy skin incision. Dual port system together with CO_2 insufflation enabled the perforating viens to be dissected by an ultrasonic surgical system. SEPS plus great saphenous vein stripping were performed in 30 cases, SEPS plus small saphenous vein stripping in 3 cases, SEPS plus varicotomy in 9 case, SEPS plus great and small saphenous vein stripping in 1 case and SEPS alone in 6 cases.

Results: In most cases with dermatitis (classes C4a–C5), serious complication was diminished. No upgrade of CEAP classification was happened in these groups. Ulcers in 12 cases out of 15 cases were healed. In 1 case out from 12 healed ulcers, recurrence of ulcer was seen. Minimal surgical site infection at the port-site incision was seen in 3 cases. One patient suffered from prolonged pain and numbness in the foot. The result and wound healing with direct dissecting IPV limbs were also no problem.

Conclusions: SEPS is preferable procedure to treat severe dermatitis and ulcer with incompetent perforating veins. Direct dissection of IPV was also useful when incision on healthy skin was possible.

Keywords: insufficient perforating vein, SEPS, chronic vein disease

OP-174

Lower Limb Venous Disease in Nurses and Female Factory Workers

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Aims: Chronic venous disease (CVD) of the lower limbs is a common health problem, which comprises primary abnormality of venous system and secondary sequels after deep vein thrombosis. The aim of this study is to evaluate the prevalence of lower limb venous disease in female workers and prove that the development of CVD might be triggered by occupational risk factors.
Methods: This cross-sectional study was carried out in 2 groups of female; i.e. nurses and factory worker aged 18–60 years, interviewers administered a questionnaire and interviewed. Physical examination and doppler ultrasound were performed by doctors.
Results: The overall prevalence of chronic venous disease was 44% (96/218); i.e. 26.42% (28/106) in factory worker group (FW) and 60.17% (68/112) in nurse group (N). Most common manifestation was appearance of varicose veins in FW (42.86%, 12/28) and leg swelling in N (73.5%, 50/68). Working hours and standing hours were significant longer in nurses. The most associated risk factor was prolonged standing followed by BMI and family history of CVD. Quality of life which assessed by EQ-5D was lower in nurses who had CVD (0.56 vs. 0.63 in factory workers).
Conclusions: CVD is common in female working population. Occupational factors such as prolonged standing play an important role in the symptomatic disease. It is important to pay attention to female workers especially nurse for risk-factor modification and provide early therapeutic measures to reduce complications and improve quality of life.

Keywords: varicose veins prevalence chronic venous insufficiency

Datacollection

OP-175

Is the Progress of Primary Venous Reflux in the Leg Ascending or Descending?

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Introduction: Already Trendelenburg stated that primary venous reflux spread from sapheno-femoral junction in the distal direction. Recently, several reports showed venous reflux could start from multi-segments of the venous system such as the segment of Great saphenous vein (GSV) at knee level. However, the development of segmental venous reflux in the leg is unclear.

This study was undertaken to examine how venous reflux in the leg develop using duplex ultrasound.
Materials-Methods: 38 cases (45 legs) that could be followed up more than 1 year (1–4 years to 2.4 years) without treatment for varicose vein were selected retrospectively from 385 cases with primary varicose veins that underwent duplex ultrasound examination in 2011. Only 3 in 38 cases wore class II stockings during the follow-up period.

The venous reflux was defined when more than 0.5 second reflux time is found using Duplex ultrasound with distal pneumatic rapid deflation technique at standing position.

The change of venous reflux parts in patients' legs was evaluated on the basis of duplex ultrasound data.
Results: The progression of venous reflux site was found in 17 legs with 2.15 years follow up (12 GSV sites, 2 GSV + deep vein sites, 3 Small saphenous vein sites). In 14 developed venous reflux sites at GSV, descending progression in 4 GSV, ascending progression in 4 GSV, both descending and ascending progression in 1 GSV, and new venous reflux in 5 GSV were found. The regression of venous reflux site was found in 3 GSV with 1 year follow up (2 ascending regression, 1 descending regression).
Conclusions: This study suggests that venous reflux in primary varicose veins develops in ascending as well as descending direction.

Keywords: varicose vein, progression of varicose vein

OP-176

Risk Factors of the Recurrence of Leg Deep Vein Thrombosis

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Aim: The diagnosis of the deep vein thrombosis (DVT) of legs and the detection of DVT recurrence are frequently inaccurate and difficult. The aim of this study was to investigate the risk factors which can predict the recurrence of DVT of legs.

Material and Methods: Between March 2010 and April 2013, the 259 consecutive patients, having signs and symptoms compatible with DVT of legs, underwent blood tests (ABO blood group, d-dimer, antithrombin 3, tissue plasminogen activator (t-pa), Factor 8, Protein C/S, Anticardiolipin Ab IgG/IgM, Lupus anticoagulant, fibrinogen, hemoglobin, platelet, protein, albumin, creatinine) and radiological examinations (computed tomography (CT) venogram or Doppler ultraosonography).

Every individual, diagnosed as having DVT, underwent anticoagulation therapy alone with heparin and warfarin (INR: 2.0–3.0), and anticoagulation with warfarin was continued after the normalization of d-dimer. The d-dimer was tested at least once a month.
Results: Among the 259 patients, the 138 patients (53.3%) were found to have the elevated serum levels of d-dimer. However, of the 138 patients, the radiological exams revealed that only the 74 patients (53.6%) had DVT of legs. Of the 74 patients, the serum d-dimer level was converted to normal in 55 patients (74.3%) during the mean anticoagulation period of 5.27 months. However, among the 55 normalized patients, the 27 patients (49.1%) finally showed the recurrent elevation of d-dimer during the mean follow up time of 4.46 months. In this study, logistic regression analysis showed that the significant risk factors for DVT recurrence were t-pa (B = 0.31, P = 0.028), protein C (B = –0.034, P = 0.017), and hemoglobin (B = –0.579, P = 0.016).
Conclusion: Current study suggests that the recurrence of DVT of legs may be predicted by the hematological indices on initial blood test, especially t-pa, protein C and hemoglobin.

