The Current Status Of Endovascular Repair Of Ascending Aorta And Aortic Arch

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Shareholder Mokita-Medical GmbH
Indication for Ascend Grafts

- Lesions post surgery:
  - Pseudoaneurysm
  - Postsurgery bleeding
  - Residual Dissection
  - Lost TAVI

- Type A dissection

- Ascending aneurysm
The first endovascular repair of an acute type A dissection using an endograft designed for the ascending aorta

Matthew J. Metcalfe, MD, MRCS, Alan Karthikesalingam, MRCS, Steve A. Black, FRCS, Ian M. Loftus, MD, FRCS, Robert Morgan, FRCR, and Matt M. Thompson, MD, FRCS, London, United Kingdom
Ascending TEVAR for TAAD

Outcomes of Endovascular Repair of Ascending Aortic Dissection in Patients Unsuitable for Direct Surgical Repair

Zhenjiang Li, MD, Qingsheng Lu, MD, Rui Feng, MD, Jian Zhou, MD, Zhiqing Zhao, MD, Junmin Bao, MD, Xiang Feng, MD, Jiaxuan Feng, MD, Yifei Pei, MD, Chao Song, MD, Zaiping Jing, MD, PhD

- 2009-2011 n=15
- Intervall: 26 days
- Technical success: 15
- Open conversion: 1
- Mortality: 0

Li et al. 2016; J Am Coll Cardiol 68:1944-54
Ascending TEVAR

**Hamburg Experience 2010-2017:**

- **Cases:** 24
  - Dissection: 15
  - Pseudoaneurysm: 5
  - Dislocated TAVI: 2
  - Other: 2

- **Urgent/emergent** 14

- **Access:**
  - Transfemoral: 18
  - Transapical: 4
  - Transsubclavian: 2

- **30d-mortality:** 5 (21%)
- **1y-mortality:** 6 (25%)
- **Stroke:** 3 (13%)

Tsilimparis et al. 2018; J Vasc Surg accepted
Endograft Choice

- Length: measure at outer curve 6-10cm
- Diameter: measure on Centerline
- Tapered grafts
  - Reverse tapering
- On-table customization
Oversizing

- Native aorta or graft
- Gated or non-gated CT
- Systolic or diastolic
- Age
- Bloodloss....
- Generally: 15-25%
Inner Curve Apposition

Cook Zenith TBE ProForm

77-81mm
Gore ARISE Study

Early human feasibility trial

- Acute TAAD
- Staged release
- Active control system
- 7/10 patients included

Courtesy of H. Patel, Ann Arbor

Courtesy of Michael Dake
Indications:

- Lesions post surgery:
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- Ascending aneurysm

- Type A dissection
Valved Conduit

Porcine study:

- Bolton NBS ascending SG
- Symetis valve

Courtesy of Martin Czerny, Freiburg

Valved Conduit – Endo-Bentall
Combined Ascend + Branched Arch Endograft in acute TAAD

Kölbel et al. 2017, J Endovasc Surg 24: 75-80
Combined Ascend + Branched Arch

Combined Ascending Aortic Stent-Graft and Inner Branched Arch Device for Type A Aortic Dissection

Yuk Law, FRCS, Nikolaos Tsilimparis, MD, Fiona Rohlffs, MD, Vladimir Makaloski, MD, E. Sebastian Debus, MD, PhD, and Tilo Köbel, MD, PhD

* Case series n=5
* Technical success 5/5
* 1y mortality 2/5 (aTAAD)

Complex Arch Endografts

Branched SG ≠ Fenestrated SG
Cook Branched Arch Endograft

Hamburg Experience 2012-2017:

- Cases: 54
  - Aneurysm/PAU: 28
  - Residual dissection: 24
  - Acute Type A: 2
- 30d-Mortality: 3 (5.5%)
- Clinical stroke: 4 (7%)

Post TAAD-Repair

Inner-Branched Endografts for the Treatment of Aortic Arch Aneurysms After Open Ascending Aortic Replacement for Type A Dissection

Charles P. E. Milne, MBBS (Hons), FRACS (Vasc), Mau Amako, MD, PhD, Rafaelle Spear, MD, PhD, Rachel E. Clough, MRCS, PhD, Adrien Hertault, MD, Jonathan Sobocinski, MD, PhD, Wendy Brown, MBBS (Hons), PhD, and Stéphan Haulon, MD, PhD

- N=73; 2009-2015 Type 1 AD
- Eligibility for B-TEVAR
- Access, diameter, angulation
- 70% anatomically suitable

Milne et al. 2016; Ann Thor Surg; epub
Anatomical Suitability

✓ Suitable: 70%
✗ Graft too short: 21%
✗ Major Kink: 7%

Post TAAD-Repair
Residual Dissection
Residual Dissection

Bilateral carotid-subclavian bypass

Axillo-axillary bypass
Chronic TAAD

Multicenter Experience Chronic TAAD:

- 13 Centers, 9 countries, 2012-2018
- Patients: 70
  - Male: 50
  - Age: 69y
- Technical success: 68 (97%)
- Stroke: 2 (3%)
- 30d-Mortality: 2 (3%)
- 1y-mortality: 8 (11%)

Verscheuren et al. Unpublished data.
Cook Branched Arch with 3 Inner Branches

- **N=3; 2016-2017**
- **Technical success all 3**
- **Procedure time 3h**
- **All 3 uncomplicated course**

Spear et al. 2017; J Endovasc Surg 24:534-8
Fenestrated Arch
Anatomical Suitability

- Diameter ≤ 38mm
- Proximal landing zone ≥ 20mm
- Appropriate access vessels
- Landing zone in mid-arch
Hamburg Experience 2011-2017:

- Cases: 40
  - Aneuysm: 25
  - Chronic dissection: 8
  - PAU: 7
- 30d-Mortality: 4
- Stroke: 4
Fenestrated Arch Endograft

Advantage of a precurved fenestrated endograft for aortic arch disease: Simplified arch aneurysm treatment in Japan 2010 and 2011

Yoshihiko Yokoi, MD, Takashi Azuma, MD, and Kenji Yamazaki, MD, PhD

- Multicentre Japan; n=383
- Zone 0: n=363
- Technical success: 99%
- 30d mortality: 1.6%
- Stroke: 1.8%

Endovascular Treatment of ascending and aortic arch aorta beneficial in selected patients.

Postsurgery lesions and post Type A dissection work best.

Ascending aneurysms in native vessel do not.

Significant progress in device development recently.
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