

Results: There were 23 consultations performed for hand ischemia related to radial artery catheters. Compared to nonischemic controls consulted patients were more likely to have shock ($P=.002$), sepsis ($P=.01$), and be receiving anticoagulation ($P=.04$). Twelve patients (52%) required surgical revascularization; thrombectomy (91.7%), intraoperative thrombolysis (58.3%), vein patch angioplasty (33.3%), and intraoperative angiography (50%). In patients who underwent revascularization, 2 required digital amputation, 1 required major upper extremity amputation, and 2 patients died. In patients who underwent nonoperative management, none required amputation. Overall mortality was 22% in patients requiring vascular consultation and 17% in those requiring operation for radial artery catheter ischemic complications.

Conclusions: Fifty-two percent of patients with ischemic complications of radial artery catheters require operation and mortality is high. Patients with shock and sepsis are more likely to develop radial catheter-associated upper extremity ischemia. Those requiring revascularization have a high rate of digital or major upper extremity amputation.

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SI: William J. von Liebig Forum

SS1.

Impact of Transfusion and Nadir Postoperative Hemoglobin on Short- and Long-term Outcomes after Interventions for Peripheral Arterial Disease (PAD)

Panos Kougias¹, Sonia Orcutt², Peter H. Lin², George Pisimisis¹, Neal R. Barshes¹, Carlos F. Bechara¹. ¹Michael E. DeBaakey VAMC, Houston, TX; ²Baylor College of Medicine, Houston, TX

Objectives: Controversy surrounds the topic of transfusion policy after non-cardiac operations. This study assessed the combined impact of postoperative nadir hemoglobin (nHb) levels and blood transfusion on adverse events after open surgical intervention in patients with PAD.

Methods: Consecutive patients ($n=1182$) who underwent PAD-related operations were matched on propensity scores calculated as their probability to have nHb more or less than 10gm/dl on the basis of operation type, demographics and comorbidities, including the revised cardiac risk index. Logistic and Cox proportional hazards regressions were used to assess the impact of nHb and number of transfused units on 1) a composite endpoint (CE) of death, myocardial infarction and stroke; 2) respiratory and wound complications.

Results: After adjusting for nHb level, the number of units transfused was a strong predictor for the perioperative occurrence of the CE (OR, 1.12, $P=.02$) and respiratory complications (OR, 1.27, $P=.004$). Adjusted for the num-

ber of units transfused, nHb had no impact on the perioperative CE (OR, 0.6, $P=.3$) or respiratory events (OR, 0.40, $P=.17$). An interaction term between transfusion and nHb level remain non-significant ($P=.543$), indicating that the impact of blood transfusion was the same regardless of nHb level. Perioperative wound infections were less common in patients with nHb > 10gm/dl (OR, 0.59, $P=.04$), whereas transfusion had no impact on wound infection rates (OR, 0.98, $P=.84$). During an average follow up of 24 months transfused patients were more likely to develop the CE (HR, 1.13, $P=.02$), whereas nHb level did not impact the long term adverse event rate (HR, 0.7, $P=.26$).

Conclusions: Blood transfusion increases the incidence of perioperative and long-term mortality and cardiovascular adverse events regardless of the associated nHb. It also increases the risk of perioperative respiratory complications. A restrictive transfusion strategy is justified in patients with PAD.

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SS2.

The Impact of Arterial Pedal Arch Quality and Angiosome Revascularization on the Outcome of Distal Bypass Surgery

Hani Slim, Hany Zayed, Michael Edmonds, Hisham Rashid. Vascular Surgery, King's Collage Hospital, London, United Kingdom

Objectives: To evaluate the impact of pedal arch quality on the amputation-free survival and patency rates of distal bypass grafts and also its direct impact on rate of healing and time-to-healing of tissue loss following direct angiosome revascularization in patients with critical limb ischemia (CLI).

Methods: Between 2004 and 2011, patients undergoing distal bypass for CLI (Rutherford 4-6) were divided in groups taking in consideration the state of the pedal arch and direct angiosome revascularization (DAR) and non-DAR. Based on angiography, the pedal arch was divided into 3 groups; complete pedal arch (CPA), incomplete pedal arch (IPA) and no pedal arch (NPA). Kaplan-Meier was used to analyse patency rates at 12 months, amputation-free survival at 48 months, the rate of healing and time-to-healing of tissue loss.

Results: Total of 167 bypasses was included in the analysis. 31(19%) had CPA, 104 (62%) IPA and 32 (19%) had NPA. Incidence of diabetes mellitus and chronic renal failure was similar in all groups. The primary and secondary patency rates at 1-year as well as the amputation-free survival at 48 months for all groups were: CPA, 58.4%, 86.0% and 67.2% ($P=.5168$); IPA, 54.6%, 84.7% and 69.7% ($P=.8940$); and NPA, 63.8%, 88.8% and 45.9%

($P=.3883$). Out of the 167 bypasses, 141 had foot tissue loss. In the CPA group 93% of tissue loss with DAR healed (median time-to-healing; 56 days) compared to 100% in the non-DAR (98 days). Similarly in the IPA group 95% with DAR healed (106 days) compared to 90% in the non-DAR (94 days). While in the NPA group only 75% with DAR healed (81 days) compared to 73% in the non-DAR (148 days). There was only statistical significant difference in the time-to-healing between CPA/IPA versus NPA group ($P=.0141$).