Keywords: deep vein thrombosis, d-dimer, anticoagulation, recurrence

OP-177

Long Term Results of CDT for Iliofemoral Deep Vein Thrombosis

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Aim: The purpose of this study is to examine the effects of catheter-directed thrombolytic therapy (CDT) on long term results in IFDVT (iliofemoral deep vein thrombosis) patients, and to evaluate effects of iliac vein stenting during the later period.
Matrial and Methods: Fifity-six limbs in 51 patients (46 unilateral, 5 bilateral) were included from November 2001 through December 2007. Lytic success was analyzed by reviewing postprocedural phlebograms. All patients underwent postprocedure duplex, CT angiography and or venography to evaluate patency by regular follow up schedule. Limbs were analyzed based on the method of treatment: with stent implantation because of residual stenotic lesion (group: A, n = 37), without stent implantation (group: B, n = 19). The Villalta scale was chosen as the PTS scale. The validated outcome measures were compared between the treatment groups.
Results: The average patient age was 57 years (range, 27–76). Mean follow up duration was 56months (range, 24–144). Follow-up check for venous patency was performed 28.4 months (mean) post-treatment. The Villalta scale was able to be checked for 30 limbs at 57 months (mean) post treatment due to follow-up loss. Overall 5yr primary patency rate was 66.1%, in group A: 77.8%, in group B: 42.1%, and showed statistical difference between groups, p = 0.02. Villalta scale were 3.37 and 4.46, respectively. Overall incidence of mild PTS was 8/30 (26.7%), in group A: 4/13 (30.8%) and in group B: 4/17 (23.5%). Overall recurrence rate of deep vein thrombosis were 10/37 (27.0%) and 11/19 (57.0%). Of all these factors showed no statistical difference between groups.
Conclusions: Long term resuts of catheter-based intervention for IFDVT was acceptable, and stent implantation to the iliac segment to correct the underlying disease seems to be good effect on the long term results. So, It should be recommend CDT and simultaneous stenting to improve long term results of IFDVT, if indicated.

Keywords: long term results, catheter directed thombolyis, iliofemoral deep vein thrombosis

OP-178

The Effects of Genetic Mutations' Being Isolated or Combined on Deep Venous Thrombosis and/or Pulmonary Embolism Occurrence

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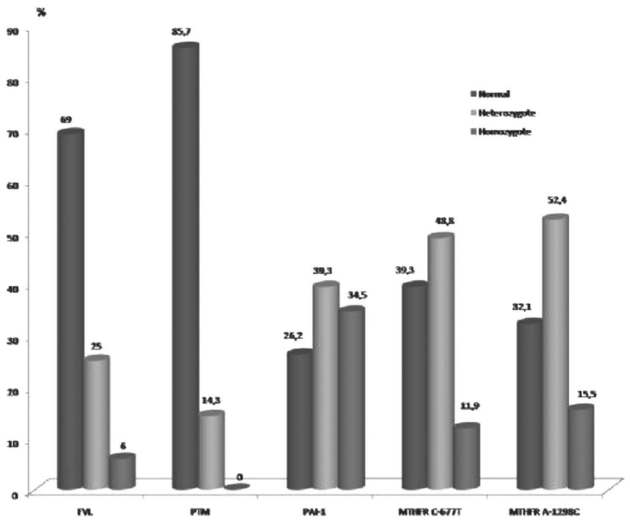
Aim: Although deep vein thrombosis and thromboembolic diseases show difference among various races, they are still important in our day. The difficulties in treatment and following-up of these diseases are caused by secret genetic mutations rather than predisposing factors.
Material Methods: Between the January 2011 and May 2013, the patients, who were traced for deep vein trombosis and/or pulmonary embolism, were evaluated retrospectively. 84 patients (53.6% male and 46.4% female) were included in the study. Their family histories, predisposing factors and treatments were researched. Factor V leiden (G 1691A), factor II G20210A, Plasminogen Activator Inhibitor-type 1, Methylene tetrahydrofolate Reductase (C677T, A1298C) mutations were searched from peripheral venous blood.
Results: Within the genetic mutations we searched, the incidence of single mutation rate was observed as 11.9%, double mutation collocation as 44%, triple mutation collocation as 29.8%, quartiles

mutation collocation as 13.1%, and finally, quintuplet mutation collocation as 1.2%. Our approximate mutation number was found as 2.47 ± 0.91.

Conclusion: We were observed that multiple mutations were high in number compared to single genetic mutations. The patients who have multiple mutations should be more in the front line considering their diagnosis, treatment and following up, and also in terms of decreasing mortality, morbidity, recurrence.

Keywords: deep venous thrombosis, pulmonary embolism, genetic mutation

Figure 1



The frequency of mutations and sub-groups.

OP-179

Cost-Utility Analysis of Endovenous Procedures Compared to Surgery in Thailand

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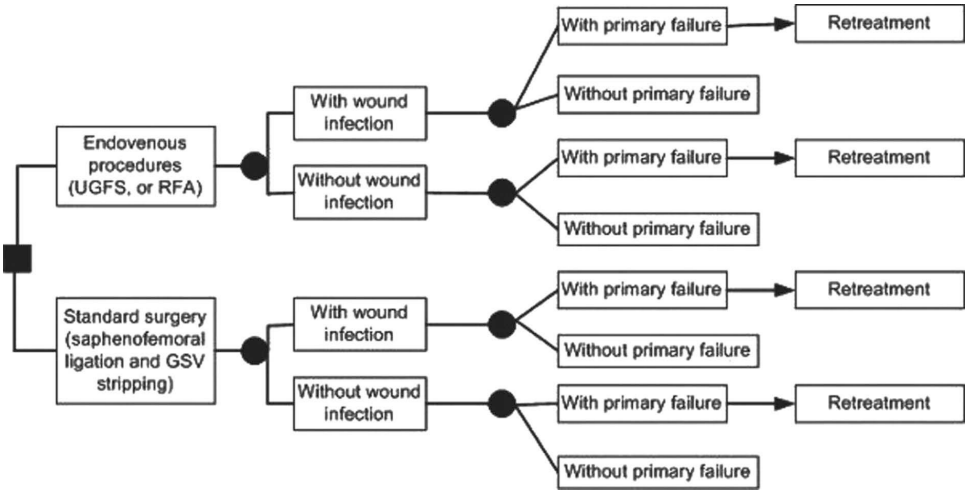
Aim: To do cost-utility analysis comparing endovenous procedures (i.e. radiofrequency ablation (RFA) and ultrasound-guided foam sclerotherapy (UGFS)) to surgery in varicose vein in Thailand.

