

My secret tool to assess and predict graft malapposition and migration

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Disclosure

- Co-founder of Endovascular Diagnostics

Background

- Current (CT, duplex, X-ray) post-EVAR FU is focused on complications (endoleaks, AAA growth)
- Slight changes in apposition, aortic neck morphology, and endograft dimensions are missed
- ***FU imaging should prevent/ predict complications and not only show complications***

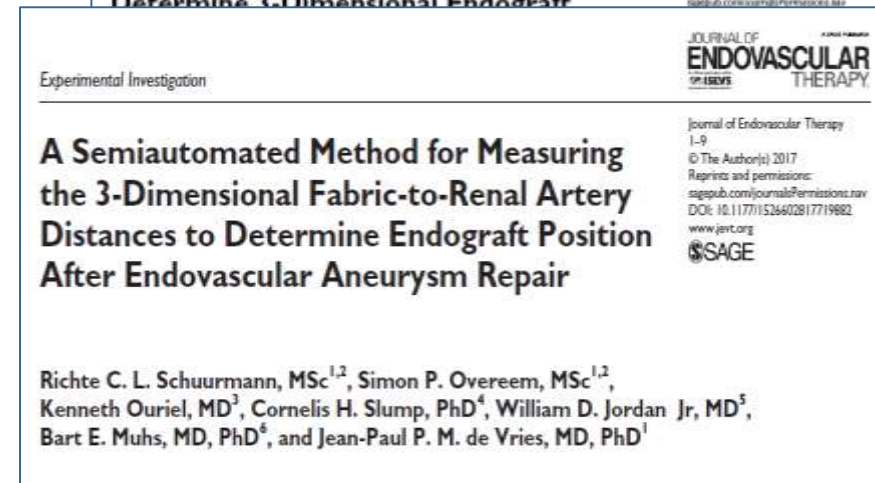
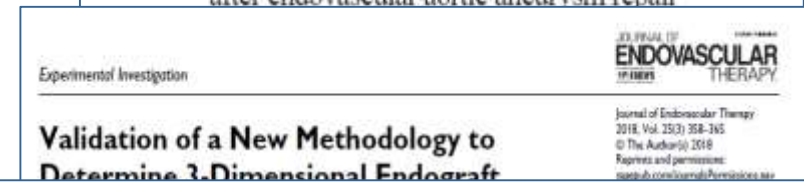
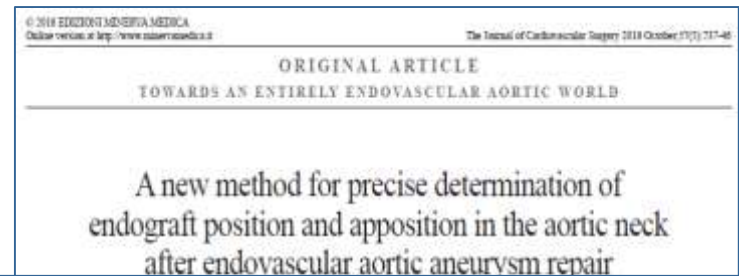
Vascular Imaging Analysis (VIA) Software

- Dedicated, validated proprietary software
- 3D coordinates from 3Mensio workstation



VIA Software - validation

1. Introduction & implications
2. Technical validation



A new method for precise determination of endograft position and apposition in the aortic neck after endovascular aortic aneurysm repair

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Kim VAN NOORT^{1,2*}, Richte C. L. SCHUURMANN^{1,2}, Cornelis H. SLUMP³,
Jan A. VOS⁴, Jean-Paul P. M. DE VRIES¹

