What is the Future of Endovascular Repair of Aortic Arch Lesions?
Advantages and Limitations of Two Endo-Techniques

Tilo Köhler
Sebastian Debus, Yskert von Kodolitsch,
Christian Detter, Nikos Tsilimparis
German Aortic Center
University Heart Center Hamburg

Gold Standard for the Arch

Surgery for the aortic arch:
- Open repair
- Elephant trunk
Mortality rates 5-15%
Stroke: 4-12%

Hybrid Arch Repair

Debranching + TEVAR
- No Cardio-pulmonary Bypass
- Debranching technique
- Mortality: ≈ 13% (Zone 0)

Chiesa et al. 2010 J Endovasc Ther 17:1-11
Tsagakis et al. 2013 Ann Cardiothorac Surg 2:612-20

Endovascular Options for the Aortic Arch

- Chimney Grafts
- In-Situ Fenestration
- Fenestrated/ Branched Stent-grafts

Branched Arch Endograft

Global experience with an inner branched arch endograft

- 2009-2013
- Multicenter Study
- n = 38
- Technical success 92/98
- Mortality 5/38 (13%)
- Stroke/TIA 6/38 (16%)

Cook Branched Arch Endograft

Subsequent experience:
- n = 27; Hamburg, Tokio, Lille
- 4/2013-11/2014
- Technical success: 27/27
- 30d Mortality: 0/27
- 1y mortality: 1/27
- Stroke/TIA: 3/27

Branched Arch Anatomical Suitability

- Diameter ≤ 38mm
- Length Ascending ≥ 65mm
- Length sealing zone ≥ 40mm
- Innominate diameter ≤ 20mm
- Appropriate access vessels
- No significant aortic regurg
- No mechanical aortic valve
- No dissection of branch vessels
- Sealing zone in mid/prox. Ascending aorta

Lesion-Type

- Aneurysm and PAU of the arch
- Chronic dissection
- Acute Type A dissection

Residual Dissection

Additional Debranching

- Bilateral carotid-subclavian bypass
- Axillo-axillary bypass

Secondary Embolisation
**Connective Tissue Disease**

**Branched Arch Endograft**

**Hamburg Experience 2012-2015:**
- Cases: 20
- Aneurysm: 9
- Chronic dissection: 8
- Acute Type A: 1
- PAU: 2
- 30d-Mortality: 0
- Stroke: 2

**Cook – Fenestrated Arch Endograft**

**Fenestrated Arch Anatomical Suitability**
- Diameter ≤ 38mm
- Proximal landing zone ≥ 20mm
- Appropriate access vessels
- Landing zone in mid-arch

**Fenestrated Arch Endograft**

**Fenestrated Arch Grafts**

**Advantages:**
- Short procedure: 60-120min.
- Ascending diameter less important.
- Avoids landing in proximal native ascending.
- No cutdown for IA-stent
- No LV-wire necessary
**Fenestrated Arch Grafts**

**Limitations:**
- Alignment of fenestrations necessary.
- Technically demanding.
- No strutfree fenestrations larger than 12mm.
- No outer curvature arch lesions.
- No ascending pathology.

**Conclusion**
- Fenestrated and branched grafts feasible for high-risk patients.
- Peri-operative morbidity and mortality acceptable.
- Innovative new techniques under investigation.
- Limited evidence and a significant learning curve.
- The future in aortic arch repair is endovascular.

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**Branched Arch Grafts**

**Limitations:**
- Branch alignment is forgiving.
- Reliable seal due to internal cuffs.
- Treats arch and ascending pathology with branch extension.
- Potential off-the-shelf device.

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**Comparing...**