Repair of Infrarenal Aortic Aneurysms Using Zenith Stent Graft: Midterm Results

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Purpose

The purpose of this study was to examine the results of infrarenal aortic aneurysms using the Zenith (Cook Inc., Bloomington, IN) stent graft system.

Methods

All patients undergoing repair of infrarenal aortic aneurysms using the Zenith system in one center were prospectively studied. Comprehensive information relating to demographics, preoperative assessment, operative technical details, and the course of hospital stay including mortality, morbidity, and secondary interventions was collected. Follow-up included abdominal radiography (before discharge and annually thereafter), computed tomography (CT) (1 month and annually thereafter), laboratory tests, and clinical examination to evaluate renal function, endoleak, migration, structural deterioration of stent graft, and changes in aneurysm morphology. A change in aneurysm diameter of at least 5 mm was considered significant. In addition to the examination of the CT images by physicians for clinical purposes, all the images were further scrutinized by a single observer on a workstation for a methodic review.

Patients treated within 1 year at the time of analysis were excluded. Kaplan-Meier analysis was conducted for adverse events. Separate analyses were conducted for patients undergoing elective surgery and emergency surgery.

Results

An elective repair was undertaken in 161 patients of a median age of 74 years (range 53 to 87). The aneurysm diameter was between 5 and 5.5 cm in 46 and was larger than 5.5 cm in the remaining. Stent-graft configuration was aortouniiliac in 14 and bifurcated in the rest. Adverse events within 30 days included death (2) and secondary intervention (4). Conversion to open repair was not required in any patient.

During a maximum follow-up of 6 years (median 2 years), all-cause mortality was recorded in 37, late conversion in 1, secondary intervention in 31, and migration in 6 patients. Shrinkage of aneurysm was recorded in 60% of the patients and an enlargement in 5.6%. There was no significant change in the aneurysm diameter in 25% of the cohort. A type 1A endoleak was detected at 1 year in one patient and a type 1B endoleak in another patient at 4 years. Five patients were diagnosed to have a type 2 endoleak (2 at 1 month, 2 at 1 year, and 1 at 3 years). The prevalence of type 2 endoleak was as follows: 10% at 1 month and at 1 year, 8% at 2 years, 9% at 3 years, 6% at 4 years, and nil at 5 and 6 years.

An additional cohort of 115 patients underwent an emergency repair. Indications were as follows: rupture confirmed on preoperative CT (53 patients), symptomatic aneurysm without a proven rupture (60), and large asymptomatic aneurysm (2). A bifurcated configuration was used in 86, aorto-uni-iliac in 26 and tubular in 2. Adverse events within 30 days included death in 20 (17%), conversion in 2, and secondary intervention in 7.

Maximum follow-up duration was 6 years (median 2 years), during which a secondary intervention was noted in 13, late conversion in one, type 1A endoleak in 5 (1 at 1 year, 2 at 2 years, and 2 at 3 years) and type 1B endoleak in 1 (at 1 month). Migration or type III endoleak were observed in none. Aneurysm shrinkage was noted in half of the cohort and enlargement in 6%. It was not possible to establish size changes owing to a lack of recording of the aneurysm size at presentation in 31% of the patients.

Conclusions

The early results of aneurysm repair using the Zenith system are characterized by acceptable rates of mortality and morbidity in both elective and emergency situations. Aorto-uni-iliac configuration was used more frequently in the emergency situation for an expeditious repair. The incidence of late complications appears favorable compared to historical experience with endovascular repair in general. A follow-up protocol of annual imaging appears safe.