

comparisons showed no difference for any outcome (wound healing HR = 0.947, $p = 0.849$ and amputation HR = 0.971, $p = 0.906$). All trends were lost in diabetic patients alone ($n = 149$, 69% of group).

Conclusion: In this the largest series of combined angioplasty in the literature there was no advantage in opening up all the tibial vessels with angioplasty if the angiosome directly supplying the ischaemic tissue could be opened. The angiosome model does not appear valid, however, in diabetic patients.

Long Term Risk for Peripheral Arterial Disease Patients is Higher Among Men

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Introduction: The introduction of modern cardiovascular risk preventive therapy and new endovascular treatment options may have influenced the long term mortality and morbidity in patients with peripheral arterial disease (PAD). The aim of this study was to determine long-term survival and incidence of leg revascularizations in subjects with PAD with special focus on gender differences.

Methods: A cohort study was started 2004 by randomly selecting 8000 subjects, aged 59–89 years, from the population. A total of 5080 subjects participated and underwent ankle brachial index measurements (ABI). Data was also collected for risk factors and concomitant diseases. The cohort was re-examined 2015 covering data from national governmental registries on survival and surgical interventions for PAD.

Results: The point-prevalence of PAD in 2004 was 11 % (95% CI, 9–13) for subjects having only asymptomatic PAD (APAD), 7% (6.5–7) for intermittent claudication (IC) and 1.2 % (1–1.5) for those with severe limb ischemia (SLI). Among the 4926 subjects who were available for follow up at 10 years the mortality rates were 50% for APAD, 59% for IC and 72% for SLI. Subjects without PAD had a rate of 24%. Mortality was higher among men (age adjusted 35.9% 95% CI: 34.2–37.6) than women (26.1% 95% CI: 24.7–27.6) likewise in PAD subjects with diabetes mellitus (68% vs. 52% without, $p < 0.001$). Factors significantly related to increased mortality were for men and women, respectively; SLI (HR 1.87 and 1.87), congestive heart failure (HR 1.69 vs. 2.44), renal failure (HR 1.4 vs. 2.2) and diabetes (HR 1.51 vs. 1.65). Fifty one subjects underwent revascularization because of chronic leg ischemia in the cohort during the ten years. In the reference group the rate was 0.4%, while it was 1.9 % of APAD subjects, 5.8 % of the IC and 6.2% of the SLI group.

Conclusion: The mortality is still high in patients with PAD, and half of patients with APAD are dead within 10 years which is comparable with IC patients. The mortality is higher in men than in women. In a population based cohort like this, very few patients were revascularized, and surprisingly few patients with IC and SLI are offered vascular surgery. Overall, more focus on mortality in PAD is needed and there is still a need for information about vascular surgery to GP's offices and awareness among PAD subjects.

Oral Prostacycline Analog and Clopidogrel Combination provides Early Maturation and Long-term Survival after Arteriovenous Fistula Creation: A Randomized Controlled Study

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Introduction: Vascular access is used as a lifeline for hemodialysis in patients with end stage renal disease failure (ESRD). Failure of arteriovenous fistula (AVF) maturation is still high. The purpose of this study was to research the effects of clopidogrel in combination with oral iloprost, a synthetic analog of prostacyclin PGI₂.

Methods: Ninety-six diabetic ESRD patients were divided into two groups. In the first group (Group 1, $N = 50$), clopidogrel (75 mg daily dose) and an oral prostacycline analog (200 mg daily dose) were administered. In the second group (Group 2, $N = 46$), placebo was given. All patients were taking study medication 7–10 days prior to surgery. A Doppler ultrasonographic (USG) examination was performed for measurement of arterial

and venous diameters, and peak systolic velocity of arterial flow based on subsequent fistula adequacy. Autogenous AVFs were constructed in forearm as distally as possible in all patients. Both groups were followed-up for a year.

Results: In the placebo group, early AVF thrombosis was detected in two patients (4.3%). AVF maturation failure was noted in 14 patients (30.4%) in placebo group and in four patients (8%) in clopidogrel plus oral prostacycline analog group in the early post-operative period ($P = 0.001$). The mean maturation time was 38 ± 6.5 and 53 ± 12.8 days in study and placebo groups, respectively ($P = 0.023$). The mean blood flow was 352 ± 94 mL/min in placebo group and 604 ± 125 mL/min in study group ($P = 0.001$). The arterial end diastolic velocity was 116 ± 14 cm/s in study group and 72 ± 21 cm/s in placebo group ($P = 0.036$) 1 year after the surgery.

Conclusion: Our data indicated that clopidogrel and oral prostacycline analog as a potent arterial dilator seems to be effective and safe for the prevention of primary AVF failure in hemodialysis patients and decreased acute and chronic thrombotic events of AVFs.

