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Comment: The data once again emphasized that AKI following endovascular aortic repair is an infrequent but morbid complication. For both open and endovascular repair of the abdominal and thoracic aorta, acute kidney injury portends a worse short and long-term outcome even if the patient does not become dialysis dependent.

Safety and Efficacy of a Potential Treatment Algorithm by Using Manual Compression Repair and Ultrasound-Guided Thrombin Injection for the Management of Iatrogenic Femoral Artery Pseudoaneurysm in a Large Patient Cohort

Dzijan-Horn M, Langwieser N, Groha P, et al. Circ Cardiovasc Interv 2014;7:207-15.

Conclusions: A treatment algorithm incorporating both manual compression repair and ultrasound-guided thrombin injection for management of iatrogenic femoral artery pseudoaneurysm is both efficacious and safe.

Summary: When comparing ultrasound-guided manual compression (USGC) and ultrasound-guided thrombin injection (UGTI), success of USGC ranges between 71% and 99% but has disadvantages that include less effectiveness in patients receiving anticoagulation, potentially long procedure times, and both patient and operator discomfort during compression. UGTI has higher success rates between 91% and 100% with a low complication rate, but is an off-label use of thrombin. The authors developed at their institution in 2007 a treatment algorithm based on morphologic properties of the pseudoaneurysm that they used to guide the use of USGC or UGTI. In this paper they evaluate the safety and effectiveness of their algorithm. The algorithm begins with ultrasound imaging of the pseudoaneurysm. Pseudoaneurysms without a clearly definable neck and those directly adjacent to vessels and pseudoaneurysms with a concomitant arteriovenous fistula were initially referred to USGC. Others were treated with UGTI. Anticoagulation therapy was not halted routinely before treatment and distal pulses were monitored before and after pseudoaneurysm treatment. Between January 2007 and January 2011 a total of 432 pseudoaneurysms were diagnosed in 29,091 consecutive patients, (1.49%) of those patients undergoing femoral artery catheterization. Closure devices were not used. Based on the treatment algorithm there were 145 pseudoaneurysms treated with USGC (34%) and 287 (66%) treated with UTGI. Follow-up duplex scans were performed within 12 to 14 hours after USGC only and within 4 to 6 hours after UGTI or by the next morning and were available for 428 patients (99.1%). The overall success rate of the institutional algorithm was 97.2% which was achieved by 178 manual compressions treatments and 357 UGTI procedures, respectively. There were procedural complications in five cases (1.4%) after UGTI and three cases (1.7%) after USGC. The treatment algorithm was not successful in 12 patients; two pseudoaneurysms (0.5%) were subsequently successfully excluded by implantation of a covered stent, and 10 patients required surgical intervention (2.3%) which was associated with a complication rate of 30%.

Comment: Both USGC and UGTI are now standard therapies for femoral artery iatrogenic pseudoaneurysm. UGTI is preferred by most as it is quicker, probably more effective, and involves less patient and operator discomfort. The most feared complication of UGTI is interarterial injection of the thrombin or extension of the clot in the pseudoaneurym into the femoral artery. The author's treatment algorithm seeks to minimize these potential complications. Three patients in this study treated with UGTI had interarterial thromboembolism, two of which were successfully treated with heparin only and the third required embolectomy from the popliteal artery. The author's treatment algorithm was associated with an overall high success and low complication rate. It is likely however in most practices USGC will be used less than described here. The author's treatment algorithm is, after all, to a great extent arbitrary. A more aggressive approach with the use of UGTI may be possible with similar complication rates.

Thirty-Year Mortality After Venous Thromboembolism: A Population-Based Cohort Study

Søgaard KK, Schmidt M, Pedersen L, et al. Circulation 2014;130:829-36.

Conclusions: Patients with Venous Thromboembolism (VTE) are at increased risk of dying, especially within the first year after diagnosis. This risk however continues after 30 years of follow-up and VTE in these patients remains an important late cause of death.