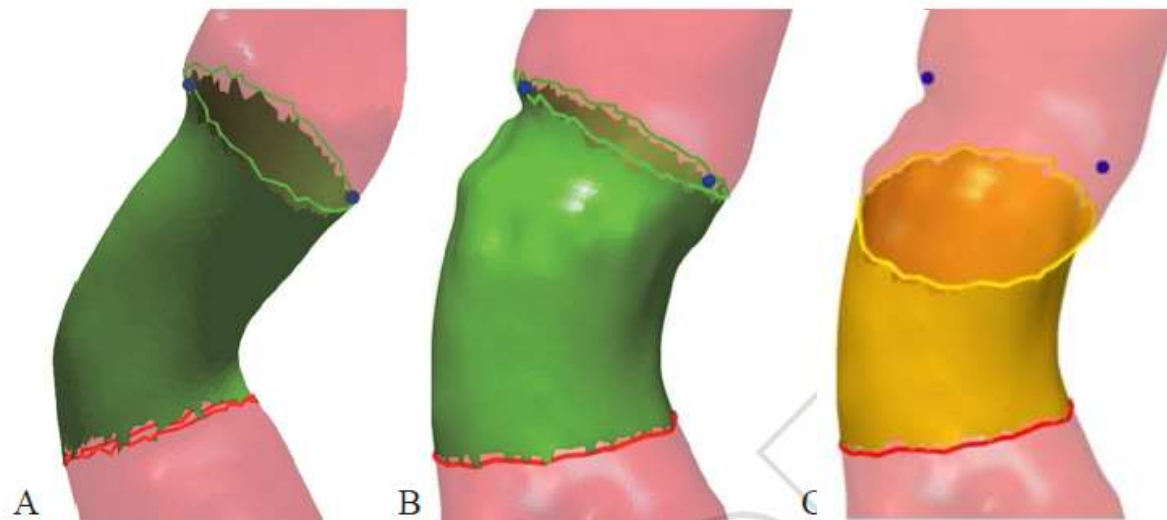


Figure 1.—Determination of aortic neck surface (ANS, green surface) and endograft apposition surface (EAS, yellow). A) Pre-EVAR ANS (green surface) is the surface between lower margins of the renal arteries (blue dots) and the distal end of the neck (red line). B) Post-EVAR ANS (green surface) is the surface between the lower margins of the renal arteries (blue dots) and the distal apposition boundary (DAB) (red line). C) Post-EVAR EAS in the aortic neck (yellow surface) between the proximal end of the endograft fabric (yellow line) and DAB (red line).

