TEVAR has better long-term survival (>5 years) than open repair for intact DTAA

More New Developments in the Treatment of TBADS
November 19, 2019

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Background

In 1994, thoracic endovascular aortic repair (TEVAR) was introduced as an alternative to open surgical repair for treatment of descending thoracic aortic aneurysms.
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89-year-old woman with history of thoracotomy for TB presents with an expanding "lump" on her back.

In 1994, thoracic endovascular aortic repair (TEVAR) was introduced as an alternative to open surgical repair for treatment of descending thoracic aortic aneurysms. Following U.S. Food and Drug Administration (FDA) approval in 2005, the use of TEVAR has been increasing. This shift in practice has come as a result of excellent perioperative outcomes with TEVAR reported in small prospective nonrandomized trials.

However, larger studies using either the Medicare database or meta-analytic methods have suggested that the survival advantage of TEVAR may be lost by 2 years with open surgical repair potentially having superior midterm outcomes. Reflecting the uncertainty of the comparative effectiveness, professional guidelines fail to offer guidance outside of technical infeasibility for TEVAR or poor candidacy for open surgical repair.
Methods

- Using a Medicare database, this study using a regression discontinuity design and propensity score matching performed on patients with intact DTAA who underwent TEVAR or open repair between 1999 and 2010 with follow-up through 2014.
- Survival was assessed with restrictive mean survival time.
- Perioperative mortality was assessed with logistic regression.
- Matching created comparable groups with 1235 open surgical repairs matched to 2470 TEVAR patients.

Results

- The restricted mean survival time difference favored TEVAR @ 9 years, -209.2 days (p< 0.001) for open surgical repair.
- The odds of perioperative mortality were greater for open surgery High volume center, (centers within the 90th percentile of operative volume: >10 open surgical repairs annually among Medicare beneficiaries), odds ratio (OR): 1.97
  Low volume center, OR: 3.62
DIFFERENCES BETWEEN TEVAR AND ENDOVASCULAR AORTIC REPAIR

The existing published data on TEVAR versus open surgical repair suggests that the survival benefit of TEVAR is lost as early as 2 years but possibly as late as 5 years (1-3). These results appeared to parallel the modest overall survival benefit attributable to endovascular aortic repair for an approximately 3 to 4 years with an RMST difference reported by Schermerhorn et al. of only 5.6 days at 8 years (4-6). This is in stark contrast with the substantial survival advantage in this study, with an RMST difference of 208.2 days and convergence of survival curves at 9 years.


There is a greater variety of aneurysm etiologies that involve the thoracic aorta (degenerative, traumatic, mycotic, penetrating ulcers) with a greater frequency of focal manifestations at the time of diagnosis than in the abdominal aorta where the lesion is usually a degenerative/atherosclerotic aneurysm effecting the entire infra-renal segment.

Possible Explanation

- There is a greater variety of aneurysm etiologies that involve the thoracic aorta (degenerative, traumatic, mycotic, penetrating ulcers) with a greater frequency of focal manifestations at the time of diagnosis than in the abdominal aorta where the lesion is usually a degenerative/atherosclerotic aneurysm effecting the entire infra-renal segment.

Possible Explanation

- Consequently, endovascular repair maybe better suited to the descending thoracic aorta than the abdominal aorta, as there more frequently exist long segments of aorta that may act as appropriate landing zones capable of resisting disease progression for a longer time post-procedure.
- This may explain the difference in comparative effectiveness of endo-vascular and open repair between the descending thoracic aorta and the abdominal aorta.
Conclusions

- Among Medicare beneficiaries, patients undergoing open surgical repair for intact undissected descending thoracic aortic aneurysm had greater odds of early death than TEVAR patients.

- Despite the lower risk of reintervention and lower late hazard of death, open surgical repair only achieved parity with TEVAR after 9 years, resulting in a substantial survival benefit associated with TEVAR.

- The superior survival observed in patients undergoing TEVAR compared with open surgical repair suggests that TEVAR ought to be considered first-line among Medicare beneficiaries with open surgical repair restricted to high-volume centers and patients with low risk of perioperative mortality.