Progress In The Endovascular Treatment Of Type A Aortic Dissections

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TEVAR for Type A Aortic Dissection (TAAD)

- Goals:
  - cover the origin of the intimal tear to prevent rupture
  - reduce pressure and promote thrombosis of the false lumen
- Contraindications
  - severe aortic valve regurgitation
  - involvement of the aortic root
  - Connective tissue disorder except as a temporizing solution

Challenges of endovascular ascending aortic repair

- complex spatial geometry
- great dynamic strain & changes in diameter/area during cardiac cycle
  - curved configuration
  - high blood flow
  - pulsatile movement
- Greatest changes in diameter 5 mm distal to coronaries arteries (~17%)
TEVAR for TAAD

- IVUS & angio to assess landing zones
- <10% oversizing based on PLZ
- PE > 5mm distal to coronary ostia
- DE may cover 1/3 of the IA origin
  - Left-to-right carotid-to-carotid bypass
- TVP (160-180 bpm) vs. Adenosine (36 mg IV)

TEVAR for TAAD

- 32%-50% of patients eligible
  - Absence of PLZ → #1 reason for exclusion
  - Carotid-to-carotid bypass to extend DLZ
- Complications
  - Stroke → ischemia vs embolism
  - 3.5%-5.5%
  - Excessive manipulation
  - Air embolism
  - Coronary artery coverage
  - Aortic valve dysfunction
  - Rupture or retrograde dissection
  - Endoleaks

TEVAR for TAAD

- 45 patients with entry tear in
  - Ascending aorta, 10
  - Arch, 14
  - Descending aorta, 21
  - Technical success, 97%
  - 30-day mortality, 6.7%

TEVAR for TAAD

- 2 strokes (left CCA conduit)
- Type I endoleak, 10 cases
- Ballooning of the PLZ
- Proximal cuff

TEVAR for TAAD

- PS-IDE
- Device designed specifically for deployment in the ascending aorta
  - 39 patients screened → 6 enrolled
  - No 30-day mortality
  - 1 late mortality / 1 stroke
  - 1 type 1A endoleak

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**ASCEND STENT-GRAFT**

- International experience with endovascular therapy of the ascending aorta with a dedicated endograft
- 10 patients (Mean age, 67 years old)
- Zenith ASCEND stent-graft
- Dissection 5, aneurysm 4 and fixation of dislodged valve in 1
- Transfemoral approach in 8 and transapical in 2
- One 30-day mortality and one stroke (10%)
- Mean FU, 10 months (2 reinterventions)

**ASCENDING STENT-GRAFTS**

- From the Society for Vascular Surgery
- A systematic review of primary endovascular repair of the ascending aorta
- Thoracic stent-grafts (70%), AAA cuff (15%), custom (15%)
- Indications: acute dissection (50%), pseudoaneurysm (35%), PAU (5%)
- Type IA endoleak, 18%
- All cause mortality, 15%
- Stroke/ conversion (3.5% each)

**Conclusions**

- Current endovascular technology offers an alternative treatment option in selected high-risk patients with acute type A dissection who are unfit for surgical repair, which remains the standard of care
  - Acute type A aortic dissection and pseudoaneurysms in a redo setting
  - High STS operative risk score
- Current endografts are not disease-specific and based on current TEVAR and TAVR technology
- Future innovations need to provide disease-specific devices and solutions to expand the use of TEVAR for TAAD