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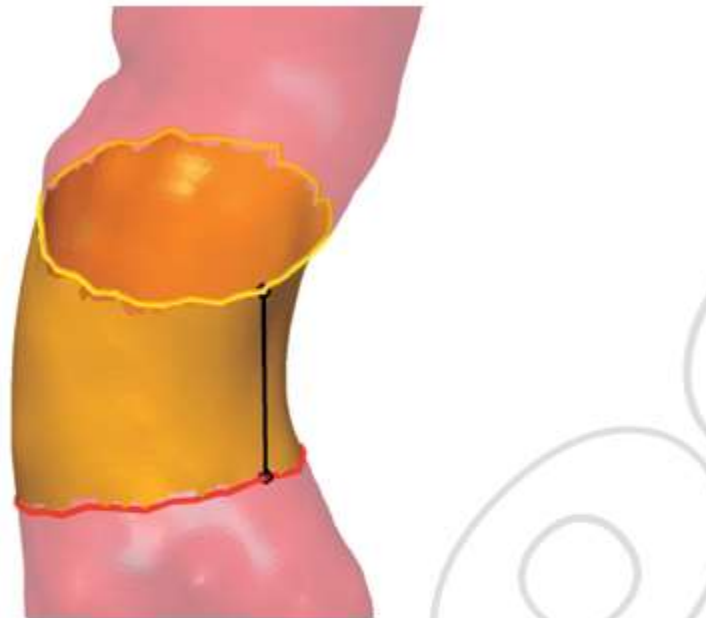
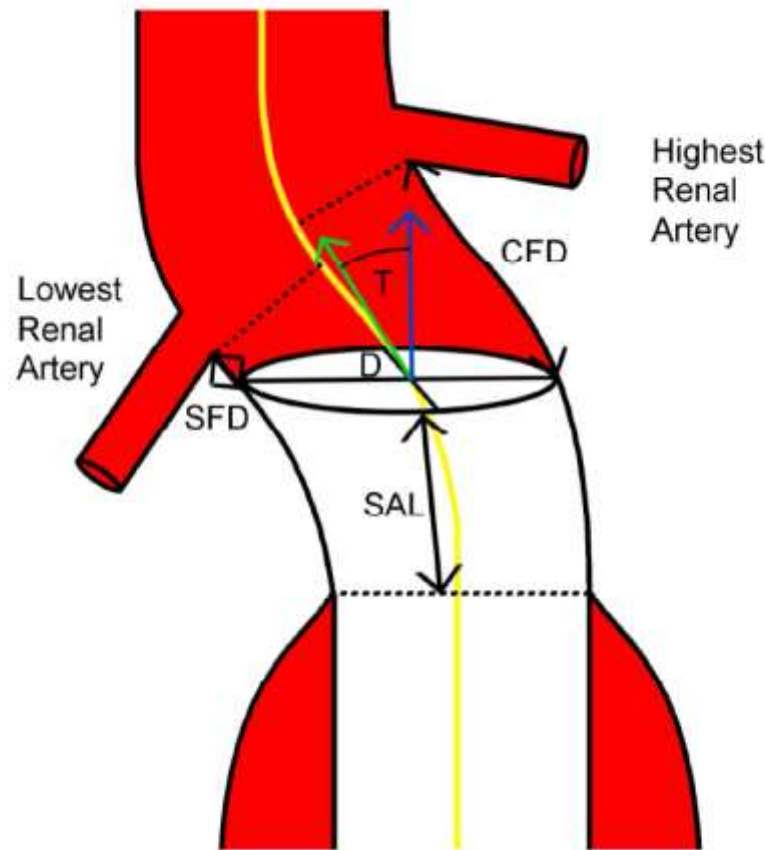


Figure 3.—The shortest apposition length (black line) is the shortest length between the proximal end of the endograft fabric (PEF, yellow line) and the DAB (red line).

