TEVAR performed in 106 year old female; advantage of low profile Zenith Alpha thoracic endovascular graft

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Disclosure

Speaker name: Naoki Fujimura

I have the following potential conflicts of interest to report:

- Consulting: W.L.Gore, Cook Medical, Endologix
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest
Aging society

Japan’s Rapidly Changing Population Pyramid

Impact of age and urgency on survival after thoracic endovascular aortic repair

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Objectives: Elderly patients are often turned down from receiving treatment for descending thoracic aortic diseases (DTEADs) because of the uncertain benefitsт, especially in acute settings. This study investigated the impact of old age and timing of thoracic endovascular aortic repair (TEVAR) on outcomes of DTEAD in patients older than 75 years of age.

Methods: Patients from a prospective TEVAR database were dichotomized by age (75 and 80 years of age). Older and young patients were compared in three timing scenarios: (1) elective procedures; (2) any emergency (within 15 days from onset); and (3) acute ruptures any emergency subgroup. Primary outcome was perioperative mortality assessed at 30 and 90 days.

Results: Between 2003 and 2015, 141 consecutive TEVARs (74.6% male) were performed. Fifty-seven patients (40.4%) were older than 75 years of age; 28 were octogenarians. Eighty-three TEVARs were performed electively and 58 emergently. Among overall emergencies, 42 TEVARs were for acute ruptures. In the elective scenario, the 30-day mortality rate was 5.0% vs 0 odds ratio [OR], 1.1; 95% confidence interval [CI], 0.98-1.2; P = .25), and 90-day mortality was 7.8% vs 0, for patients older than 75 years of age vs those who were younger than 75, respectively (P = .11). No octogenarian died. In the emergency scenario, 30-day mortality was 41.2% vs 9.8%, for patients older than 75 years of age vs those who were younger than 75, respectively (OR, 6.5; 95% CI, 1.6-26.6; P = .01) with unchanged rates at 90 days. The mortality rate was 80% for octogenarians. In the acute rupture scenario, 30-day mortality was 40% vs 11.1% (OR, 5.3; 95% CI, 1.1-28.99; P = .05) for patients older than 75 years of age whose younger than 75 years of age and 46% vs 10% (OR, 7.5; 95% CI, 1.47-37.46; P = .016) for octogenarians vs younger patients. Rates remained unchanged at 90 days. Patients older than age 75 survived for a mean of 83.98 ± 7.7 months after TEVAR.

Conclusions: In the elderly patient population with DTAAD, mortality risks from TEVAR are strongly related to timing and age. Patients older than 75 years of age, those older than 79 years of DTAADup to five times the 75 years of age, after urgent emergency TEVAR. However, older patients should still be considered for emergent life-saving treatment, given that the majority survices. (J Vasc Surg 2016;64:25-32.)

Clinical results and medical costs of thoracic endovascular aortic repair in patients over 80 years of age

Takashi Yamauchi, Suguru Kubota, Kosei Hasegawa, Hideki Ueda

Received: 7 June 2018 / Accepted: 2 October 2018
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Abstract
Thoracic endovascular aortic repair (TEVAR) is expected to be minimally invasive, especially in older patients. However, clinical results of TEVAR in octogenarians including medical costs are limited. Between 2010 and 2016, a total of 57 patients over 80 years of age (mean age 84.1 ± 3.4 years) underwent TEVAR at our hospital. The proximal landing zone (PLZ) was zone 0 in 7 patients (12.3%), zone 1 in 10 patients (17.5%), zone 2 in 9 patients (15.8%), zone 3 in 13 patients (22.8%), and zone 4 in 18 patients (31.6%). The mean follow-up time was 23 ± 19 months (range 1-71 months). The follow-up rate was 96.5%. The hospital mortality rate was 1.8%. Stroke occurred in three patients (zone 0: 2, zone 3: 1, 33.3%). The mean hospital stay was 21.8 ± 21.4 days (range 5-98 days), and the rate of being discharged home was 84.2%. The 1-year and 3-year survival rates were 76.1% and 55.1% and the 1-year and 3-year re-intervention-free rates of the thoracic aorta were 97.6% and 94.5%, respectively. The mean total cost by the time of hospital discharge was ¥3,360,000 ± 2,360,000. The clinical results of TEVAR in patients over 80 years of age are acceptable with early postoperative recovery, low mortality and morbidity, and midterm durability.

