

Matthew S. Johnson, MD, Indianapolis, IN

Traumatic arterial injuries, which affect thousands of people annually in the United States, represent a significant therapeutic challenge.<sup>1</sup> Mortality ranges from 3 to 48%, depending on the location of the injury and the severity of associated injuries, which are common.<sup>2-4</sup> In some instances, such as internal iliac arterial branch injury in pelvic trauma or hepatic arterial branch injury in abdominal trauma, percutaneous embolic occlusion of the injured nonessential vessel may be curative.<sup>5,6</sup> Such an approach would be inappropriate, however, in the treatment of major arteries and veins, which historically have been treated surgically.<sup>1</sup> Covered stents, also known as endografts or stent grafts, potentially offer an alternative, less invasive treatment mode for traumatic injuries to essential vessels. Endovascularly placed stent grafts may exclude the injured segment, thus simultaneously providing hemostasis and maintaining vessel patency. This approach is especially attractive in areas that are less accessible to the surgeon, such as those in the pelvis or chest. Multiple articles describing the successful treatment of peripheral vascular trauma using endografts have been published.<sup>7-13</sup>

The use of the WALLGRAFT endoprosthesis stent graft (Boston Scientific, Natick, MA) for the exclusion of injured peripheral arteries was evaluated in a multicenter trial. A total of 62 patients with traumatic injuries (perforations) of the iliac, femoral, popliteal, subclavian, and axillary arteries were treated. In the pivotal trial (evaluation of utility in trauma and in exclusion of aneurysm), 24 patients received the WALLGRAFT; 38 patients were treated under a compassionate-use protocol. Exclusion and patency of the WALLGRAFT were assessed by duplex ultrasonography, computed tomography (CT), arteriography, or magnetic resonance angiography immediately post-procedure and at 6 and 12 months. Complications were noted at each follow-up visit. In addition, freedom from bypass and freedom from target lesion revascularization were assessed.

This presentation will focus on two case studies that are indicative of the type of trauma cases encountered and outcomes that may be obtained in very challenging injuries.

Patient CB, enrolled in the pivotal trauma arm, is a 43-year-old female involved in a motorcycle accident. She sustained fractures to the left scapula, clavicle, and first rib and was found to have a left subclavian artery laceration opposite the origin of the internal mammary artery. The patient was hemodynamically unstable as a result of this laceration. Given the clinical situation, endoluminal treatment was deemed the best option. Hemostasis was successfully achieved with placement of a 10 × 20 mm WALLGRAFT. The patient made a full recovery. Exclusion has been maintained and confirmed at 3 months (duplex scan), 6 months, and 12 months (contrast-enhanced CT).

Patient SJS was a 77-year-old male with a history of congestive heart failure, hypertension, renal disease, and chronic obstructive pulmonary disease. He sustained a perforation of the left subclavian artery during large-bore subclavian vein catheter placement. The perforation was successfully sealed following the placement of two 9 × 20 mm WALLGRAFTs. The patient recovered fully from the perforation but remained hospitalized for a period of 18 days owing to other comorbidities. Patency and exclusion were confirmed at the 6-month follow-up visit via a contrast-enhanced CT scan. No device or procedure-related adverse events occurred during the follow-up. The patient died just prior to his 1-year follow-up (343 days) owing to a retroperitoneal hemorrhage, aspiration pneumonia, and end-stage renal failure.

Endovascular management of traumatic arterial injuries can be performed rapidly and often with less morbidity and mortality than with surgical options. This is particularly true when the injured vessel is difficult to access and the patient has other associated traumatic injuries. Therefore, stent graft placement could reasonably be considered as first-line therapy in selected patients with arterial injury.

#### References

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## NOTES