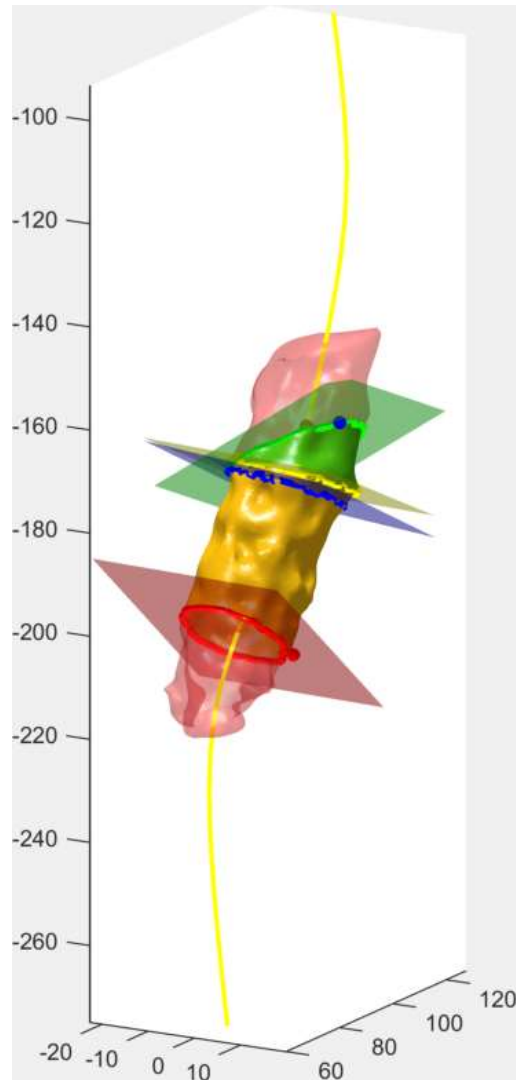
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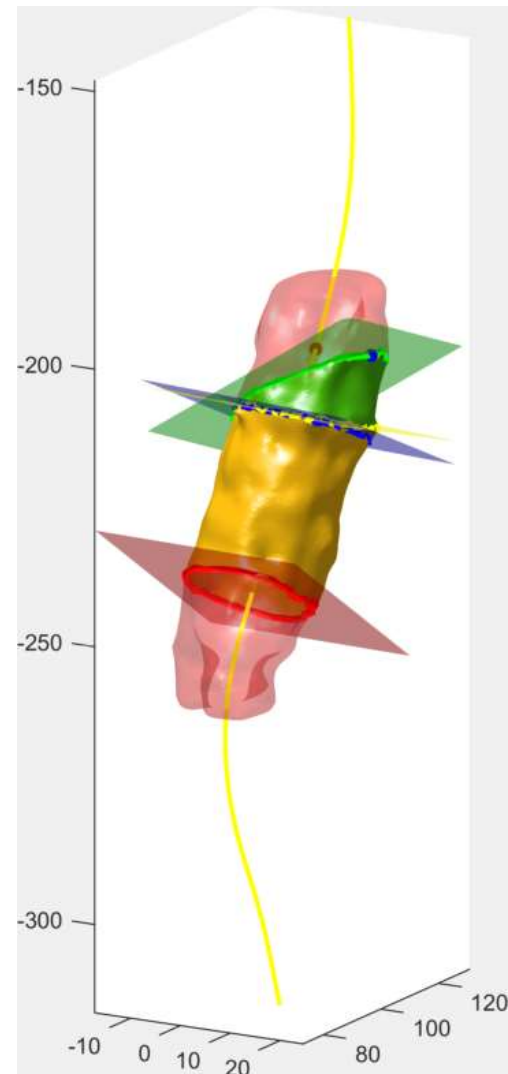
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Perfect apposition and no change during FU



