Secondary Aortic Interventions after TEVAR: How Can They Be Prevented; Why Are They Necessary and Do They Improve Outcomes?

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DISCLOSURES

• None

Background: TEVAR Evolution

• TEVAR Inception→
  - high technical success
  - good mid-term outcomes
  - Index pathology = Degenerative aneurysm

• Rapid proliferation to treat non-degenerative pathology = Acute/chronic dissection

• Contemporary TEVAR series→
  - Large proportion = non-degenerative etiologies (~35-50%)

AORTIC-THORACIC STENT INTERACTION

Thoracic Stents

Dynamic Interface

TEVAR: Durability

Patient Selection & Planning – 3D imaging essential

• Anatomic challenges
  - Diameter Δ
  - Coverage Length
  - Morphology
  - Angulation
  - Thrombus
  - Calcification
  - Access
  - False lumen

TEVAR: Failure Modes

• TAA → endoleak
  - Dissection (acute/chronic) → false lumen perfusion

• Secondary Aortic Re-intervention Rates
  - TAA ~15-20%
  - Chronic Dissection ~30-35%
  - Acute Dissection ~30-50%
UF Initial TEVAR Indications


- Acute Dissection: 13%
- Degenerative Aneurysm: 46%
- Chronic Dissection/ Aneurysm: 14%
- Traumatic Transection: 12%
- Penetrating ulcer: 3%

Rate of SAI by TEVAR Indication

- N= 1037 Patients
- 145 Patients required SAI (14%)

SAI Indication by TEVAR Pathology

- TAA
  - Type 1a/b endoleak > Type II > Type III > Remote aortic site > Type IV/V
- Acute Dissection
  - Distal LZ > Proximal LZ > Remote aortic site
- Chronic Dissection
  - Remote aortic site ~ Distal LZ > Proximal LZ

Survival after TEVAR with SAI

- Log-rank P = .8

Survival after SAI for TEVAR: Dissection

- Acute Dissection
  - P=0.21
- Chronic Dissection
  - P=0.72

Prevention/Treatment - Endoleak

- Type I endoleaks
  - 2cm Proximal/Distal LZ, parallel, non-aneurysmal, non-dissected aorta
  - Oversizing principles pathology based
  - Heli-Fx EndoAnchors (degenerative disease only)
- Type II endoleaks
  - Most inter-costal arteries are self-limited
  - LSCA/celiac embolization (if anticipating coverage)
- Type III endoleaks
  - ↑ Overlap (increase with larger aneurysms/tortuosity)
  - EndoAnchors
Prevention/Treatment - False Lumen

- Re-entry/septal tears
  - vascular occlusion plugs
  - stent-graft (if associated with renal/mesenteric)
  - distal aortic extension (“SCI risk”)
- Persistent False Lumen Perfusion
  - coil embolization
  - distal bare stents (e.g. PETTICOAT)
  - Knickerbocker
  - Candy-plug
  - fenestration of septum
  - index TEVAR length
  - f/bEVAR

CONCLUSIONS

- TEVAR can be a durable solution for aortic diseases with appropriate patient selection and planning
- Non-degenerative related disease has several challenges to overcome since the entire aorta is vulnerable
- Re-intervention may be a necessary component of the treatment algorithm and does not appear to negatively impact long-term survival
- Technology is improving to address this issue and future rates will hopefully decrease

THANK YOU