Material and Methods: A multicenter prospective cohort including patients with varicose vein or ankle edema whom met eligible criteria from October 2011 to February 2013 were done. A decision tree analytic model was used to calculate incremental cost-effectiveness ratios (ICERs) comparing costs per quality adjusted life year (QALY) gained using a societal perspective. Input parameters including efficacy, direct costs, indirect costs and utility were obtained from systematic review and meta-analysis, standard Thailand's costing list, and study respectively.

Decision tree analytic model



Model's assumption: All patients with primary failure will undergo retreatment. Retreatment were done by outpatient UGFS with success. GSV, greater saphenous vein; UGFS, ultrasound guided foam scierotherapy

Input parameters for cost-utility analysis

Parameters	RFA	UGFS	Surgery	P value	Sources
Efficacy and RR					
- Primary failure*	—	—	0.07	NA	Study
- Relative risk of primary failure	1.3 (0.7, 2.4)	2.4 (1.6, 3.6)	—	NA	Meta-analysis
- Wound infection *	—	0.15	0.15	NA	Study
- Relative risk of wound infection	0.3 (0.1, 0.7)	—	—	NA	Meta-analysis
Direct medical costs					
- Preoperative	4, 669	4, 669	4, 669	NA	Standard cost lists ‡
Procedure	26, 417	5, 556	5, 096	NA	Standard cost lists ‡ and company
- Retreatment	5, 839	5, 839	5, 839	NA	Standard cost lists ‡
- Wound infection	1, 917	1, 917	1, 917	NA	Standard cost lists ‡
Direct non-medical cost					
- Inpatient procedure +	1625 (1550, 1700)	2040 (1000, 2350)	1260 (940, 2145)	0.28	Study
- Outpatient procedure +	700 (520, 860)	—	—	NA	Study
- Cost of cares +	600 (300, 1650)	1200 (600, 1200)	1950 (975, 3330)	0.04	Study
- Cost per visit +	741 (500, 1400)	800 (510, 1200)	600 (415, 985)	0.17	Study
Indirect cost					
- Productivity loss +	750 (600, 1200)	300 (300, 1500)	1500 (900, 2550)	0.007	Study
- Productivity loss of wound infection +	1500 (900, 2, 850)	1500 (900, 2, 850)	1500 (900, 2, 850)	NA	Study
Postoperative utility gain					
- At 1 week (U-Gain1) #	0.176 (0.234)	0.051 (0.271)	0.084 (0.277)	0.267, 0.547 (RFA, UGFS compared to surgery)	Study
- At 1 month (U-Gain2)	0.225 (0.231)	0.195 (0.218)	0.304 (0.249)		Study
- At 6 months (U-Gain3)	0.203 (0.244)	0.291 (0.261)	0.210 (0.246)		Study

** Percentage, + median (interquartile range), # mean (SD) Relative risk (95% confidence interval) as compared to surgery ‡ Health Intervention and Technology Assessment Program (HITAP) (www.hitap.net/en/research/10495) NA, not applied; RFA, radiofrequency ablation; UGFS, ultrasound-guided foam sclerotherapy*

Parameter uncertainty was assessed using probabilistic sensitivity analysis performed by Monte Carlo simulation.

Results: Thirty one RFA, 19 had UGFS, and 27 had surgery were recruited. Postoperative Venous Clinical Severity Scores (VCSS) improvement were similar between groups. RFA had significantly higher procedure-related costs (21, 000, 5, 556, and 5, 096 baht for RFA, UGFS, and surgery respectively). RFA and UGFS had significantly advantages over surgery in term of shorter time to normal activities and work, reduce productivity loss, and cost of postoperative care. RFA had non-significant trend of higher utility gain at 1–2 week but this was not at 1 and 6 months postoperatively. With minimum wage of 300 baht per day, ICERs of UGFS as outpatient treatment was dominant to surgery due to less cost with higher QALY. RFA had negative ICERs due to higher cost but less QALY gain.

Conclusions: UGFS as outpatient treatment may be the most suitable procedure in Thailand. Due to high procedure-related cost of RFA and similar long term QALY, RFA was still not cost-efficient enough to be suitable to be covered by health care system. However, if minimum wage increases it may be cost-efficient. Currently, it should be pay as willingness to pay.

Keywords: radiofrequencey ablation, foam sclerotherapy, varicose vein, cost-utility, economic evaluation

Venous disease 3

OP-180

Radical Superficial Vein Removal for the Treatment of Venous Ulcer

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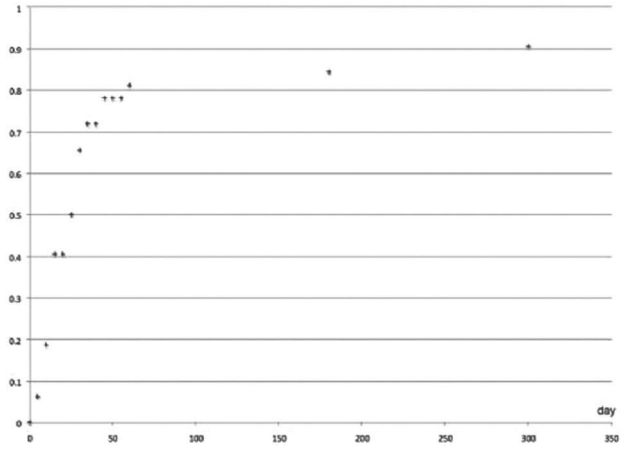
Background: Previous studies suggested that Thai CVI has higher prevalence of superficial venous reflux and lower prevalence of previous DVT.

Objective: To assess the results of superficial venous eradication combine with compression therapy in Thai.

Methods: Retrospective cohort of C5–6 patents who had complete duplex ultrasonography and clinical record.

