Three-vessel fenestrated repair of 6-cm thoracoabdominal aortic aneurysm repair after chronic type B dissection

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Mohammad Alqaim, MD, Tammy Nguyen, MD, MPH, Jessica P. Simons, MD, MPH, *and* Andres Schanzer, MD on behalf of the UMass Memorial Center for Complex Aortic Disease *Worcester, Mass*

Experience with fenestrated endovascular aortic endograft (FEVAR) in the treatment of post-dissection aneurysms remains challenging. A 49-year-old man with a history of type A dissection repair (ascending tube graft) presented with a residual 6-cm expanding extent III thoracoabdominal aortic aneurysm. Our objective was to perform three-vessel FEVAR with a custom-made endograft with preloaded wires for each fenestration (Video). A serial deployment technique was used. This technique allowed us to cannulate each target artery from above, keeping the remainder of the fenestrated endograft below each fenestration still in the sheath. Keeping the endograft constrained created space outside the endograft, which was key to facilitating catheter and wire mobility and subsequent target artery cannulation.

A custom-made fenestrated endovascular aortic endograft was designed according to the measurements obtained from high-resolution computed tomography angiography images on a three-dimensional workstation using standard centerline flow orthogonal techniques (TeraRecon, Foster City, Calif). The graft design included fenestrations to the celiac artery, superior mesenteric artery, and right renal artery. The main body fenestrated graft was designed with a modified preloaded delivery system and a single diameter reduction tie. Intraoperative three-dimensional–three-dimensional fusion imaging was performed. We used intravascular ultrasound to confirm the true lumen presence. Proximal and distal seals were obtained in nondissected vessels proximal and distal to the dissection. The main body fenestrated graft was delivered via the groin using a serial deployment technique. Cannulation of all target arteries was performed without the use of any reentry device or needle puncture of the septum. Balloon-expandable bridging stent grafts were deployed through the fenestrations to the celiac, superior mesenteric, and right renal arteries. Completion angiography showed expansion of the true lumen and patent visceral branches. The 1-month surveillance imaging study demonstrated excellent stent graft architecture, no evidence of an endoleak, and favorable aortic remodeling.

FEVAR is a feasible option for patients with chronic type B aortic dissection with a thoracoabdominal aortic aneurysm. Serial deployment, by keeping the endograft constrained, creates space outside the endograft, which facilitates target artery cannulation in the narrowed true lumen.

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From the Division of Vascular and Endovascular Surgery, University of Massachusetts Medical School.

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Correspondence: Mohammad Alqaim, MD, Division of Vascular and Endovascular Surgery, University of Massachusetts Medical School, 55 Lake Ave North, Worcester, MA 01655 (e-mail: alqaimmohammad@gmail.com).

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APPENDIX (ONLINE ONLY).

Video 1 Three-vessel fenestrated repair of 6-cm thoracoabdominal aortic aneurysm (*TAAA*) repair after chronic type B dissection. *3D,* Three-dimensional; *CIA,* common iliac artery; *CKD,* chronic kidney disease; *CONTRA,* contralateral; *CSF,* cerebrospinal fluid; *CT,* computed tomography; *CTA,* computed tomography angiography; *HLD,* hyperlipidemia; *HTN,* hypertension; *IPSI,* ipsilateral; *IVUS,* intravascular ultrasound; *R,* right; *RRA,* right renal artery; *SMA,* superior mesenteric artery; *TBAD,* type B aortic dissection; *TEVAR,* thoracic endovascular aortic repair.