News from Imaging and 3D Printing for Aortic Disease

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Disclosure of Interest

Speaker name: ............ L. Maene .........................................................

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Shareholder in a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest
Imaging & Aortic disease

- Basic Imaging
- 3D Imaging
- 3D Analytics
- 3D Printing
That moment ...
when you realize it’s not a chair...
3D Imaging

- Segmentation & Volume Rendering
• Segmentation & Volume rendering

- Easy
- Fast
- Reliable
- All sources
• Segmentation & Volume rendering

  – Aortic Isolation

  • Flow Lumen
  • Aneurysm sac
  • Ca++
  • Endoleaks
• Segmentation & Volume rendering

  – Aortic Isolation
  – Element Isolation
• Segmentation & Volume rendering
  – Changing Configuration / Morphology
3D Analytics  2016

• Segmentation & Volume rendering

– Changing Configuration / Morphology

2013 :
• Flow
• Graft

2015 :
• Flow
• Graft
• Segmentation & Volume rendering

– Aneurysm Volume Analysis (post implant → 2Y FU)
• 3D Pre-Operative Graft Planning : Prototype
• 3D Pre-Operative Planning TAVI:
  Validated Physics based simulation
• 3D Pre-Operative Planning TAVI: Validation

Sellers score

N=45
N=15

Predicted PVL [ml/s]

Case 1  Case 2  Case 3  Case 4

MSCT pre-TAVI

MSCT post-TAVI

Model prediction

Cut-off: 16 ml/s

Sensitivity: 0.80
Specificity: 0.80

De Jaegere et al, JACC Card Int 9, 2016
• 3D Pre-Operative VIRTUAL TAVI:

- Simulation data:
  - Simulated device
  - Calcium-LCA ostium distance: CV26 6 mm, CV29 5 mm
  - Calcium-RCA ostium distance: CV26 8 mm, CV29 8 mm
  - Implantation depth NCC: CV26 7 mm, CV29 11 mm
  - Implantation depth LCC: CV26 6 mm, CV29 8 mm
  - Paravalvular regurgitation: CV26 38 ml/s, CV29 14 ml/s

- 26mm CoreValve
- 29mm CoreValve
3D Analytics  Soon ...

- Validated Physics based simulation ...
  - Mitral valve
  - LAA Closure
  - Devices
  - TEVAR / EVAR
3D Printing 2016

Courtesy Materialise
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