Results: There were 34 C5–6 legs in 27 patients (October 2006 to February 2013) for analysis with the median follow up time of 20 month. Of the 32 C6 legs, 24 legs had primary surgery and 8

Proportion of healed c6 patients over time



legs (6 patients) had surgery for the recurrent ulcer. All reflux segments were removed surgically. The wound healing was achieved in 29 legs (91%) with the median healing time of 21 days (mean 44 day). The 30 days healing rate was 69% (20 legs) and the 14 days healing rate was 41% (12 legs). Only 3 legs in two patients that the ulcer healed beyond 60 days. The post operative VCSS and VDS of the 35 C5, C6 legs, were significantly improved compare with pre-operative value (pre-operative and follow up VCSS and VDS were 12 (6–19), 3.6 (0–13) and 1 (0–3), 0.4 (0–2) respectively, p = for VCSS p <0.0001 and for p = 0.0042 VDS). The recurrent ulceration was found in 4 legs at the mean follow up time of 30 months (ranges 1–76 months). The 2 and 3 years recurrent rate were 4 percent and 25 percent respectively.

Conclusion: Satisfactory results from superficial vein surgery could be obtained in Thai patients. The radical removal of peri ulcer refluxtive vein in this series may responsible for this results.

Keywords: chronic venous insufficiency, superficial vein surgery, Thai, Asia

OP-181

IVC Filters: A 5 Year Report Card

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Aim: To audit IVC filter usage in our practice.

Material-Methods: Data was collected from case records and discharge summaries. Period of study was from June 2008 to June 2013.Heads for data collection included Source of referral, Indications for insertion, Choice of filter, Complications/adverse events during deployment, retrieval dates and adverse events during retrieval.

Results: Total patients studied were 104.Majority (41/104) of referrals were directly to the vascular services thru emergency services of the hospital. Surgeons (largely orthopedics 16/22), physicians and intensivists were the other sources of referrals. Pulmonary Embolism and/or proximal DVT with a contraindication to anticoagulation/pharmacological thrombolysis formed the largest indication (62/104), though a sizable number (31/104) were in association with pharmaco-mechanical thrombolysis. The Cook (Celect) device (46/104) and Bard (G2X) filter (34/104) were used in the majority of cases though the Optease (Cordis) and other devices were also used in some cases. Complications in deployment included Tilting (3 cases each of the Cook and Bard devices), though migration, failure to open fully were also seen. Only 74 of the 104 cases came up for retrieval (rest lost to follow-up/death). Average date for retrieval was 6 months, with the earliest being attempted at 3 weeks. There were 19 failures to retrieve: with the highest failure rates in terms of % being the Optease/Cordis (11/18).

Conclusions: It was encouraging to note the recognition of the vascular surgeon as being the person sought for an endovascular procedure in India. Irretrievability remains an issue even in India. The lack of availability of mechanical thrombectomy devices, resulting in catheter suction thrombectomy being used by most specialists, justifies the use of filters. Moreover, the procedure of retrieval of a filter adds to the cost, significantly contributing to the delay in presenting for the same by a patient.

Keywords: IVC filters, complications, retrieval

OP-182

Endovenous Laser Ablation in the Treatment of Recurrent Varicose Veins

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Aim: To identify the site and cause of recurrent varicose veins despite prior surgical intervention, and to assess the role of endovenous laser ablation in the treatment of recurrent varicose veins.

Materials-Methods: A retrospective chart review over a five year period (2007–2012) of patients who had endovenous laser ablation (EVLA) was performed. All EVLA were performed in a single vein specialty center. This study focused on patients with recurrent varicose veins (rVV) despite prior vein "stripping" surgery. The survey group included: presence of varicose veins despite prior high ligation and vein "stripping" after 2000, during the endovenous era. Duplex ultrasound was used to assess the site and cause of rVV. We analyzed how often limbs in the survey group could be retreated with EVLA.

Results: 2263 EVLAs were performed between May 2007 and December 2012. 219 patients had prior surgery and lower extremity venous problems. The survey group (rVV, and vein "stripping" after 2000) included 71 patients with 95 limbs. Average age was 49.4 years (range, 32–74). 84% were women. Surgery occurred a median of 7 years previously (range, 1–12 years). Deep venous insufficiency in 10/95 limbs (11%). 72% were C2

and C3 (CEAP classification). rVV were associated with: fully intact or segmental residual great saphenous vein in 61 (64%) limbs, perforator vein pathology in 28 (30%) limbs, accessory vein reflux in 26 (27%) limbs, small saphenous vein reflux in 20 (21%) limbs, and neovascularization or pelvic veins in 12 (13%) limbs. EVLA was feasible in 69 limbs (73%). Concurrent EVLA of a second vein was done in 23 cases, and all patients had adjunctive treatment with phlebectomy, foam sclerotherapy, or a combination of modalities.
Conclusions: EVLA is feasible and effective in many patients with rVV despite prior great saphenous vein "stripping."

Keywords: endovenous laser ablation, recurrent varicose veins

OP-183

Distribution of Asymptomatic Calf Vein Thrombosis and Perioperative Thrombus Recurrence

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Aim: Patients who undergo surgery are at risk for venous thromboembolism, which is higher in those with prior deep vein thrombosis. As the public and medical concern for the risk associated with deep vein thrombosis has increased, the number of cases with asymptomatic calf vein thrombosis (CVT) detected by preoperative duplex scanning has grown rapidly in the current clinical practice. The purpose of this study was to demonstrate the distribution of thrombi and to determine the incidence of perioperative thrombus recurrence in patients with asymptomatic CVT.
Methods: Ninety-three limbs of 71 patients (9 men and 62 women with a mean age of 73 years), who were diagnosed as having asymptomatic CVT by duplex scanning before surgery and also had a follow-up images within 30 days after surgery, were included in this study. Of the deep veins in the calf, the peroneal, the posterior tibial, the gastrocnemial, and the soleal veins were routinely examined. The location of thrombi, prophylactic measures, and incidence and patterns of recurrence were evaluated.
Results: No significant difference was noted for the limb preference (45 left vs 48 right). The soleal veins were most frequently involved, with 83 limbs (89%) affected. The peroneal veins were involved in 18 limbs (19%), followed by the gastrocneminal in 9 limbs (10%) and the posterior tibial in 8 limbs (9%). Although the majority of patients received anticoagulation as prevention of venous thromboembolism, 4 had only compression therapy. Overall, 15 of 71 patients (21%) developed thrombus extension or new-site thrombus in the perioperative period.
Conclusion: Our data revealed that the majority of asymptomatic calf vein thrombi were located in the soleal veins and a substantial number of patients with even asymptomatic CVT developed thrombus recurrence perioperatively.