1 month post-EVAR



1 year post-EVAR

Endograft migration and dilatation during FU

S3010, Pre



S3010, FU1



S3010, FU2



S3010, FU3



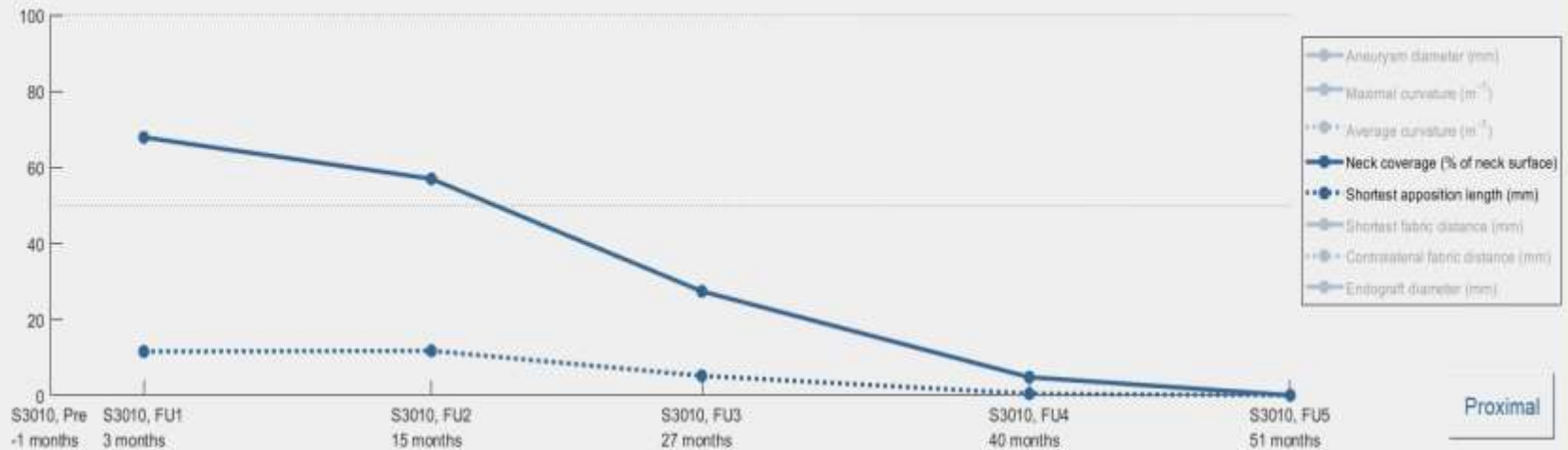
S3010, FU4



S3010, FU5



Endoleak



Endograft migration and dilatation during FU

S3010, Pre



S3010, FU1



S3010, FU2



S3010, FU3



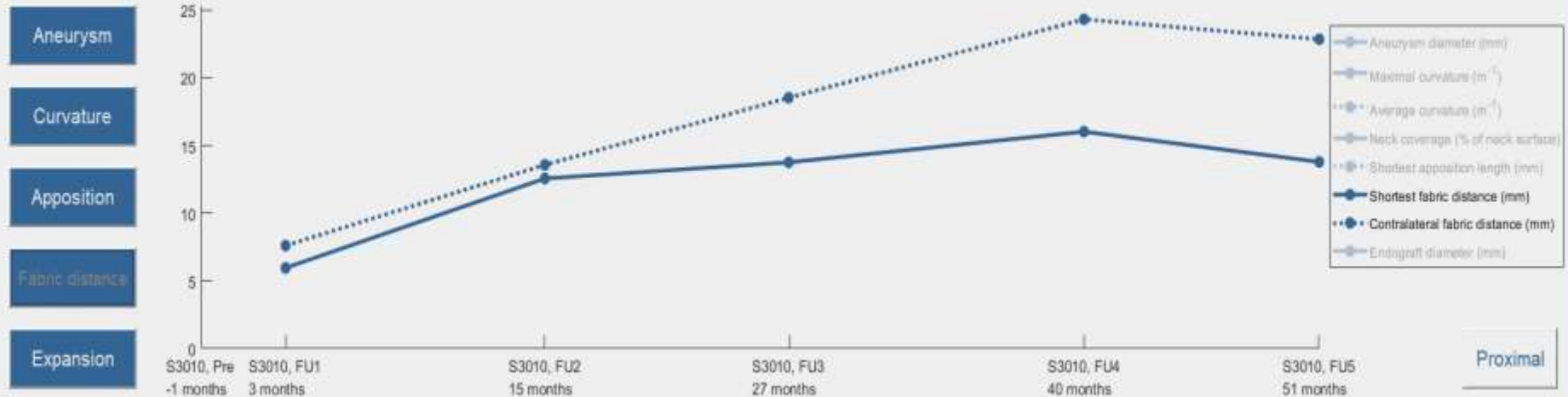
S3010, FU4



S3010, FU5



Endoleak



Endograft migration and dilatation during FU



Determination of Endograft Apposition, Position, and Expansion in the Aortic Neck Predicts Type IA Endoleak and Migration After Endovascular Aneurysm Repair

Richte CL Schuurmann, Kim van Noort, Simon P Overeem, Ruben van Veen, Kenneth Ouriel, William D Jordan Jr, Bart E Muhs, Yannick W 't Mannetje, Michel MPJ Reijnen, Bram Fioole, Çağdaş Ünlü, Peter Brummel, Jean-Paul PM de Vries

Journal of Endovascular Therapy

Study design

- Four groups of elective EVAR patients

- Type IA endoleak n = 36
- Migration (>10 mm) n = 9
- Type II endoleak n = 16
- Controls n = 37