Radiation Dose of Cone Beam Computed Tomography and Computed Tomography during EVAR: A Patient and Phantom Study

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Introduction: The use Cone Beam Computed Tomography (CBCT) enables the acquisition of 3D images intra-operative. This advantage might reduce the need of early Computed Tomography Angiography (CTA) follow up (FU) since technical success is improved. It is however known the CBCT adds a considerable amount of radiation to the intervention. This study is quantifying the CBCT radiation in comparison to conventional 1 month FU CTA in order to increase the awareness of the operator in the intra-operative setting.

Methods: Radiation dose of CBCT (DynaCT, Siemens) and FU CTA of 30 patients was prospectively studied. The CBCT consisted of two different protocols and was compared with two different CT scanners (Somatom 16 and Flash, Siemens). The FU CTA included three phases. Conversion factors were used to calculate effective dose in order to be able to compare CBCT and FU CTA radiation dose. An anthropomorphic phantom was used as comparison and a TG200 phantom enabled the direct comparison of the accumulated radiation, without the need of conversion factors.

Results: Mean age was 73 years and average BMI was 27.5. CBCT radiation contributed with a mean DAP of 66.0 Gy cm^2 (37.1–94.4). The 3 phase FU CTA had a mean DLP of 948.7 mGy cm (421–1422). A CBCT of 5 seconds corresponded to one third of that of a 16 slice FU CTA. An 8 second spin was 87% of that of a 128 slice FU CTA. Accumulated radiation from the CBCT ranged from 44% to 99% in comparison to the complete FU CTA.

Conclusion: CBCT adds a considerably amount of radiation to the patient during an EVAR procedure. The comparison between CBCT and CT depends on what type of CBCT protocol and how efficient the CT scanner is. This study showed that performing an intra-operative 8 second CBCT is equivalent to a complete FU CTA, consisting of three CT scans. Further optimization of CBCT protocol in regard of image quality and intra-operative results ought to be investigated.

Role of Hybrid Procedures in the Treatment of Iliac Femoral Occlusive Disease

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Introduction: At aorta-iliac district for occlusive disease the first choice have become endovascular procedures because offer excellent results in terms of patency, low mortality and morbidity rates. Stenosis/occlusion to the femoral artery may reduce the patency and the technical success rate of the endovascular procedures. In these cases a hybrid approach with femoral endarterectomy and iliac stenting may be considered. We

evaluated the results in patients treated by hybrid and traditional surgery in order to establish if these procedures could be considered as the first choice.

Methods: We performed a retrospective study analyzing a frame time of 13 years in order to identify patients with iliac femoral atheromatous disease (TASC II C/D). Primary end points have been considered the primary patency rate, limb salvage and survival rate. Secondary end points such as secondary assisted patency, re-interventions and complications rate.

Results: We identified 178 limbs in 168 patients (100 vs. 78 limbs treated respectively with Open and Hybrid approach). In the Hybrid group 86% of the patients were classified as ASA III/IV vs. 31% in Open group. Median age was 68 vs. 75 respectively per open and hybrid group. Indication for hybrid procedures was given in 93 limbs but after an accurate pre-operative study with Angio-CT scan we excluded 15 limbs due heavy calcification in 13 patients classified as ASA III/IV that underwent to extra-anatomic repair. The technical success was 91.7% vs. 100% (Open versus Hybrid). Primary patency in Open vs. Hybrid group at 1, 5 years was respectively 98%, 99% vs. 7.5%, 96.1%, assisted patency at 1, 5 years 99%, 98% vs. 98.7%, 97.5%, limb salvage at 1, 5 years 99%, 98% vs. 96%, 93.5%. 30 days mortality and at 1, 5 years were 5.6% e 28.4% vs. 1.2% e 25.6% Open vs. Hybrid group. Similar post-operative complications rate (6%) were observed in both groups, but 8.1% of open group needed admission intensive unit care.

Conclusion: Hybrid procedures offered good results in terms of patency and limb salvage rate and with a low 30 mortality in patients classified at high risk for surgery. Similar survival rates between the 2 groups despite the high co-morbidities and older age that characterized the Hybrid group. Considering the good results the hybrid procedures could be considered as the first choice, but in some patients the anatomic arterial features remain the main limitation that still need traditional repair.

Comparison between Aorto-bifemoral Bypass and Aorto-iliac Kissing Stent in Patients with Complex Aorto-iliac Obstructive Disease

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Introduction: To retrospectively compare early and late results of aorto-bifemoral bypass and endovascular recanalization with the kissing stent technique in the management of TASC II C and D lesions in the aorto-iliac district in a multicentre study.