Keywords: calf vein thrombosis, asymptomatic, perioperative thrombus recurrence, duplex scanning

OP-184

VNUS Closure Fast Procedure Performed Under Femoral Block

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We refer 56 patients whose underwent VNUS ClosureFAST procedure under femoral block.
Method: Patients received US guided femoral nerve block with 1.5% lidocaine VNUS Closure FAST was performed using cold tumescent fluid without any additional substrate. Patients recorded a pain score on a visual analogue score (VAS) 1 hour after the procedure and third day after the procedure. Cohort characteristic of our patient ñ 6 males (16%) and 47 females (84%), the mean standard deviation age of the patients was 53.5 ± 13.3 years (range 28 to 62 years), CEAP distribution: C1- 5%, C2- 80%, C3- 13%, C4-6–2%, mean GSV diameter was 5.9 ± 2 mm (range 4.0 to 14.0 mm).
Results: The average total endovenous procedure time was 19.4 ± 8.2 minutes, an average of 388 ml NaCl of tumescent was used per procedure. All GSV were completely occluded, in one patient we found recanalization after 6 month. 1 pt developed mild bruise of the tight, 1 pt referred paresthesia within first 4 hours after surgery. All the patients were mobilized within 4 hours after the surgery. Overall, patient satisfaction was very good. 95% (53/56) of the patients replied that they were willing to undergo the same treatment again. VAS score (pain experienced during the procedure) taken 1 hour after the procedure was 3 (0–6). On day 3 after the procedure the average score was 2 (0–6). The average return to normal daily activities was 2 days (0–10). 40% of the patients needed pain medication within first 3 days after procedure (1000 mg paracetamol per day).
Conclusion: Femoral nerve block would provide complete anesthesia throughout the VNUS ClosureFAST procedure giving better per- and postoperative analgesia with acceptable comfort for the patient. The total amount of local anesthetic is significantly less than in traditional tumescent anesthesia.

Keywords: VNUS closure fast, endovenous ablation, femoral block

OP-185

The Role of Ischemia Modified Albumin in Patients with Deep Venous Thrombosis

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Aim: To investigate the usefulness of ischemia-modified albumin (IMA) in diagnosis of deep venous thrombosis (DVT).

Material-Methods: In this cross-sectional study, we prospectively collected the medical data of 55 consecutive patients (32 male; 58, 2%, 23 female; 41, 8%) with DVT admitted to Hitit University Çorum Education and Research Hospital. The age-gender matched 25 healthy subjects (22 male; 46, 8%, 25 female; %53, 2) were used as control group. Inclusion criteria were patients with acute and chronic DVT. The diagnosis of the DVT was based on the venous Doppler USG reports. We obtained the blood samples of the patients and the control group for IMA analysis. Patients with ischemic diseases such as acute coronary artery disease (CAD, clinical, and ECG evidences of myocardial ischemia i.e., angina pectoris, segmental wall motion abnormalities in echocardiography, ischemic changes in ECG or known CAD), stroke or infection were excluded from the study because of the possibility of false positive high IMA levels.

Results: Patient group was compared with control group according to the IMA levels. It was observed that there was no statistical significant difference between patients with DVT and controls. There was not also statistical difference between patients with acute and chronic DVT or postphlebitic syndrome.

Conclusions: There are limited studies in the literature investigating the usefulness of IMA in patients with DVT. There are also studies revealing that IMA levels increase in patients with DVT. In our study, as a result, we could not confirm that IMA levels can be used as a useful parameter for the diagnosis in patients with DVT and postphlebitic syndrome.

Keywords: ischemia-modified albumin, deep venous thrombosis, postphlebitic syndrome

OP-186

The Effect of Anticoagulation on Acute Portal and Splenic Vein Thrombosis After Hepatobiliary and Pancreatic Surgery

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Aim: Acute portal and splenic vein thrombosis (APSVT) after hepatobiliary and pancreatic surgery (HBP) is a rare but serious complication and its treatment strategy has not been well established. Most surgeons are resistant to anticoagulation therapy because of the risk of post-operative bleeding. We assessed the safety and efficacy of anticoagulation in APSVT after HBP in terms of bleeding complication and recanalization rate and associated factors with recanalization.

Material-Methods: A retrospective case-control study was carried out on 82 patients, who were diagnosed with APSVT within 4 weeks after HBP from October 2002 to November 2012 at a single institute. We compared anticoagulation group (n = 32) vs. no anticoagulation group (n = 50) for 3 months in terms of patients' characteristics, complications and recanalization rate of APSVT.

Results: Mean diagnosis date of APSVT was 8.6 ± 4.8 days after HPB. Main characteristics were not different between two groups. There was no bleeding complication associated with anticoagulation therapy. Univariate analysis revealed that recanalization rate of APSVT was significantly higher in anticoagulation group than in no anticoagulation group (81.2%, 26/32, vs. 48%, 24/50, P = 0.003, 95% CI 1.648–13.372), and a significant correlation with shorter operation time (P = 0.047, 95% CI 1.001–6.225). In multiple logistic regression analysis, independent factors associated with recanalization rate of APSVT were anticoagulation therapy (P = 0.001, OR 9.048, CI 2.378–34.426) and the absence of vein reconstruction procedure (P = 0.008, OR 6.656, CI 1.629–27.190).

Conclusion: Anticoagulation therapy is thought to be a safe and effective treatment after HBP in the patients with APSVT. A further prospective study with a larger population size will be necessary.

Keywords: acute portal and splenic vein thrombosis, anticoagulation, recanalization, hepatobiliary and pancreatic surgery

OP-187

The Role of Venoruton® in Prevention of Venous Insufficiency Among Patients with Calf Muscle Pump Dysfunction

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Objective: To evaluate the role of Venoruton in prevention of venous system disease among patients with calf muscle pump dysfunction as a result of immobilisation due to lower-limb fractures.

Methods: A total of 60 patients with lower-limb fractures immobilized in plaster casts were included in this study randomized into control (n = 30; mean: 30.37 ± 6.03 years; 73.3% males; no treatment) and experimental (n = 30; mean: 31.67 ± 4.76 years; 66.6% males; Venoruton Forte (Oxerutin®, 500 mg) treatment) groups. Doppler ultrasound was performed to evaluate the effect of Venoruton on the alterations in the venous circulation.