- Software analyse

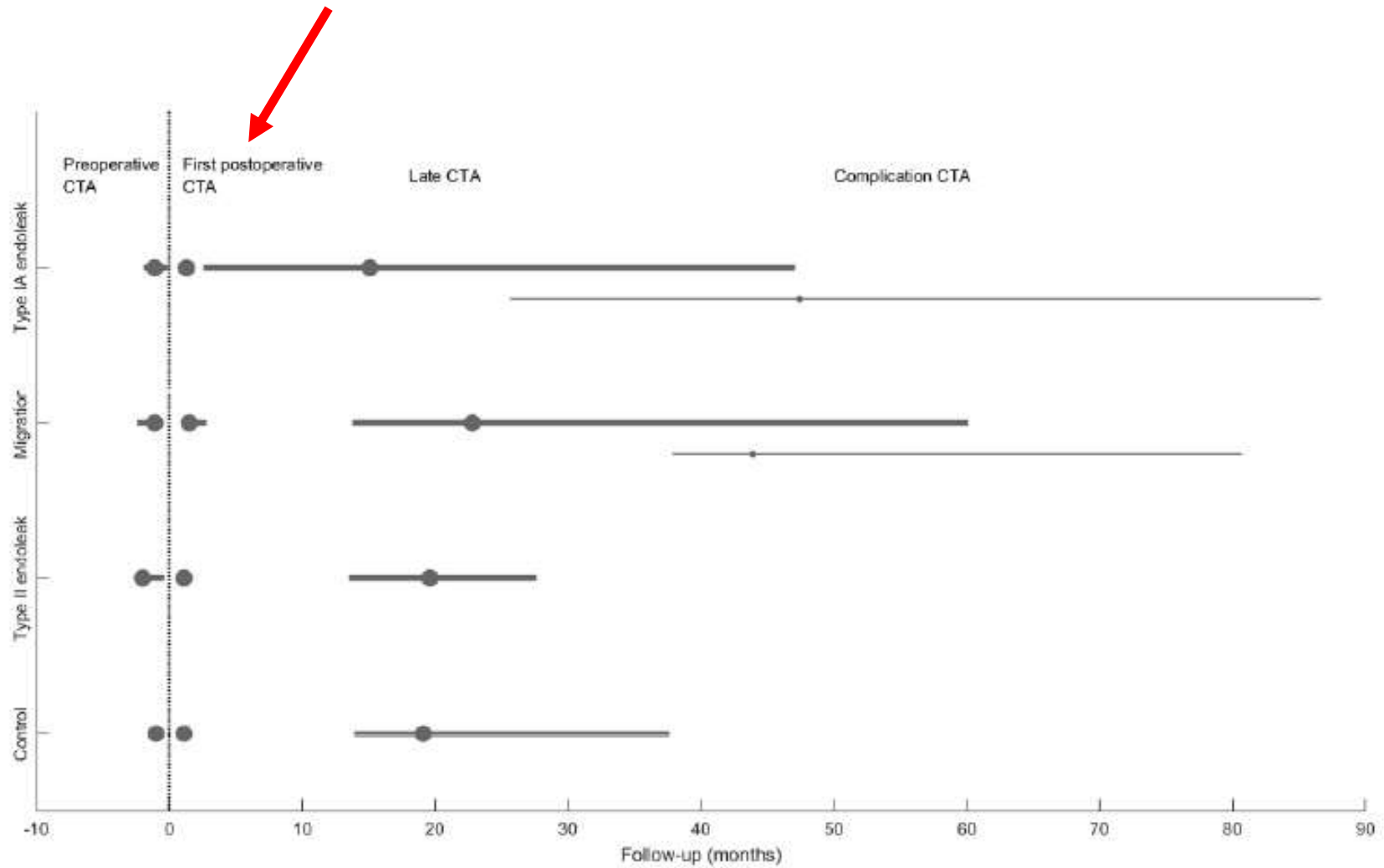
- endograft dimensions/ aortic neck measurements

- First post-EVAR CTA (1 month)

