Abstracts

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Association Between Surgical Care Improvement Program Venous Thromboembolism Measures and Postoperative Events

Altom LK, Deierhoi RJ, Grams J, et al. Am J Surg 2012;204:591-7.

Conclusion: There is no association between rates of venous thromboembolism (VTE) and adherence to the Surgical Care Improvement Program (SCIP) implemented measures to reduce VTE.

Summary: SCIP was implemented by the Centers for Medicare and Medicaid Services (CMS) in 2006. The goal of SCIP is to reduce surgical complications, surgical site infections, adverse cardiac events, and thromboembolism by 25%. SCIP is a core measure collected by the Joint Commission. In-hospital adherence to SCIP measures is reported publicly. Deep venous thrombosis and pulmonary embolism are known to be potentially significant causes of postoperative morbidity and mortality. SCIP introduced two VTE prophylactic measures for surgical procedures as reflected in guidelines from the American College of Chest Physicians. SCIP-VTE-1 measures whether VTE prophylaxis was ordered, and SCIP-VTE-2 measures whether prophylaxis was received; both ≤24 hours of surgery. This study sought to determine the rates of adherence to SCIP-VTE guidelines, to identify factors for nonadherence, and to analyze relationships between SCIP guideline adherence and VTE events in the context of other patient and procedure factors. This was a retrospective cohort study of data from the VA Surgical Quality Improvement Program from 2006 to 2009. There were 30,531 surgeries analyzed. Patient demographics, comorbidities, and surgical characteristics associated with VTE were summarized. VTE rates were compared by SCIP-VTE adherence. VTE was modeled by adherence to SCIP and adjusting for multiple associated factors using multivariable logistic regression. Of the 30,531 surgeries evaluated, 89.9% adhered to SCIP-VTE, and 1.4% experienced VTE. Obesity, smoking, functional status, weight loss, emergency status, age >64 years, and surgical time were identified by logistic regression to be associated with VTE. SCIP-VTE adherence was not associated with VTE (1.4% vs 1.33%; $P = .3$). The lack of association of SCIP-VTE with VTE remained even after adjustment for compounding variables.

Comment: Most prior analyses of SCIP measures have focused on surgical site infection. These analyses have not provided convincing evidence that adherence to SCIP surgical site infection measures reduces the rate of surgical site infections. Similarly, this study suggests compliance with SCIP-VTE prevention measures has no measurable association with events that are intended to be prevented by adherence to the SCIP-VTE measures. SCIP-VTE measures may be ineffective or too limited to compensate for the large variation and complexity of patient and surgical factors contributing to VTE. No one will argue that reduction of surgical associated VTE is a desirable goal. However, the SCIP regulations should be considered for elimination or modification if they are not found to produce their intended results.

Renal Sympathetic Denervation for Treatment of Drug-Resistant Hypertension: One-Year Results From the Symplicity HTN-2 Randomized Controlled Trial

Esler MD, Krum H, Schlaich M, and the Symplicity HTN-2 Investigators. Circulation 2012;126:2976-82.

Conclusion: Renal denervation provides safe and sustained reduction of blood pressure to 1 year.

