Abstracts from the 2011 Midwestern Vascular Surgical Society Annual Meeting

Costochondral Calcification, Osteophytic Degeneration, and Occult First Rib Fractures in Patients With Venous Thoracic Outlet Syndrome

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Objectives: Subclavian vein (SCV) compression in venous thoracic outlet syndrome (TOS) has been attributed to various anatomic factors, but a potential role for costochondral degeneration in the underlying first rib has not been previously examined. The purpose of this study was to examine the frequency of costochondral calcification (CC), osteophytic degeneration (OD), and occult first rib fracture (FRFx) in patients with venous TOS.

Methods: During a 12-month period 37 patients with SCV effort thrombosis received surgical treatment of venous TOS. All patients underwent paraclavicular thoracic outlet decompression with complete resection of the first rib. The presence or absence of CC, OD and FRFx was determined by direct visual examination of the rib at operation and following debridement of adherent soft tissues in the excised specimen.

Results: No patient has radiographic first rib abnormalities. FRFx were observed in 16 of 37 patients (43%). All FRFx were small, nondisplaced, linear lesions located within an area of CC in the anterior rib medial to the scalene tubercle. The mean age of patients with FRFx was higher than those with a normal first rib (38.1 ± 1.5 yr vs 25.0 ± 2.3 yr; $P < 0.0001$), and FRFx was present in 16 of 21 (76%) patients 30 years of age but in no patients younger than 30 ($P < 0.0001$).

Conclusions: A high proportion (43%) of patients with venous TOS exhibited CC, OD, and a previously undetected FRFx, including 76% of those over the age of 30. These lesions occur in the cartilaginous anterior rib where they are clinically occult and undetected by standard radiographic imaging. We postulate that age-related CC may predispose to stress-induced OD and FRFx, and that inflammation and anatomic distortion may contribute to SCV compression. Further investigation will be needed to determine the cause(s) and influence of occult FRFx in the development of venous TOS.

Adjunctive Use of the Superficial Femoral Vein for Vascular Reconstructions

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Objectives: While the superficial femoral vein (SFV) is an accepted treatment for aortic graft infections, this conduit also has potential uses in other areas. We evaluate our experience using the SFV for arterial and venous bypasses, and arteriovenous (AV) fistula for dialysis access.

Methods: Between 1999-2011, 42 patients underwent a bypass or a thigh AV fistula using the SFV (31 arterial, 4 central venous, 6 AV fistula, and 1 common carotid-to-vertebral bypass). Indications for arterial bypass included: infected graft (20), critical limb ischemia (9), and failed previous bypass (4). Indications for central venous bypass were: SVC syndrome (2); vessel reconstruction due to tumor encasement (1); and central vein occlusion from thoracic outlet syndrome (1). All AV fistulas were created after patients suffered bilateral subclavian vein occlusions from failed upper extremity access. The common carotid-to-vertebral bypass was created due to an occluded vertebral artery with resultant stroke.

Results: Kaplan Meier cumulative patency curves are shown in the Fig. The primary patency rates at 30 days, 1 and 3 years were 97.4% (95% CI, 92.41,100), 74.6% (95% CI, 57.89,96.23) and 66.4% (95% CI, 47.06,93.53), respectively. The assisted primary patency rates at 30 days, 1, and 3 years were 100% (95% CI, 100,100), 97.1% (95% CI, 91.54,100) and 89% (95% CI, 74.29,100), respectively. Secondary patency rates at 30 days, 1, and 3 years were 100% (95% CI, 100,100), 97.1% (95% CI, 91.54,100) and 89% (95% CI, 74.29,100), respectively. Limb salvage rates at 30 days, 1, and 3 years were 97.3% (95% CI, 92.21,100), 89.3% (95% CI, 78.35,100), and 89.3% (95% CI, 78.35,100), respectively. Survival rates at 30 days, 1, and 3 years were 97.6% (95% CI, 92.95,100), 86% (95% CI, 75.3,98.3), and 86% (95% CI, 75.3,98.3), respectively. Follow-up ranged from 1 month to 8.7 years (mean time, 21 months). Complications occurred in 22 patients (52%) and included: wound complications (n = 19, 45.2%); deep vein thrombosis (n = 1, 2.4%); anastomotic breakdown (n = 1, 2.4%); hematoma (n = 5, 11.9%); pulmonary embolism (n = 2, 4.8%); and compartment syndrome (n = 2, 4.8%).