Elective EVAR in Nonagenarians Is Safe in Carefully Selected Patients

George K. Lee, Brant W. Ullery, and Jason T. Lee, Stanford, California

Background: Nonagenarians are typically considered poor operative candidates for major aortic intervention because of shorter life expectancy, multiple comorbidities, and increased perioperative morbidity and mortality. Endovascular abdominal aortic aneurysm repair (EVAR) has clearly been associated with a lower perioperative morbidity and mortality in most anatamically suitable patients. There have been many reports of the technical success of EVAR in octogenarians, but few documenting EVAR in nonagenarians. In this study, we sought to review our experience with elective EVAR in nonagenarians to determine outcomes, complications, and long-term survival after repair.

Methods: We retrospectively reviewed our prospectively maintained aneurysm database from 2000 to 2010 at an academic referral center. Fifteen patients ≥90 years old underwent elective EVAR. No symptomatic or ruptured abdominal aortic aneurysm patients ≥90 years old were treated. Comorbidities, preoperative and postoperative functional status, aneurysm size, and technical success rate were all recorded in accordance with Society for Vascular Surgery reporting guidelines. Follow-up was performed within 30 days, 6 months, and annually thereafter unless more frequent follow-up was indicated.

Our patient’s are aging too!!

Aurania Preventza, MD, Joseph Bavaria, MD, Venkatesh Ramaiah, MD, G. William Moser, CRNP, Wilson Szeto, MD, Grayson Wheatley III, MD, Patrick Moeller, BS, Julio Rodriguez-Lopez, MD, and Edward Diethrich, MD

Department of Cardiovascular and Endovascular Surgery, Arizona Heart Institute, Arizona, and Department of Cardiothoracic Surgery, University of Pennsylvania, Philadelphia, Pennsylvania

Background. The objective of our study is to determine the feasibility of thoracic endovascular aortic graft repair for various thoracic aortic pathologies. The following devices were used: Gore TAG (W.L. Gore, Flagstaff, AZ); Talent (Medtronic, Minneapolis, MN); and Zenith (Cook, Inc, Bloomington, IN). One hundred one (101 of 504; 20%) patients were octogenarians; 60 males (1.81, M/F) with a mean age of 83.7 years. Indications for intervention included the following: atherosclerotic aneurysms, 75 (75 of 101, 74%); acute and chronic dissections, 1111 of 101, 11%; penetrating aortic ulcers, 8 (9 of 101, 9%); contained ruptures, 5 (3 of 101, 5%); and 1 transaction (1 of 101, 1%). Mean length of follow-up was 3.4 ± 2.3 years.

Results. No intraoperative deaths were noted. Thirty-day mortality was 10% (10 of 101 patients) with an overall late mortality of 26.7% (27 of 101 patients). Mean hospital stay was 63 days. A total of 12 neurologic events were noticed: 2 paraplegia (2 of 101, 2%); 4 paraparesis (4 of 101, 4%); 3 with full recovery; and 6 of 101, 6% cerebrovascular accidents with full recovery in half. A total of 13 endoleaks (13 of 101, 15%) were seen and, in 11, interventions were required.

Conclusions. Our data suggest that technical success is high and age-specific outcomes in this group of patients are favorable. Further studies are warranted. (Ann Thorac Surg 2010;90:78-82) © 2010 by The Society of Thoracic Surgeons
TEVAR in 106 year old female

Probably oldest to date !!

Zenith Alpha Thoracic Endovascular Graft
Case

- 106 year old, female
- CC: intermittent back pain
- OC: The patient had intermittent back pain for 1 month before admitted for aspiration pneumonia. CT scan at the admission revealed 6cm saccular aneurysm at the descending thoracic aorta.
- Height: 136 cm, Weight: 33 kg
- BMI: 17.8
Case

- PMH: hypertension, post pacemaker implantation (arrhythmia), post cholecystectomy
- Smoking history: none
- ABI: right 1.06 left 1.07
- ADL: Living together with her daughter and can take care most of the things herself. No dementia or loss of hearing. Can walk using walking aid cart and goes outside home by herself.
Preoperative CT scan
Comparison of CT scan from 1 year ago

48 mm

60 mm
TEVAR in super senile patient???