Results: Patients in the control group were determined to be more commonly affected by below-knee immobilization in terms of venous insufficiency in the vena saphena magna in the below-knee region compared with patients under Venoruton treatment (46.7 vs. 13.3%, respectively; p = 0.011). Augmentation reflux in the vena saphena parva was more common in the control group compared with patients under Venoruton treatment during the healing period (40.0 vs. 10.0%, respectively; p = 0.017). None of the patients developed venous thrombosis. Six month follow-up revealed no significant difference in venous insufficiency between both groups.

Conclusions: In conclusion, the impairment of the lower extremity muscle pump should be considered as an important risk factor for venous insufficiency, and should be evaluated. Venoruton during 6–8 week cast immobilization for a lower limb fracture is an effective prophylactic regimen against venous insufficiency in the distal crural veins.

Keywords: oxerutin, calf muscle pump dysfunction

OP-188

Giacomini Projection of the Lesser Saphenous Vein and Associated Operative Strategy in Lesser Saphenous Vein Stripping

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Objectives: 'Giacomini vein' is the term used to describe the thigh extension branch of the lesser saphenous vein. It courses the posterior thigh as a trunk projection of the lesser saphenous vein. Although its existence has minor importance in majority of patients with varicose disease, missing its existence during the surgical treatment of varicosities of lesser saphenous vein may cause catastrophic results. In this article we aimed to present prevalence of Giacomini vein, and the strategies to prevent related undue complications.

Materials-Methods: Between January 2011 and May 2013, Two hundred and fifteen patient records were reviewed retrospectively in order to investigate Giacomini vein prevalence in young adult patients who underwent venous surgery due to varicose veins. Data regarding the mean age of the patients, existence of varicose dilatation of Giacomini vein and association with lesser saphenous vein tortuosity, and common variations of Giacomini vein were analysed.

Results: The age of patients were 21.54 ± 0.81 (min: 21, max: 25). A hundred and sixty-nine patients underwent great saphenous vein stripping plus venous pack extirpation, and twenty-eight patients underwent lesser saphenous vein stripping plus venous pack extirpation and eighteen patients underwent only venous pack extirpation.

Conclusions: It should be kept in mind that saphenopopliteal junction level demontsrate variations. Missing this information may result in catastrophic complication such as popliteal vein tearing during lesser saphenous vein stripping in the presence of low-level saphenopopliteal junction.

Keywords: giacomini vein, lesser saphenous vein, operative strategy

OP-189

New Criteria of Treatment Guidelines for Incomplete Removal of Varicose Vein

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Aims: Endovenous laser treatment is one of the most widely accepted method alternative to stripping surgery. However incomplete removal of varicose vein is the main cause for the recurrence. The aim of this study was to assess feasibility of new inclusion criteria guidelines for incomplete removal of varicose veins.

Material-Methods: Between July 2008 and June 2013, 318 patients were treated with endovenous laser treatment with combined miniphlebectomies. 60 patients (111 great saphenous veins, 84 small saphenous veins) were diagnosed as incomplete removal of varicose vein after EVLT. The first inclusion criteria of incomplete removal of varicose vein was patient's perception of the unsatisfactory outcome such as symptomatic recurrence in great or small saphenous veins. Second, asymptomatic recurrent veins were noted. Third, the spider type varicose veins or small tributary veins still remained regardless of recurrent varicose vein. Postoperative duplex ultrasound is obtained to determine the presence of venous reflux. Computed tomographic venogram was performed in selected patients such as obese or edematous patients to rule out deep vein thrombosis. Re-EVLT was applied primarily in the first criteria patients. The second and third criteria patients were treated with sclerotherapy under the basis of patient's perception. Follow up with duplex scanning at regular interval was performed for 2 months to 5 years.

Results: Among the 60 patients, 8 (13%) patients (first criteria) were treated with Re-EVLT or phlebectomies at average 24 months after EVLT. 15 (25%) patients(second criteria) showed asymptomatic recurrence and 10 (17%) patients (second criteria) had more probable chance of recurrent surgery in the future. 27 (45%) patients (third criteria) were treated with sclerotherapy at average 5 months after EVLT. Among 27 patients, only 2 (3%) patients performed Re-EVLT.

Conclusions: New criteria of incomplete removal of varicose vein after EVLT plays a role to inform treatment guidelines. Especially sclerotherapy is very helpful to prevent recurrence.

Keywords: recurrent varicose vein sclerotherapy endovenous laser treatment

OP-190

The Rate and Mortality of Post Operative Venous Thromboembolism in High and Moderate Risk Surgery in Asian Patients without Thrombo-Prophylaxis: Systematic Review with Meta-Analysis

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Post operative venous thromboembolism (VTE) is a common life threatening complication in western countries. However, controversy regarding to the incidence in asia exists. This review analyzed the rate and mortality of post-operative VTE of high and intermediate operation in Asia.

Methods: Inclusion criteria were: Prospective study; deep vein thrombosis (DVT) diagnosed by venography ultrasonography or radionucleotide scan and no thromboprophylaxis. The pooled proportion was back calculated from Freeman-Tukey variant transformation, using random effect model.

Results: Twenty-two studies hip or knee orthopedic surgery (total population, 2454) published from 1979 to 2009 were included for high risk surgery pooling and 14 general, gynecologic and neurologic studies (total population of 1625) published from 1974 to 2008 were included for moderate risk surgery polling. There results were summarized in the table.

Conclusions: There was no report of pulmonary embolism mortality. The rate of proximal DVT, symptomatic VTE was lower than the western reports, majority of the DVT occurred in the distal vein.

Keywords: deep vein thrombosis, asia, postoperative

Post operative VTE rate

	High risk surgery (Hip and knee orthopedic surgery)	Moderate risk surgery		
		General	Gyneclogic	Neurological
All site DVT rate	31.7%(venogram) 9.4% (ultrasound)	13.4% (radionucleotide scan)	3.1% (radionucleotide scan)	3.8% (ultrasound)
Proximal DVT rate	8.9% (venogram) 5.9% (ultrasound)	2.1% (radionucleotide scan)	na	na
Isolated distal DVT rate	18.8% (venogram) 5.8% (ultrasound)	14% (radionucleotide scan)	na	na
Symptomatic DVT rate	4.3%	1.5%	0.17%*	1.0%
Symptomatic PE rate	0.8%	0.4%	0.17%*	0.2%*
PE mortality	0.2%*	0.2%*		

* calculated rate, no actual incidence

Post operative VTE rate in high and moderate risk surgery

Venous disease 4

OP-191

Clinical Risk Factor of Pulmonary Embolism in Patients with Deep Vein Thrombosis

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Purpose: Pulmonary embolism (PE) is the lethal complication of deep venous thrombosis (DVT). The aim of this paper was to compare the clinical characteristics between the DVT with PE group and the DVT without PE group and to find clinical risk factors significantly and independently associated with coincident DVT/PE.

