A Novel Hybrid Arch Stent Graft for Open Repair of Acute DeBakey Type I Dissection in Patients with Malperfusion: the PERSEVERE US IDE Study

Objective
A novel hybrid arch stent graft was developed for patients with DeBakey I aortic dissection and end organ malperfusion but without frank arch pathology. This case video demonstrates the implantation of this investigational device.

Case Video Summary
A 45-year-old male with hypertension presented to an outside hospital with acute onset chest pain radiating to his back. On exam, he had absence of a right femoral pulse and lacked sensation from the mid-thigh distally. CT angiography diagnosed a Debakey I, acute type A aortic dissection with a clear entry tear above the sinotubular junction, free rupture into the right pulmonary artery, dissection of the innominate artery with reduced flow in the right carotid, and occluded right common iliac. The patient was transferred directly to our operating room. Filmed from the head of the bed and the assistant surgeon's perspective, this video details the step-by-step implantation of this novel stent graft. The device, comprised of an uncovered nitinol wire braided stent with a proximal felt cuff, is deployed in an antegrade fashion during circulatory arrest with its distal portion extending into the descending thoracic aorta and its proximal component landing in the distal ascending aorta. Following deployment, the felt cuff of the proximal device is incorporated into the distal ascending anastomosis to prevent new entry tears. Inside the arch and descending thoracic aorta, the bare metal stent stabilizes the true lumen and induces aortic remodeling over time. Due to the extent of this patient's dissection, a bioprosthetic root replacement was also performed. The patient had an uneventful postoperative course and was discharged home on postoperative day 6. At 30-day follow-up, surveillance CT angiography demonstrated an intact proximal repair, remodeling of the innominate artery with dramatically increased flow in the right common carotid artery, near complete expansion of the true lumen throughout the course of the stent graft, and restored flow through the entire right iliofemoral system.

Conclusions
This case video shows a DeBakey I, acute type A aortic dissection with multiple sites of end-organ malperfusion successfully treated with an investigational hybrid bare metal arch stent in conjunction with a root replacement and hemiarch reconstruction.

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