R & D challenges associated with endografting of type A aortic dissections

Martin Czerny

Content

Basic insights into pathological process

Dissection induced geometry changes

Initial attempts

Dedicated programme

Future developments

Summary

The aorta displays heterogenity regarding developmental origin²





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





Schwartz, Czerny, Biomed Imag 2012

Intraoperative view



Morphological correlate



Sobocinski EJVES 2011











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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







Results

- **Overall 63 patients**
 - Median age 68 years
 - 46% females
 - Similar risk profile •
 - Pre-dissection ascending diameter was <50 mm in all ۲





Results



Results





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Ideal clinical scenario



Alternative approaches- still experimental



Completion CT scan



Zimpfer, Czerny ATS 2006

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day 0



day 5













Thinl



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Sobocinski EJVES 2011

Concept Prototype

Distal extension to cover to the level of the brachiocephalic trunk







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

Efforts for a valved conduit are ongoing

Combining knowledge and technology will pave the way