Conclusions: The SFV is a durable conduit for uses beyond aortic reconstruction and should be considered when the GSV is not available, or size match is a concern. However, wound complications remain a problem.

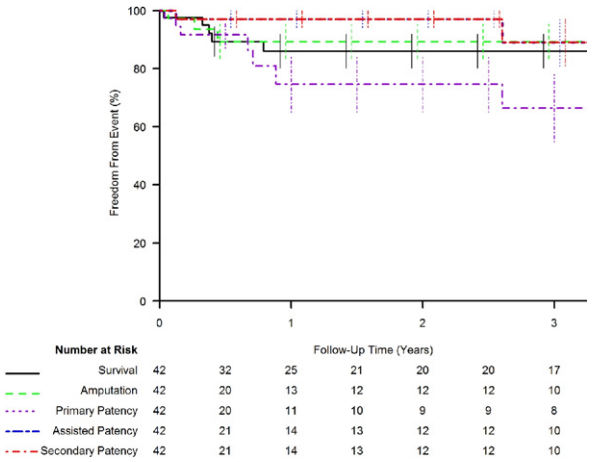

Fig.

Endovascular Repair of Abdominal Aortic Aneurysm Does Not Improve Survival versus Open Repair in Patients Sixty Years or Younger

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Objectives: Multiple randomized trials have demonstrated lower postoperative morbidity and mortality after endovascular repair (EVAR) compared to open repair (OAR) for infrarenal abdominal aortic aneurysms (AAA). This advantage for EVAR has, however, been mostly in relatively older patients with no study specifically comparing EVAR and OAR for patients 60 years or younger.

Methods: We compared the 30-day mortality outcomes of EVAR and OAR for elective infrarenal AAA repair in patients 60 years of age or younger who were identified from the 2007-09 National Surgical Quality Improvement Program - a multicenter (more than 180 hospitals), prospective database. The 30-day mortality rate from the NSQIP analysis was then combined with the 30-day to 2-year aneurysm-related mortality rate after AAA repair from the OVER trial (0.9% for EVAR and 0% for OAR) to determine the 2-year aneurysm-related mortality rate for EVAR and OAR.

Results: Of the 651 patients, 369 (56.7%) underwent EVAR and 282 (43.3%) underwent OAR. Patients undergoing EVAR were more commonly males (90.8% vs 80.5%; $P = .0002$) and dialysis dependent (3.0% vs. 0.4%; $P = .01$). There were no differences between the two groups in terms of diabetes, functional status, COPD, heart failure, myocardial infarction, peripheral arterial disease, and ASA class ($P > .05$). Thirty-day mortality for EVAR and OAR were 1.1% and 0.4%, respectively ($P = .22$). If the 30-day mortality rate from our NSQIP analysis is combined with the 30-day to 2-year aneurysm-related mortality rate after AAA repair from the OVER trial, the 2-year aneurysm-related mortality rate for EVAR and OAR are 2% and 0.4%, respectively.

Conclusions: The two-year peri-procedural and aneurysm-related mortality rate after OAR is similar to, if not lower than EVAR in patients 60 years or younger with infrarenal AAA. This calls for a randomized prospective trial comparing OAR and EVAR in these patients.

Estimating the Risk of Radiation Associated Malignancy in Patients Undergoing Routine Computed Tomography for Surveillance of Aortic Endografts Using BEIR VII Model: Is It Time to Redefine the Follow-up Protocol

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Objectives: Patients undergoing endovascular repair of abdominal aortic aneurysms (EVAR) are routinely subjected to CT Angiography (CTA)