Methods: In the setting of a referral hospital, patients with DVT underwent duplex ultrasound (DUS) and/or computed tomography (CT). PE was evaluated by pulmonary embolism CT. We analyzed the clinical risk factors associated with PE in patients with DVT. In statistical analysis, we used unpaired t-test and multivariable logistic regression model.

Results: We examined 114 patients (age 62.7 ± 16.9 years, 41.7% men) with DVT with/without PE. The prevalence of concurrent DVT/PE was 52.6%. Neither the risk factors nor blood tests differed significantly between the groups. Of all the assessed patients characteristics (age and sex, BMI, diabetes, hypertension, history of varicose vein, previous DVT, history of surgery, infection, pneumonia, coronary artery disease, chronic renal failure, and paralysis) only one factor was significantly and independently associated with PE. Infection was significantly higher in the patients with PE (P = .04).

Conclusion: The prevalence of concurrent DVT/PE in patients with DVT, referred to hospital vascular clinic was 52.6%. Infection was significantly and independently associated with concurrent DVT/PE. Our results should be further investigated in a larger prospective study.

Keywords: pulmonary embolism, deep vein thrombosis, risk, factors

OP-192

Endovenous Laser Ablation of Great Saphenous Vein with Ultrasound-Guided Early Results

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Endovenous laser ablation (EVLA) is an improved method to treat varicose great saphenous veins (GSV) with a high satisfactory rate. This study aimed to evaluate of treatment and VAS by EVLA procedures with ultrasound-guided perivenous tumescence.

184 patients (184 limbs) with symptomatic varicose vein primary to chronic venous insufficiency (CVI) CEAP 4-6 treated with EVLA were prospectively studied. The entire procedure was performed under ultrasound-guided tumescent local anesthesia. The patients were evaluated with a 6 month follow-up postoperation using clinical examination and venous duplex ultrasonography. Pain scores and quality of life (QOL) were recorded using visual analog scale (VAS) at 1 week, 1 month, and 3 months after operation.

All patients tolerated EVLA procedure well. The overall success occlusion rates of Great Saphane Vein were 92%, 94%, and 94% at 1 week, 1 month and 3 months follow-up, respectively.The VAS one month after treatment was lower than 1 week before therapy ($t = 8.048$, $P < 0.05$). Major complications such as deep vein thrombosis and were not found. Skin burns 4 patient performed. Following the treatment, all patients were informed and asked to complete a diary card for 7 days to record their level of pain. They were asked to use the VAS (0 cm for no pain and 10 cm for the worst pain possible), which was provided at the time of discharge. At the first postablation follow-up, patients were questioned about whether they took the recommended analgesic drugs and if so, on which day they perceived the maximum amount of pain. Also at the follow-up of 1 month, patients were informed to complete a diary card to record their level of pain again. The new developments could potentially reduce the risk of the complications, but accurate evaluation is needed.

Keywords: endovenous laser ablation, great saphenous vein, occlusion

OP-193

New Experiences in the Treatment of Deep Vein Thrombosis: Pharmacomechanical Thrombolysis Practices

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Purpose: Treatment of acuteili of emoral vein thrombosis with only-anticoagulation are at high risk of developing post thrombotic syndrome (PTS). Immediate removal of the thrombus by pharmaco mechanical thrombolysis (PMT) techniques may increase patency, prevent damage of the venous valves, and prevent reflux and PTS. The aim of this study to evaluate the efficacy of PMT in the treatment of deep vein thrombosis (DVT).

Materials-Methods: Since December 2012, 14 symptomatic limbs in 13 patients with acute or subacute ilio femoral DVT that under went PMT utilizing Cleanerô thrombecto my device (Argon Medical Devices, Inc., Plano, TX) were included in the study. Following prophylactic placement of inferior vena cava filters

(IVCFs), using popliteal access, and PMT, with low-dose t-PA, was performed in all patients. At the end of the procedure patency was confirmed by contrast venography.

Results: Fourteen limbs in thirteen patients, 9 males and 4 females under went pharmacho mechanical thrombolysis for DVT. The patients presented with symptom save ranging 16.7 (5–30) days in duration, 6 had symptoms for >14 days. The average administered dose of t-PA was 29.2 mg per patient and duration of procedure was 60.3 (40–120) minutes per limb. Thrombus removal was less than 50% in one limb, 50%–95% in eight limb, and at least 95% in five limb. Major bleeding was observed in one patient and necessitated blood transfusion. No DVT recurrence and symptomatic relief was observed in every patient to follow-up during a mean of 3.8 months.

Conclusions: Pharmaco mechanical thrombolysis with the The Cleanerô device is an effective therapeutic option in the treatment of acute DVT to restore venous patency. Rapid restoration of patency may be associated with sustained valve function and a decreased incidence of post-thrombotic syndrome. İn addition, this therapy is a minimally invasive with low-risk, and associated with clinical benefits including thrombus removal, patency, and relief of symptoms.

Keywords: thrombosis, thrombolysis, pharmaco-mechanical, venous; patency

OP-194

Evaluation of Decreased Serum Prolidase Activity in Patients with Recurrent Venous Ulcers

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Backgrounds: Prolidase is a cytosolic exopeptidase and has an important role in collagen metabolism, matrix remodeling and cell growth. Relationship between serum prolidase activity and leg ulcers has been previously investigated and documented. Herein we assumed that decreased prolidase activity may play a substantial role in healing process in patients suffering from chronic venous insufficiency with recurrent venous ulcers (RVC) and we compared the levels of serum prolidase activity before and after the surgical treatment of chronic venous insufficiency in patients with RVC and healthy subject.