Summary: Short-term mortality from VTE has been well studied, however the magnitude of long-term mortality after VTE is found to vary substantially between studies. One study reported an 8 year mortality risk of 12% (Flinterman LE et al, PLoS Med 2012; 9:e1001155). An earlier study demonstrated a mortality risk that reached 50% after 8 years of follow-up (Heit JA et al, Arch Intern Med 1999; 159:445-53). These studies were, however, of restricted populations and had essentially little information of long-term mortality comparisons between VTE patients and a comparison cohort from the general population. One other study has reported a 40% higher mortality in VTE after 10 years compared with the expected mortality in the general population (Schulman S et al, J Thromb Haemost 2006; 4:734-42). The authors therefore undertook a nationwide population based cohort study to examine 30-year VTE mortality with respect to VTE subtypes, calendar periods of diagnosis and underlying comorbidity. They used Danish medical databases with a total of 128,223 patients with first time VTE (1980-2011) and a comparison cohort of 640,760 people from the general population, matched by sex, year of birth, calendar period and without VTE for comparison. Mortality risk for patients with deep venous thrombosis (DVT) and pulmonary embolism (PE) were markedly higher than the comparison cohort during the first year, especially within the first 30 days (3.0% and 31% vs 0.4%). Using Cox regression, mortality rate ratios with 95% confidence intervals were estimated. The overall 30-year mortality rate ratio (MRR) was 1.55 (95% confidence interval [CI], 1.53-1.57) for DVT and 2.77 (95% CI, 2.74-2.81) for PE. Thirty-day MRR was 5.38 (95% CI, 5.00-5.80) for DVT and 80.87 (95% CI, 76.02-86.02) for PE. Over time, the 30-day MRR was consistently 5 to 6 fold increased for DVT whereas it improved for PE from 138 (95% CI, 125-153) in 1980-1989 to 36.08 (95% CI, 32.65-39.87) in 2000-2011. The 1- to 10-year and 11- to 30-year MRRs remained 25% to 40% increased after both DVT and PE but were 3 to 5 fold increased after DVT and 6 to 11 fold increased after PE when VTE was considered the immediate cause of death.

Comment: This is fascinating data on the long-term mortality risk of VTE. Vascular surgeons evaluating the effect of long-term VTE have traditionally focused on the development of chronic venous insufficiency. However like intermittent claudication the risk to the extremity in a patient with VTE may be dwarfed by the risk to life. The study points out that it is important to focus on optimizing treatment of VTE in reducing risk factors for VTE reoccurrence to potentially improve patient mortality over time and to prevent long-term VTE related death.

Silent Cerebral Ischemia After Thoracic Endovascular Aortic Repair: A Neuroimaging Study

Kahlert P, Eggebrecht H, Jánosi RA, et al. Ann Thorac Surg 2014;98:53-8.

Conclusions: Thoracic endovascular aortic repair (TEVAR) results in high incidence of new foci of restricted diffusion on cerebral DW-MRI with a pattern of diffusion deficits suggesting periprocedural embolization.

Summary: Periprocedural stroke after TEVAR is thought to be related to emboli which are dislodged during manipulation of guidewires, catheters, and delivery devices in a diseased aortic arch. It is possible, however, that in addition to clinically apparent disabling neurologic deficits, manipulations may also result in clinically silent cerebral embolization. These silent emboli may be associated with more lingering neurologic impairment and result in decline of cognitive function and worsening of dementia during long-term follow-up (Bendszus M et al, Lancet Neurol 2006; 5:364-72). The authors sought to determine the incidence of clinically silent cerebral embolism after TEVAR, postulating that the rate of clinically silent cerebral ischemia may be higher than that of the clinically evident cerebral ischemia rates of 2% to 6%. In this study19 patients (13 males and six females) who underwent TEVAR were included into a descriptive study. Periprocedural apparent and silent cerebral ischemia were assessed by daily clinical neurologic assessment and serial cerebral diffusion-weighted magnetic resonance imaging (DW-MRI) at baseline and 5 days (median interquartile range, 3.5) after the procedure. TEVAR was successful in all patients without immediately clinically, apparent neurologic deficits. Post interventional cerebral DW-MRI detected a total of 29 new foci of restricted diffusion in 12 of 19 TEVAR patients (63%). Lesions were usually multiple (1 to 6 lesions per patient) and ranged in size between 15 mm^3 to 300 mm^3; 16 lesions were found in the left hemisphere, 13 lesions in the right hemisphere. Covering the left subclavian artery was performed in eight cases, but was not associated with lateralization of lesions. There were no additional apparent neurologic events during the in-hospital period.

Comment: Clearly, it is not optimal to be scraping catheters, guidewires and sheaths around in the aortic arch. The long-term effects of cerebral micro emboli occurring after all types of vascular procedures, including coronary artery bypass, aortic arch repair, carotid endarterectomy, carotid artery stenting and now TEVAR still remain to be determined. Nevertheless, one has to agree that the DWI lesions seen in this study cannot possibly be good things.