Frail and older people
Small iliac artery
Zenith Alpha Thoracic Endovascular Graft

One-year outcomes from the international multicenter study of the Zenith Alpha Thoracic Endovascular Graft for thoracic endovascular repair

Karl A. Illig, MD, Takao Ohki, MD, G. Chad Hughes, MD, Masaaki Kato, MD, Hideyuki Shimizu, MD, Himanshu J. Patel, MD, Ali Shahriari, MD, and Shraddha Mehta, PhD, on behalf of Zenith TX2 Low Profile study investigators, Tampa, Fla; Tokyo and Osaka, Japan; Durham, NC; Ann Arbor, Mich; and Indianapolis and West Lafayette, Ind

Objective: This study evaluated the safety and effectiveness of the Zenith Alpha Thoracic Endovascular Graft (Cook Medical, Bloomington, Ind) for the treatment of descending thoracic aortic aneurysms and large ulcers.

Methods: The Zenith Alpha Thoracic Endovascular Graft, with a 16F to 20F delivery system, was developed to address vascular access issues associated with larger-profile devices and to increase conformability in tortuous anatomy. This prospective, nonrandomized, multicenter study was conducted in Europe, Japan, and the United States. The main anatomical inclusion criteria included proximal neck seal zone of ≥20 mm, aortic arch radius of ≥20 mm, and a neck diameter of 15 to 42 mm. Patients were evaluated preprocedure, predischARGE, and postdischarge 1, 6, and 12 months and yearly thereafter through 5 years.

Results: Between March 2010 and January 2013, 110 patients (64 men and 46 women; mean age, 72 ± 10 years) were enrolled in the study for the treatment of descending thoracic aortic aneurysms (n = 90) or ulcers (n = 20). Access was percutaneous in 36% (40 of 110) of patients. The study device was successfully implanted in all but two patients (both due to inability to gain access or advance to the target treatment site). There was no 30-day mortality. Five deaths occurred ≤1 year (only one was aneurysm-related by independent adjudication), resulting in a 95% freedom from all-cause mortality and a 99% freedom from thoracic aortic aneurysm-related mortality. At one or more time points ≤1 year, type I endoleak (all distal) was observed in 4 patients, type III endoleak in 2, and aneurysm growth in 4. Five patients experienced stroke ≤1 year (2 procedure-related). No aortic rupture, paraplegia, paralysis, or permanent spinal cord injury was observed ≤1 year.

Advantages of Zenith Alpha Thoracic

- Treat more patients with TEVAR
  - Lower profile
  - Wide range of sizes: 24-46 mm

- Simplified deployment
  - Deployment in 3 steps

- Designed for durability
  - Precurved, highly flexible inner nitinol cannula
  - Combination of endoleak and migration resistance, patient-specific fit, and precise, controlled deployment
Lower profile introduction system

**Introducer profile**
- 24–30 mm, 16 Fr (18 Fr OD)
- 32–38 mm, 18 Fr (21 Fr OD)
- 40–46 mm, 20 Fr (23 Fr OD)

**Kink-resistant Flexor sheath with hydrophilic coating**

※TX2 20Fr／22Fr（OD7.7mm／8.5mm）
150mm Graft lengths for Native diameter 22-42mm

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Vessel diameter (mm)
TX alpha thoracic 30 x 155mm was placed
TEVAR using Zenith Alpha Thoracic

TX alpha thoracic 30 x 155mm was placed
Summary of perioperative course

- Anesthesia: local anesthesia with dexmedetomidine (no oral intubation)
- Procedure: TEVAR using Zenith Alpha Thoracic with right femoral artery cutdown
- Operation time: 71 minutes
- Bleeding: 10 mL
- Postoperative course: ICU admission for 1 day. Worsening of pleural effusion was observed and managed with diuretics. Discharged on post operative day 11.
Post operative CT scan
Going too far???

Economic issue

Improvement in survival ??

Indication ??
Thank you!!!

(with permission from the patient herself)
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