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Vein Mapping Prior to Endovenous Catheter Ablation of Great Saphenous Vein Predicts Risk of Endovenous Heat-Induced Thrombus Formation

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Objectives: The incidence of endovenous heat-induced thrombus (EHIT) and deep vein thrombosis (DVT) after endovenous laser treatment (EVLT) or radiofrequency ablation (VNUS) of truncal vein is low. However, the consequence may be lethal. We investigate the value of vein mapping prior to vein ablation for predicting the risk of thrombus formation.

Methods: 355 consecutive vein mappings were prospectively collected and analyzed. Excluded were 29 patients who did not complete the EVLT or VNUS procedure. All symptomatic patients underwent venous duplex ultrasound to assess for valvular incompetence. Preoperative venous reflux is defined as >0.5 second. Vein mapping of refluxing truncal veins was done at least the day prior and the diameter of the great saphenous vein (GSV) or small saphenous vein (SSV) measured. Post-operative duplex were performed between 5-7 days after the procedure. Bivariate analysis of independent variables by outcomes was performed using Student's t-test for continuous variable, chi-square test for categorical variables, and logistic regression to estimate the odds ratio (OR). Multivariate logistic models were used to adjust for diameter and refluxing vein.

Results: Among the 355 studies in 330 patients, the average age of the patients was 55.2 years; 96 male (29.1%) and 231 female (70.9%); 312 were GSV (95.7%) and 14 SSV (4.3%); 169 right leg (51.4%) and 157 left leg (48.2%). Among 326 veins, 169 were treated with VNUS (51.8%) and 157 EVLT (48.2%). The immediate post-procedure closure was seen in 319 veins (97.9%). Among the 312 GSV ablation procedures, 10 (3.2%) developed EHIT or DVT. When comparing the group of patients who developed EHIT versus no EHIT, the mean GSV diameter was 12.75 ± 5.76 mm versus 8.5 ± 3.44 mm (OR 1.23, $P = .001$), the presence of valvular incompetence at the saphenofemoral junction was 8.33% vs. 0.44% (OR 20.64, $p = .001$), and 3.09% in VNUS vs. 2% in EVLT (OR 0.64, $P = .54$)

Conclusions: Patients with valvular insufficiency of the saphenofemoral junction and a large proximal GSV diameter had significantly higher risk of developing heat-induced thrombus formation after endovenous catheter ablation. There was no difference in the occurrence of EHIT with EVLT or VNUS procedures in our series.

Bovine Pericardial Patch Repair in Infected Fields

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Objectives: Bovine pericardial patches (BPP) are frequently used for arterial reconstruction, but little data exists regarding their ability to resist infection. We hypothesize that BPP would provide a reasonable alternative to autologous vein patches in infected fields.

Methods: We used BPP (Synovius medical) to repair 51 arteriotomies (25 brachial, 23 femoral, 3 popliteal) in 48 consecutive patients (mean age 68, 65% men, 75% diabetic, 67% dialysis dependent) undergoing removal of infected (33 gram positive, 3 gm negative and 8 mixed flora and 4 culture negative) PTFE grafts (35 AV graft, 9 femoral-distal bypass, 4 femoral patch angioplasty), between 1/2007 and 1/2011. Patients were followed retrospectively and outcomes including death, rupture, secondary reconstruction and infection were recorded.

Results: Over a mean follow up of 2.1 years (range 3-48 months) 50 of 51 patches remained in place without evidence of recurrent infection, rupture or revision. One patient had acute rupture of a popliteal arteriotomy 1 week post repair and had subsequent ligation and above knee amputation. Eight of the 48 patients died from unrelated causes during follow up. (3 withdrew from dialysis, 3 MI, 2 unknown)

Conclusions: Bovine pericardial patches provide a durable alternative to saphenous vein for arterial reconstruction following removal of infected arterial grafts.

Aberrant Subclavian Artery: Presentation and Outcomes

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Objectives: Aberrant subclavian artery (ASA) is one of most frequent aortic arch anomalies. Many authors recommend treatment of symptomatic or aneurysmal aberrant subclavian arteries, but most of these recommendations are based on small case series or anecdotal experience. Natural history of this anomaly is not well defined. Our aim was to review long term outcomes in patients with this anomaly.

