Aneurysm sac shrinkage at 1 year after fenestrated-branched endovascular aortic repair of complex aortic aneurysms offers mid-term survival advantage

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Objective:

Investigate the impact of 1-year changes in aneurysm sac diameter on patient survival after fenestrated-branched endovascular aortic repair (FB-EVAR) of complex abdominal aortic aneurysms or thoracoabdominal aortic aneurysms.

Methods:

Clinical data of patients enrolled in a prospective nonrandomized study investigating FB-EVAR (2013-2022) was analyzed. Patients with baseline and 6 to 18-month follow-up CT scans were included. Sac diameter change was defined as the difference in maximum aortic diameter on the centerline of flow, classifying patients as having sac shrinkage (≥5-mm) or failure to regress (<5-mm or expansion). Primary end point was all-cause mortality. Secondary end points were aortic-related mortality (ARM), aortic aneurysm rupture (AAR), and aorta-related secondary intervention.

Results:

There were 549 patients treated by FB-EVAR. Of these, 463 patients (71% male, mean age, 74 ± 8-years) with thoracoabdominal aortic aneurysms (71%) and abdominal aortic aneurysms (29%) were investigated. Sac shrinkage occurred in 270 patients (58%) and failure to regress in 193 patients (42%), including 19 patients (4%) with sac expansion at 1 year. The 5-year survival estimate was 69% ± 4.1% for the sac shrinkage group and 46% ± 6.2% for the failure to regress group. Survival estimates adjusted for confounders revealed a higher hazard of late mortality in patients with failure to regress (adjusted hazard ratio, 1.72; 95% confidence interval, 1.18-2.52; P = .005). The 5-year cumulative incidences of ARM (1.1% vs 3.1%; P = .30), AAR (0.6% vs 2.6%; P = .20), and aorta-related secondary intervention (17.0% ± 2.8% vs 19.0% ± 3.8%) were both comparable between the groups.

Conclusion:

Aneurysm sac shrinkage at 1-year is common after FB-EVAR and is associated with improved patient survival, whereas sac enlargement affects only a minority of patients. The low incidences of ARM and AAR indicate that failure to regress may serve as a surrogate marker for non-aortic-related death.