Methods: Eighteen patients suffering recurrent venous ulcer were enrolled to the study. Seventeen volunteers who have no venous insufficiency and ulcer were included to the control group. Each patient in study groups had multiple four layer bandage therapies at least one time during their medical theraphy. Doppler ultrasonography showed grade IV saphenous vein insufficiency reflux in study group. Prolidase activity was measured by ELISA and compared statistically.

Results: Mean age was 42.45 ± 11.14 in study group and 38. 24 ± 9.04 in control group (p = 0.247). Gender distribution was also similar between groups. (p = 0.122) Mean prolidase activity was 552 ± 244.06 mU/ml in study group but 730.29 ± 243.12 mU/ml in control group. A difference between groups was found statistically significant (p <0.05).

Conclusion: Recurrent venous ulcer is a complicated problem in patients with end stage chronic venous insufficiency. Decreased prolidase activity demonstrated in our study may reduce collagen biosynthesis and cause recurrence of venous ulcer.

Keywords: recurrent venous ulcer, chronic venous insufficiency, prolidase activity

OP-195

Evaluation of the Effect of Endovenous Ablation Catheters in the Junctional Segment

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Aim: Endovenous ablation catheters are widely used in the reflux of saphenofemoral junction (SFJ). However, protection of axial venous flow and patency of femoral vein is crucial therefore it is recommended to start thermal ablation 2 cms below the SFJ. According to this, the effect of different endovenous ablation catheters and sources were compared, and resultant histopathological changes were investigated in an in vitro venous vessel ablation model.

Material-Methods: A total of 40 pieces of 8–10 cm long stripped saphenous vein segments were gently resected and filled up with heparinized blood, put into tumescent solution and divided in 4 groups according to different ablation protocols as follows: In Group A, 10 watt energy/20 joule/cm^2/1470 nm laser; in Group B, 10 watt energy/25 joule/cm^2/1470 nm laser; in Group C, 20 watt at 120 °C/radiofrequency; in Group D: 25 watt 120 °C/radiofrequency. 2 cm long segment of each vein from the tip of ablation source, was divided to 3 mm long segments, and prepared for routine histopathological examination and a total damage scoring system (the presence of endothelial swelling, intimal thickening, cellular vacuolization in the muscle layer, edema in the tunica media and extent of necrosis) was used to evaluate the segment of

veins 2 cms away from the source.
Results: The total damage score for each group demonstrated no significant difference. Subgroup examination of each group presented that proximal 0.6 mm of the ablated veins were protected. The highest damage score was calculated in Group A at a near significant level ($p = 0.057$).
Conclusion: In our knowledge, this is the first preliminary ex-vivo study evaluating histopathological changes in the vein wall due to the endovenous ablation. Endovenous ablation catheters exerts a certain amount of pathological damage at the junctional level of venous wall and needs further clinical investigations.

Keywords: endovenous, laser ablation, radiofrequency, saphenofemoral junction, histopathology

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Significance of Complete Blood Cell Count Parameters as Biomarkers for Deep Venous Thrombosis

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Introduction: Laboratory markers for thrombosis are being investigated in recent years. Thromboembolic disease is thought to be associated with complete blood count parameters, especially as mean platelet volume and neutrophil/lymphocyte ratio. MPV is associated with platelet function and activity, and N/L ratio are considered to show prognosis in cardiovascular events. We aimed to investigate if there is a tendency for differing levels of blood cell count parameters in deep venous thrombosis compared to normal population.
Methods: Between January 2012–April 2013, 200 patients were included into the study. Complete blood cell count analysis and Doppler ultrasonography results were analysed retrospectively for all the patients. Patients were divided into two groups: Group 1 including 100 patients with ultrasonographically documented deep venous thrombosis and Group 2 consisting of 100 patients with documented normal Doppler ultrasonography findings. White blood cell levels, red blood cell and platelet levels, haemoglobine, neutrophil/lymphocyte ratio, red cell distribution width, mean platelet volume (MPV) and MPV/platelet ratio were compared between two groups. Statistical analysis were made to evaluate if a relationship exists between these hematologic parameters and thrombosis.
Results: Both groups were compared statistically for all parameters separately. Mean platelet volume and MPV/platelet ratio, red cell distribution width (RDW) and neutrophil/lymphocyte ratio seem to have a positive correlation with deep venous thrombosis.
Conclusion: It is easy to obtain these simple hematologic examinations and this study is to show that these parameters may be meaningful for the risk of deep venous thrombosis.

Keywords: deep venous thrombosis, neutrophil/lymphosite ratio, mean platelet volume

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Association of Post-Thrombotic Syndrome Development with Homocysteine Levels and Complete Blood Cell Count Parameters

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Objective: Post-thrombotic syndrome (PTS) is a common complication of deep venous thrombosis (DVT). Diagnosis is usually clinical by physical examination and can be subjective. Homocysteine levels and parameters in complete blood cell counts (CBC) are used as biomarkers of thromboembolic events. This study investigates the relationship between objectively diagnosed PTS using Villalta scoring system with homocystein levels and CBC parameters.
Methods: Seventy patients with chronic deep venous thrombosis who were regularly seen in outpatient clinic were included. They were questioned about prior thrombosis events, types of medications, compression stockings wear, surgical history and Villalta scores were calculated. Homocysteine levels and CBC were recorded. Statistical analysis was made to evaluate any relationship between PTS development and homocysteine levels, white blood cell count, neutrophil/lymphocyte ratio, red blood cell distribution width (RDW) and mean platelet volume (MPV).
Results: Forty-seven patients (58.7%) were male. Mean age was 51.3 years (ranging between 16–80). One patient had vena cava inferior thrombosis, 22 had iliofemoral thrombosis, 35 had superficial vein and distal thrombosis and 22 had popliteal vein thrombosis. Left leg was involved in 38 patients, right leg in 40 patients and bilateral disease in 2 patients. Among these patients, 31 had a Villalta score of less than 5 indicating no PTS. Thirty-seven patients had a Villalta score between 5–14, indicating mild or moderate PTS and 12 had severe PTS with a Villalta score >15. PTS development did not correlate with neutrophile/lymphosite ratio, mean platelet volume, RDW and homocystein levels but had a strong correlation with mean corpuscular volume.
Conclusion: This pilot study demonstrates positive correlation between PTS and MCV. Utilisation of these parameters may be useful for PTS diagnosis along with Villalta scoring.

Keywords: post-thrombotic syndrome, homocysteine, villalta scala