Conclusions: The quality of the pedal arch did not influence the patency or the amputation-free survival rates. However, the healing and time-to-healing rates were directly influenced by the quality of the pedal arch rather than the angiosome revascularized.

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VS1.

Video Presentation

Ultrasound for the Diagnosis and Treatment of Popliteal Entrapment Syndrome

Marlin W. Causey, Thomas Curry, Reagan Quan, Charles Andersen, Niten Singh. Madigan Army Medical Center, Ft. Lewis, WA

Background: Popliteal Entrapment Syndrome is a rare cause of claudication in the young population. These patients are typically referred to multiple specialists prior to their diagnosis and optimal treatment. Ultrasound has commonly been used as an adjunct to clinical diagnosis in most outpatient clinics. We describe additional techniques of using intravascular ultrasound for diagnosis when angiography is performed. More importantly, this video highlights the intraoperative use of ultrasound to ensure an adequate and optimal myectomy when treating popliteal entrapment syndrome as well as an ability to survey the arterial wall for intimal injury with B mode duplex.

Technical Description: Patients are most commonly diagnosed clinically with popliteal entrapment syndrome. During the time of angiography, intravascular ultrasound is able to demonstrated distinct compression of the popliteal artery with active plantar flexion. Palpation has traditionally been used to assess the adequacy of resection for popliteal entrapment but this may prove to be inadequate with some patients and intraoperative ultrasound allows assessment of the adequacy of resection. We also perform B mode duplex after complete resection to survey for intimal changes that may not have been seen during the preoperative workup.

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SS3.

Infrapopliteal Angioplasty for Critical Limb Ischemia: Results at 5-year Follow-up

Ruby C. Lo, Rodney P. Bensley, Kristina A. Giles, Jeremy D. Darling, Mark Wyers, Allen D. Hamdan, Elliot Chaikof, Marc L. Schermerhorn. Beth Israel Deaconess Medical Center, Boston, MA

Objectives: Infrapopliteal angioplasty (PTA) is routinely used to treat critical limb ischemia (CLI) despite limited data on long-term outcomes.

Methods: We reviewed all patients undergoing infrapopliteal PTA for CLI from 2004 to 2011 stratified by TASC class. Outcomes included restenosis, primary patency, reintervention (w/ PTA or bypass), amputation, complications, and survival.

Results: Infrapopliteal PTA (stenting 14%, multilevel intervention 50%) was performed in 447 limbs of 401 patients (59% male) with technical success of 95% and perioperative complications in 11%. TASC composition was 17% A, 22% B, 29% C, and 35% D. All technical failures involved TASC D lesions. Mean follow-up was 15 months. 5-year survival was 46%. One- and 5-year primary patency was 55% & 36% and limb salvage was 84% & 81%. Restenosis was associated with TASC C (HR 2.1, 95%CI 1.1-3.8, $P=.021$) and TASC D (HR 2.1, 95%CI 1.0-4.0, $P=.036$) lesions. Amputation rates were higher in patients who were not candidates for bypass (HR 4.3, 95%CI 2.5-7.3, $P<.001$) and with TASC D lesions (HR 3.7, 95%CI 1.1-12.4, $P=.032$). Together, freedom from restenosis, revascularization or amputation was predicted by bypass non-candidacy (HR 1.6, 95%CI 1.1-2.4, $P=.007$) and TASC C (HR 1.8, 95%CI 1.1-3.0, $P=.024$) and TASC D (HR 2.0, 95%CI 1.2-3.3, $P=.011$) lesions but not multilevel intervention (HR .9, 95%CI 0.6-1.2, $P=.462$).

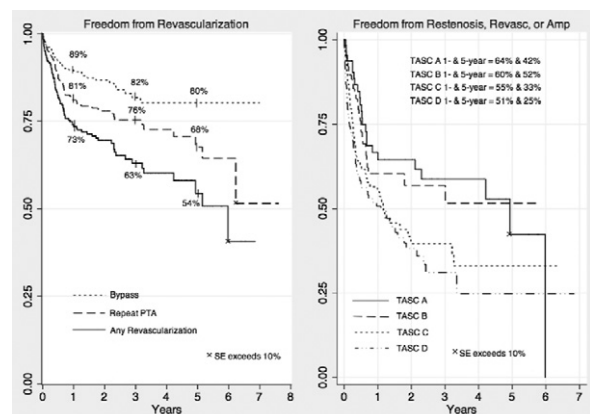


Fig.

Conclusions: Infrapopliteal PTA is effective primary therapy for TASC A and B lesions. Multilevel intervention does adversely affect outcome.