Methods: From January 2006 to December 2013, 293 open and endovascular interventions for TASC-II class C and D aorto-iliac obstructive lesions were performed at three Italian teaching hospitals. In 210 patients the intervention was performed for aortic and bilateral iliac involvement: an aorto-bifemoral bypass was performed in 82 patients (Group 1) while in the remaining 128 an endovascular recanalization with the kissing stent technique (Group 2). Early results in the two groups were compared with χ^2 test. Follow up results were analyzed with Kaplan-Meier curves and compared with log rank test.

Results: There were no differences between the two groups in terms of demographic data, comorbidities, or risk factors for atherosclerosis, except for a higher percentage of females and of diabetic patients in group 2. Critical limb ischemia was present in 29 patients in group 1 (35.5%) and in 31 patients in group 2 (24%, $p = 0.07$). Technical success in group 2 was 98.5%; two patients required immediate conversion to open surgery for iliac rupture. There was one peri-operative death in group 1 (mortality rate 1.2%, $p = 0.2$ in comparison with group 2). Four peri-operative thromboses occurred; two in group 1 and two in group 2 (in one case requiring conversion to open surgical intervention) and no amputations at 30 days were recorded. Post-operative local and systemic complications occurred in 20 patients in group 1 (24%) and in 13 patients in group 2 (10% $p = 0.006$). Mean duration of follow up was 39 months (range 1–108 months). Survival rates at 6 years were 65% (SE 0.07) in group 1 and 82% (SE 0.05) in

group 2 ($p = 0.07$). At the same time interval, primary, assisted primary and secondary patency rates were similar; re-intervention rates were 6% in group 1 (SE 0.05) and 11% in group 2 (SE 0.04; $p = 0.2$).

Conclusion: Endovascular repair of complex aorto-iliac lesions with the kissing stent technique, in the multicentre experience, provided similar satisfactory early and late results to those obtained with open surgery, however with a lower rate of peri-operative complications and a trend towards better long-term survival.

Long Term Outcomes of Common Femoral Artery Endovascular Repair

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Introduction: The common femoral artery (CFA) is an unusual location for endovascular repair (ER). However, previous reports have showed that it was a safe technique with acceptable clinical outcome at 1 year. The aim of this manuscript is to report 5 year outcomes after primary stenting of the CFA and its bifurcation for occlusive disease.

Methods: Between 2006 and 2008, 36 consecutive patients (mean age 67.9 years, range 51–92) (40 limbs) underwent primary stenting for CFA lesions. Patients were followed up systematically within a prospectively maintained database over 5 years. Follow up included clinical examination, duplex scan and biplane x-ray at 1, 6, and 12 months and yearly thereafter. Data of 2 patients are lacking because they are waiting for their duplex scan results.

Results: Indications for endovascular repair of the CFA included 25 patients (70%) for claudication and 11 patients (30%) for critical limb ischemia. Forty-three stents were implanted. The mean follow up was 64 months (range 9–108 months). Two patients were lost of follow up. The mortality rate at 5 years was 38%. At 1 and 5 years, primary sustained clinical improvements were 80% and 75% respectively. In-stent restenosis rate was 22%. Freedom from target lesion revascularisation was 85% and 76% at 1 and 5 years, respectively. One stent fracture was noted in the first year follow up and no other stent fracture was noted during the remainder of the study. No risk factors (age, sex, diabetes, stage of peripheral artery disease, types of CFA lesions, types of stents) were significantly associated with in-stent re-stenosis or stent fracture at 5 years.

Conclusion: Endovascular repair of CFA and its bifurcation seems to provide a sustained clinical and morphological results at long-term. The fear of stent fracture and local complications due to the hip mobility are no longer relevant.

Trends and Outcomes of Carotid Endarterectomy and Carotid Stenting in Germany Between 2003 and 2013 -- Results from the German Mandatory National Quality Assurance Registry

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Introduction: Since 2003 carotid endarterectomies (CEA) and since 2012 carotid artery stenting procedures (CAS) are documented in a mandatory nationwide quality assurance registry. This study analyses management trends in patients treated by CEA or CAS in Germany over a 11 year period.

Methods: Annual reports of the "Bundesgeschäftsstelle Qualitätssicherung (BQS)" and the "Institute for Applied Quality Improvement and Research in Health Care (AQUA)" from 2003 to 2013 were reviewed. Trends in patients characteristics, peri-procedural variables and outcomes were statistically analysed by the Cochran-Armitage-Trend-Test. Descriptive data are given as mean or median.

Results: 1. 282.603 CEAs and 11.993 CAS procedures were performed (male 68.3%). The proportion of patients >80 years increased significantly from 10.9% to 15.7% ($p < 0.001$). Indication groups were: asymptomatic (mean rate: CEA: 52.7%, CAS: 47.3%), symptomatic (CEA: 34.7%, CAS: 25.9%) and special indications (e.g. emergency procedures, recurrent stenosis, carotid aneurysms (CEA: 12.6%, CAS: 26.5%).