Thoracic Endovascular Aortic Repair (TEVAR)
Indications and Basic Procedure

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Disclosure

Speaker name:
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I have the following potential conflicts of interest to report:

☐ Consulting
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☒ Other: Proctoring, travel, research-grants, patents with Cook Medical

☐ I do not have any potential conflict of interest
Michael Dake, Radiologist, Stanford, USA

First clinical report on TEVAR 1994:

„Transluminal placement of endovascular stent-grafts for the treatment of descending thoracic aortic aneurysm“

Dake et al. 1994; N Engl J Med 331:1729-34
Descending Aorta: Open Repair vs. TEVAR

Metaanalysis of comparative studies
TAA and dissection \( n = 5888 \)

TEVAR better:
- 30d mortality
- Paraplegia
- Transfusion
- Cardiac and resp. compl.
- Kidney function
- Reintervention
- Hospital and ICU stay

Cheng et al. 2010; JACC 55: 986-1001
Disease Specific Indication

Aneurysm
Dissection
Transsection
Coarctation
Thoracic Aortic Aneurysm

Operative treatment (TEVAR) if:

- Diameter > 5.5-6cm
- Diameter growth >0.5-1cm/year
- Symptoms:
  - Pain
  - Local compression
  - Rupture
Type B Aortic Dissection

Operative treatment (TEVAR) if:

Acute:

- Malperfusion: visceral, renal, peripheral
- Rupture and hemorrhage
- Early dilatation, other prognostic factors

Chronic:

- False-lumen aneurysm > 5.5-6cm
- False-lumen aneurysm growth > 0.5-1cm/year
- Claudication, rupture and hemorrhage
Type B Aortic Dissection
Traumatic Aortic Rupture

Operative treatment (TEVAR) if:

- Grade 2-lesion (intramural hematoma)
- Grade 3-lesion (pseudoaneurysm)
- Grade 4-lesion (hemorrhage)
Coarctation

Operative treatment (TEVAR) if:

- Symptoms:
  - Claudication
  - Headache
  - peak-to-peak gradient of >20 mm Hg at rest or >30 mmHg after exercise.
- Left Ventricular dysfunction and hypertrophy
- Refractory hypertension
Standard Procedure

- Efficacy
- Costs
- Time
- Mistakes

"Our standards are very high. We even have high double standards."
Most technical Errors follow insufficient planning!
Workstation
Mikropunktionsset:

- 27 G Nadel
- 0.018 Draht
- 2 Hülsen
Access
Access

- 6F-sheath for access-side
  - Heparine 100IU/kg, ACT

- Stiff double-curved wire into ascending aorta

- Angio catheter into arch from contralateral femoral artery or brachial artery

- Serial Dilators
Iliac Conduit
Paving and Cracking
Through & Through-Wire

Stiff Guidewire

Soft transbrachial Throughwire
Graft Preparation

- Remove peel-away, mandrin, etc.
- Fasten screws, stop-cocks.
- Flush central lumen and graft.
- Follow graft-specific instructions.
Arch-angiography
Arch-angiography
Proximal Deployment
Component Overlap

- Overlap
  - 5 cm in TAA
  - 2 cm in dissection
Distal Deployment
Dilatation

* Compliant Balloon
Final Angiography

- Reposition pigtail
- Overview
- Apnea
- Late images
Access Closure

- Percutaneous
- Open surgical

“I expect you all to be independent, innovative, critical thinkers who will do exactly as I say!”
Rapid development of devices, techniques, and operator skills.

TEVAR is the standard of care for lesions in the descending thoracic aorta.

Preoperative planning, device-selection and sizing of TEVAR is mandatory.

Endovascular treatment will continue to challenge open surgery also for lesions of the aortic arch and the ascending aorta.
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