Various Cardiac Access Routes To Treat Ascending Aortic And Arch Lesions: Advantages And Limitations

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**Limitations of Transfemoral Access**
- Distance to ascending and arch
- Tortuosity and kinking
- Hemodynamic forces
- Left ventricular wire-position
- Difficult true lumen access
- Apposition

**Unusual Access Routes**
- Retrograde:
  - Transsubclavian
  - Transcarotid
  - Thoracoscopic
- Antegrade (transcardiac):
  - Transapical
  - Transseptal

**Transapical Access**
- Short, straight route
- Well established Access
- Easy access to the aortic valve and true lumen
- Pericardiac drainage

**Transapical TEVAR**
Transapical Throughwire

Transapical Branched Arch
- Percutaneous transapical access
- Single internal branch arch endograft
- 8 domestic pigs

Transseptal Access

Transseptal Through & Through

Wipper et al. 2016, J Endovasc Ther: accepted

Wipper et al. 2012; J Endovasc Ther 19:679-88

Wipper et al. 2015; J Endovasc Ther 22:375-84

Transseptal Through & Through

Transseptal TEVAR
The Future?

Thoracoscopic
Transsubclavian
**Transapical**
Transseptal

Advantages (Transapical):
- Short and straight route
- Unlimited diameter
- Easy to establish throughwire
- Easy passage of aortic valve into true lumen
- Standardized and wide-spread access

Limitations (Transapical):
- Cardiac surgeon and mini-thoracotomy required
- Specific risks: tamponade, drain required
- Graft-design made for retrograde delivery
- Access to descending aorta limited

Precautions (Transapical):
- Careful case-planning
- Careful graft- and patient-selection
- Preop TEE
- Through and throughwire to the groin
- Output-reduction by IVC-occlusion

Summary
- Stentgrafts for acute type A dissection potentially beneficial in selected patients.
- Transfemoral delivery challenging because of distance, tortuosity and hemodynamics.
- Transapical access route potentially easier.
- Currently available stent-grafts do not meet requirements.
- Role of endovascular treatment in the ascending aorta yet to be defined.