Summary: The number of adults with hypertension is expected to grow to >1.5 billion worldwide by 2025 (Kearney PM et al, Lancet 2005;365:217-23). There is a subset of patients with particularly difficult to control hypertension who, despite adherence to three or more drugs, continue to have uncontrolled or resistant hypertension (Mahfoud F et al, Deutsches Arzteblatt Internation 2011;108:725-31). Resistant hypertension prevalence in the United States ranges from 13% to 30% (Persell SD et al, Hypertension 2011;57:1076-80). There is activation of the renal sympathetic system in patients with essential hypertension. Efferent sympathetic outflow to the kidneys results in elevation of blood pressure via release of renin. In addition, afferent nerve signaling from the kidneys with renal injury also stimulates sympathetic outflow from the central nervous system. There have been preclinical studies of renal denervation in animal models of hypertension that provide direct evidence of blood pressure lowering through renal denervation. This suggests a significant role of the sympathetic nervous system of the kidney in the pathogenesis of hypertension (DiBona GF et al, Physiol Rev 1997;77:75-197). Renal denervation can be accomplished with the application of radiofrequency energy in short bursts along the length of the main renal arteries. The result is ablation of renal nerves that lay within and just beyond the adventitial tissue of the renal arteries. The Symplicity HTN-1 Trial, along with a registry of patients with resistant hypertension treated by renal denervation, have demonstrated reductions in office-based blood pressure, apparently without serious adverse events (Investigators Symplicity HTN-1, Hypertension 2011;57:911-7). Symplicity HTN-2 is a multicenter randomized trial that previously demonstrated catheter-based renal denervation provided significant lowering of blood pressure in treatment-resistant patients at 6 months after the procedure compared with control, medication-only patients. In this report, the authors present longer follow-up and include 6-month crossover results of Symplicity HTN-2. Eligible patients were taking three or more antihypertensive medicines and had a baseline systolic blood pressure ≥160 mm Hg (≥150 mm Hg for type 2 diabetic patients). After the 6-month end points were met, renal denervation was permitted in control patients. Here the authors present 1-year results of 47 patients randomized to immediate renal denervation and 6-month postprocedure results for crossover patients. At 12 months after the procedure, the mean fall in office systolic blood pressure in the initial renal denervation group (−28.1 mm Hg; 95% confidence interval, −35.4 to 20.7; $P < .001$) was similar to the 6-month fall (−31.7 mm Hg; 95% confidence interval, −38 to −25.0; $P = .16$ compared to the fall at 6 months). The mean systolic blood pressure of the crossover group 6 months after the procedure was significantly lower, from 190 ± 19.6 to 166.3 ± 24.7 mm Hg (change, −23.7 ± 27.5; $P < .001$). There was one renal artery dissection associated with guide catheter insertion in the crossover group and one hypotensive episode that resolved with medication adjustment.

Comment: The mechanisms of essential hypertension are slowly being unraveled. It appears renal sympathetic nerve activation has a role in the production of essential hypertension and that denervation of the kidney, with catheter based techniques, has the potential to interrupt renal afferent and efferent nerves, resulting in decreased sympathetic outflow to the kidneys, reduced renin release, decreased sodium retention, increased renal blood flow, and lower blood pressure. Thus far, there has not been animal or clinical evidence that use of the Simplicity catheter to denervate the kidneys results in sustained damage to the renal arteries. There has also been no documentation of adverse effects on renal function at 6 and 12 months after renal denervation. Renal denervation appears to have the potential to provide safe and effective adjunctive treatment for drug-resistant hypertensive patients.

Usefulness of Aspiration of Pulmonary Emboli and Prolonged Local Thrombolysis to Treat Pulmonary Embolism

Cuculi F, Kobza R, Bergner M, et al. Am J Cardiol 2012;110:1841-5.

Conclusion: In patients with pulmonary embolism (PE), manual aspiration and application of prolonged thrombolysis is feasible and safe, with significant improvement in pulmonary artery pressures.

Summary: A catheter-based intervention for significant PE can be an alternative to systemic thrombolysis or surgical embolectomy. There are multiple catheter-based techniques that can be used in the treatment of PE, including thrombus fragmentation, rheolytic thrombectomy, suction thrombectomy, and rotational thrombectomy. In this report, the authors describe a new pharmacomechanical approach to catheter-based treatment of PE using prolonged infusion of urokinase directly into the pulmonary arteries. Manual aspiration of thrombus using guide catheters was followed by introduction of thrombolysis catheters and a local bolus of urokinase. Lysis catheters were left in place and repeat pulmonary artery angiography and right-side cardiac catheterization performed 3 days later. Sixty-three patients with a mean age of 60 ± 15 years were treated over 8 years. The PE was massive in 17 patients (27%) and submassive in 46 (73%). Mean pulmonary artery (PA) pressure was 35 ± 10 mm Hg, and 54% had central bilateral PE. Five patients died, one before, one during, and three after intervention. Nine patients (14%) had major bleeding episodes. Bleeding was not responsible for any fatal outcome. After 3.3 ± 1.0 days, 49 of 58