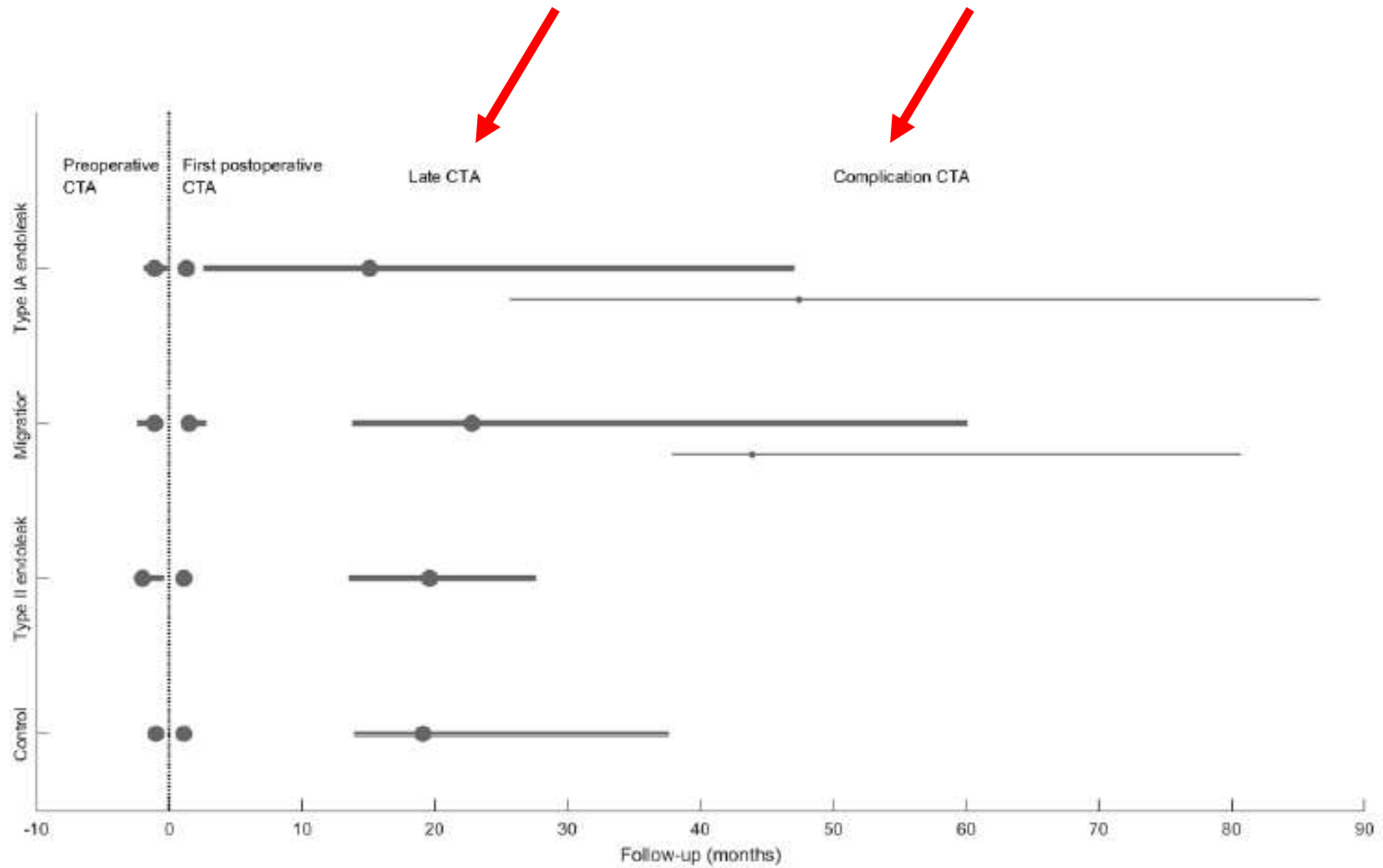
AND

- CTA scan before complication (*type IA & migration*); or
- Late (>1 year) CTA scan (*type II & controls*)

