Ascending Aorta: Is The Endovascular Approach Realistic?

Tilo Kölbel, Nikos Tsilimparis, Fiona Rohlffs, Sabine Wipper, Sebastian Debus

German Aortic Center, Hamburg
University Heart Center
University Hospital Eppendorf
Disclosures

- Research grants, travelling, proctoring, speaking fees, IP with Cook Medical.
Gold Standard for Ascending Aorta

Open Surgery:
- Sternotomy, CPB
- Ascending replacement
- With/without aortic valve
- Hemiarch/elephant trunk

Gold Standard for Ascending Aorta

But..........

Patients with

* Old age
* Severe comorbidities
* Previous cardiac surgery
* ...


Estrera et al. 2010, Ann Thorac Surg 89:1467-74
Gold Standard for Ascending Aorta

But........

Patients with
  * Old age
  * Severe comorbidities
  * Previous cardiac surgery
  * ...

are often turned down for open surgery

and

might benefit from a less invasive therapy.

Bonser et al. 2011, *JACC* 58: 2455-73
Endovascular Treatment of the Ascending Aorta

Is there room for Endovascular techniques in ascending pathology?
Endovascular Treatment of the Ascending Aorta

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

- Ascending aneurysm

- Type A dissection
Pseudoaneurysm
Postsurgery Bleeding
Residual Dissection
Lost TAVI
Ascending Aneurysm

- Most are conical and lack proximal landing zone.

- Endovascular exclusion usually not possible in native vessel.

Kolvenbach et al. 2011; J Vasc Surg 53: 1431-8
Ascending Aorta and Arch:
Endovascular Repair of Type A Aortic Dissection

Is there room for Endovascular techniques in acute Type A Aortic dissection?
Acute Type A Dissection

Endovascular Approaches to Acute Aortic Type A Dissection: A CT-Based Feasibility Study

J. Sobocinski a, N. O’Brien a, B. Maurel b, M. Bartoli c, Y. Goueffic d, T. Sassard e, M. Midulla f, M. Koussa a, A. Vincentelli a, S. Haulon a,*

Conclusion

It is reasonable to extrapolate that the same proportion of patients who currently refused surgery on the basis of being unfit for open repair would have anatomy suitable for an endovascular repair. Clinical studies should be conducted in this subgroup of patients to determine a potential future role of endovascular repair in acute type A dissections.

Sobocinski et al 2011, EJ VES 42: 442-7
Anatomical Suitability

- Entry-tear distal to sino-tubular junction
- Proximal and distal landing zone ≥ 20mm
- True lumen diameter ≤ 38mm
- Total lumen diameter ≤ 46mm
- Appropriate access vessels
- No significant Aortic regurge

Sobocinski et al 2011, EJVES 42: 442-7

50% potential candidates!
Endovascular Stenting of the Ascending Aorta for Type A Aortic Dissections in Patients at High Risk for Open Surgery

S. Ronchey a, E. Serra a, V. Alberti a, S. Fazzini a, S. Trimarchi b, J.L. Telenaar b, N. Mangialardi a,⁎

a Department of Vascular Surgery, San Filippo Neri Hospital, Via Martinetti 20, 00135 Rome, Italy
b Thoracic Aortic Research Center, Policlinico San Donato IRCCS, Milan, Italy

Conclusion: Endovascular treatment of TAAD is challenging but feasible in a selected subset of patients. Further research remains mandatory.
Chronic Type A Dissection

Transseptal Guidewire Stabilization Facilitates Stent-Graft Deployment for Persistent Proximal Ascending Aortic Dissection

Gerald Dorros, MD; Ari M. Dorros, MD; Sara Planton, RN; Daniel O’Hair, MD; and Mahmoud Zayed, MD

Dorros et al. 2000, J EVT 7: 506-12
Chronic Type A Dissection

Indication, timing and results of endovascular treatment of type A aortic dissection

C. A. Nienaber, S. Kische, I. Akin, A. Liebold, B. Weidtmann, H. Ince, T. C. Rehders

- Subacute / chronic
- n = 6
- Technical success 5/6
- Mortality 1/6

Nienaber et al. 2011; J Vasc Endovasc Surg (It) 18: 187-91
Acute Type A Dissection

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

Global experience with an inner branched arch endograft

Stephan Haulon, MD, PhD,1 Roy K. Greenberg, MD,2 Rafaëlle Spear, MD,4 Matt Eagleton, MD,3 Cherrie Abraham, MD,5 Christos Lioutpis, MD,6 Eric Verhoeven, MD, PhD, 7 Krauss Ivanecv, MD,8 Tito Külbel, MD,7 Brendan Stanley, MD,9 Timothy Reseh, MD,8 Pascal Desgranges, MD, PhD,1 Blandine Maurel, MD,9 Blayne Roeder, PhD, Timothy Chuter, MD,9 and Tara Mastracci, MD9

* Multicenter Study
* n = 38
* Technical success 32/38
* Mortality 5/38 (13%)
* Stroke/TIA 6/38

Acute Type A Dissection
Branched Arch Endograft
Limitations of Femoral Access

- Distance to ascending and arch
- Tortuosity and kinking
- Left ventricular wire-position
- Difficult true lumen access
- Apposition
Acute Type A Dissection
Transapical TEVAR

Acute Type A Dissection
Transapical TEVAR

Transapical TEVAR

Transapical TEVAR

24m postop.
Is the Endovascular Approach Realistic?

- Yes, in selected cases.

- Remaining problems:
  - Pulsatility, movement of aortic arch
  - Impact of endografts on AV unknown
  - Proximal seal
  - Patient selection
  - Best access
  - Referral and interdisciplinarity

- Most beneficial after previous surgery:
  - Higher risk in Redo-surgery
  - Safe proximal landing.
Endovascular treatment of ascending aorta potentially beneficial in selected patients.

Postsurgery lesions and Type A dissection work.

Ascending aneurysms in native vessel do not.

Transfemoral delivery challenging, 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.