Transcatheter Electrosurgical Aortic Septostomy to Facilitate Distal Landing Zone for Thoracic Endovascular Aortic Repair in Chronic Type B Aortic Dissection

Objective: Efficacy of thoracic endovascular aortic repair (TEVAR) for chronic Type B aortic dissection (CTBAD) is dependent upon eliminating retrograde false lumen perfusion and remodeling the aorta. We describe the efficacy of a novel transcatheter electrosurgical technique to fenestrate the dissection flap and create a distal seal zone for TEVAR in CTBAD.

Methods: A retrospective review of the Emory Aortic Database from 2016-2023 identified 33 patients who underwent TEVAR with intentional endovascular rupture of the dissection flap (Knickerbocker) for CTBAD. In eleven patients, we performed transcatheter electrosurgical aortic septostomy (TECSAS) prior to Knickerbocker. The technical aspects of TECSAS+Knickerbocker are described, and results compared to TEVAR + Knickerbocker alone (Figure).

Results: Dissection chronicity, aortic size, and preoperative demographics were similar between groups. Technical success was 100%, with zero stroke, or paraplegia in both groups. 30-day mortality for TECSAS vs. Knickerbocker was 0% vs. 13.6% (p=0.199). Median follow-up was shorter after TECSAS vs. Knickerbocker, though not statistically significant (14.6 months vs. 21.9 months, p=0.065). Elimination of retrograde false lumen perfusion (TECSAS 100% vs Knickerbocker 68.2%, p=0.035), and complete false lumen thrombosis or obliteration (TECSAS 91.9% vs Knickerbocker 54.6%, p=0.037) were more frequent after the TECSAS procedure. Aortic reinterventions were less frequent after TECSAS vs. Knickerbocker (0% vs. 13.6%, p=0.199), though not statistically significant.

Conclusions: The addition of TECSAS to intentional endovascular rupture of the dissection flap in CTBAD improves distal seal, eliminating retrograde false lumen perfusion. This technique has wide applicability, and several advantages over other techniques to optimize TEVAR in CTBAD.

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