Methods: A retrospective review of all adult patients seen at Mayo Clinic between 1997 and 2011 with a diagnosis of ASA was performed after approval from our institutional review board. Demographic factors and outcome data was collected and analyzed. All patients were diagnosed based on imaging studies.

Results: There were 446 patients with diagnosis of Asa and mean age at diagnosis was 54.7 years (range 1month- 93 years). There were 102

aberrant left and 344 aberrant right subclavian arteries in 164 male and 284 female patients. There were more female patients than male with right ASA (2:1) versus similar distribution for left ASA (1.25:1). Forty five (10%) patients were symptomatic, the most common symptoms being dysphagia and/or respiratory. These were presumed from compression, although most patients noted to have esophageal compression on radiographic study had no dysphagia. Forty two patients (9.4%) underwent surgical intervention for ASA, all were symptomatic or had aneurysmal degeneration. No patient presented urgently, except one with acute upper extremity ischemia in conjunction with aortic and subclavian dissection and underlying right Asa. Mean follow up duration was 6.3 years (range 0-70 years). None of the patients followed conservatively developed any complications related to the ASA.

Conclusions: Aberrant subclavian artery is a benign anomaly and has no significant long term consequences. Intervention is recommended in symptomatic patients, in whom other causes for symptoms have been ruled out. Multiple surgical options should be tailored patient specific problems.

Autologous Bone Marrow Mononuclear Cell Therapy Produces Durable Benefits in Limb Salvage at Five Years Post-Treatment

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Objectives: We have previously demonstrated that autologous bone marrow mononuclear cell (ABMNC) therapy improves measures of limb perfusion, rest pain, wound healing, and amputation free survival (AFS) at one year in patients with critical limb ischemia (CLI). Long term durability of ABMNC therapy for critical limb ischemia (CLI) remains unknown. The objective of this current study is to evaluate long term clinical outcomes five years after treatment.

Methods: Data were retrospectively gathered from a database and via a survey sent to patients with CLI who had previously underwent intramuscular transplantation of ABMNCs in the most symptomatic limb. AFS, freedom from major amputation, and freedom from major adverse limb events (MALE) were calculated using the product-limit estimate. The incidence of cardiac, malignant and other medical events during the time from treatment to follow-up were tabulated.

Results: Twenty-one of the 24 (87.5%) patients who completed the initial one year Phase I trial responded to a detailed questionnaire Interval from initial treatment was 188.2 ± 12.3 weeks, range:129- 278). At five years AFS was 74% (95% CI, 0.53-0.86; $P < .05$) (Fig 1), freedom from major amputation was 78% (95% CI, 0.57-0.89; $P < .05$) (Fig 2) and freedom from MALE was 65% (95% CI, 0.45- 0.79; $P < .05$) (Fig 3). Three patients (14.2%) had major cardiac events. There were no incidences of malignancies or diagnoses of proliferative retinopathy. Fifteen patients (71.4%) report continued improvement in pain-free walking. Nineteen (90.4%) patients felt that the study was of significant medical value and would participate again.

Conclusions: ABMNC therapy provides long term freedom from AFS, major amputation, and MALE that are comparable to surgical and endovascular interventions for CLI. Furthermore this study eliminates the concerns for tumor genesis and proliferative retinopathy associated with angiogenic therapies.

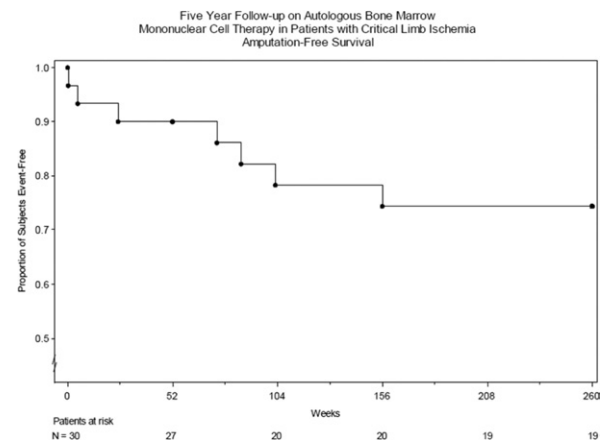


Fig 1.