Endovascular treatment of acute type A aortic dissection- the endo Bentall approach

Martin Czerny
Content

Basic insights into pathological process

Dissection induced geometry changes

Initial attempts

Dedicated programme

Future developments

Summary
The aorta displays heterogeneity regarding developmental origin \(^2\)

- Neural crest
- Secondary heart field SMCs
- Secondary heart field MMCs

Dijke, Arthur, Nat Rev 2007
CT Angiography

From the first frame, segment aorta lumen

Schwartz, Czerny, Biomed Imag 2012
CT Angiography

From segmentation and deformation fields, extract motion

Schwartz, Czerny, Biomed Imag 2012
Results

Schwartz, Czerny, Biomed Imag 2012
Intraoperative view
Morphological correlate

Sobocinski EJVES 2011
Functional imaging
Functional imaging
Functional imaging
Functional imaging
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Summary
Objective

To assess the extent of changes in aortic geometry induced by the dissection process by means of computed tomography angiography (CTA) obtained prior and after acute type A aortic dissection.
Methods
Methods
Results

- Overall 63 patients
- Median age 68 years
- 46% females
- Similar risk profile
- Pre-dissection ascending diameter was <50 mm in all

AADA
N=63

Spontaneous
N=27

Retrograde
N=36
Results

Pre-Dissection | Post-Dissection
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Pre-Dissection

Post-Dissection

48.8mm | 51.4mm
49.6mm | 64.0mm
35.6mm | 38.4mm
Results

**Spontaneous AADA**

**Retrograde AADA**

- **Mid-Ascending Aortic Diameter (mm)**
  - Pre-Dissection: 40.1mm
  - Post-Dissection: 52.9mm (+12.8mm (+32%))
  - p<0.001
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Summary
Ideal clinical scenario
Alternative approaches - still experimental
Completion CT scan
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Sobocinski EJVES 2011
Concept Prototype

Distal extension to cover to the level of the brachiocephalic trunk

Aortic valve  Perfusion  Covered to exclude entry
Developing a single-unit endovascular device for simultaneous ascending and aortic valve is a question of time. A novel composite endovascular valved graft will extend the application of transcatheter techniques to patients denied TAVI due to a concomitant ascending aneurysm and those with acute type A dissection with high risk of mortality.
Summary

Thorough understanding of pathophysiology is key.

Complexity is amplified as compared to distal aortic segments.

A tube alone is not sufficient to treat the majority of patients.

The endoconduit is already clinical reality.

Combining knowledge and technology will further pave the way.