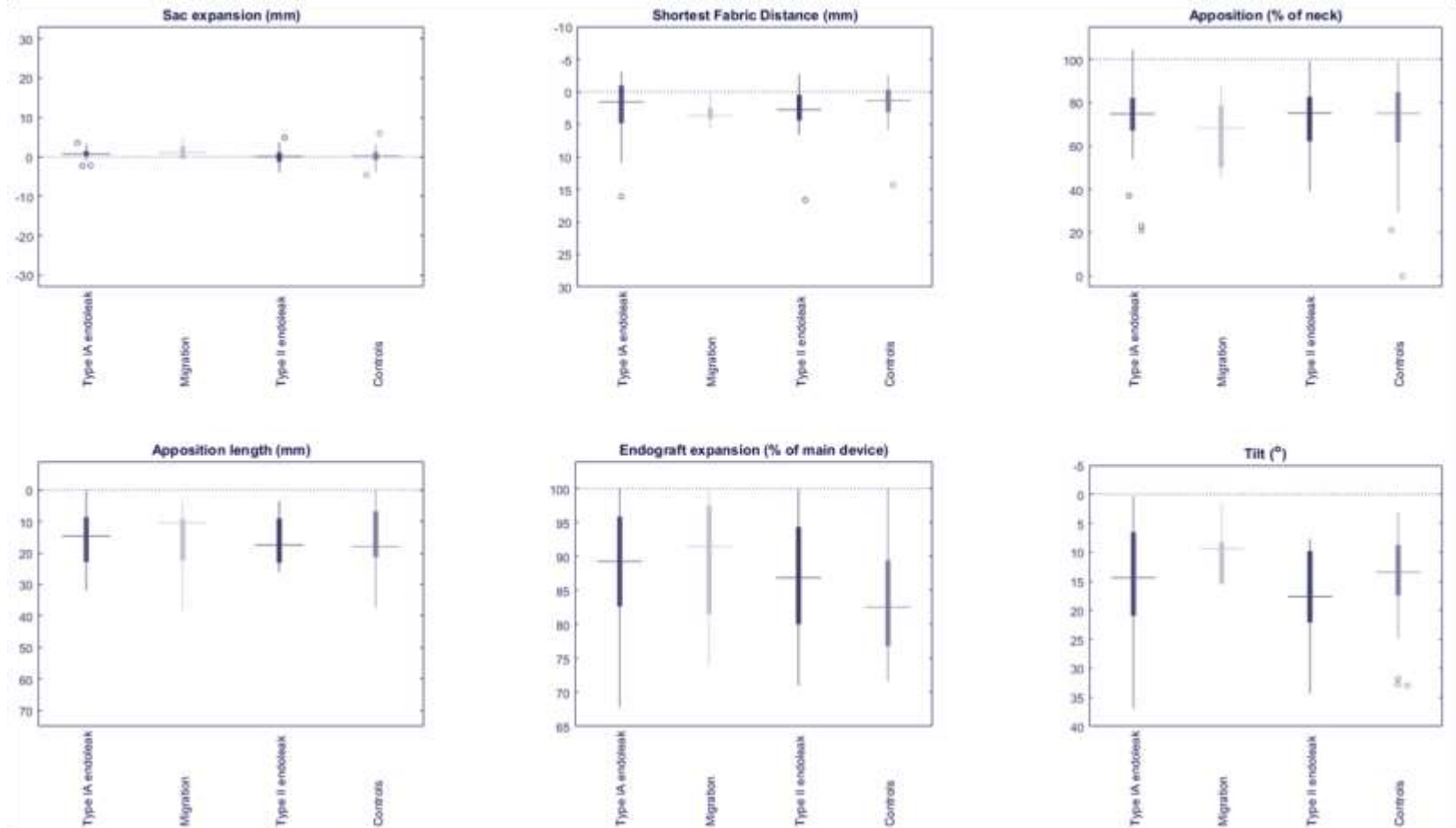
Study design



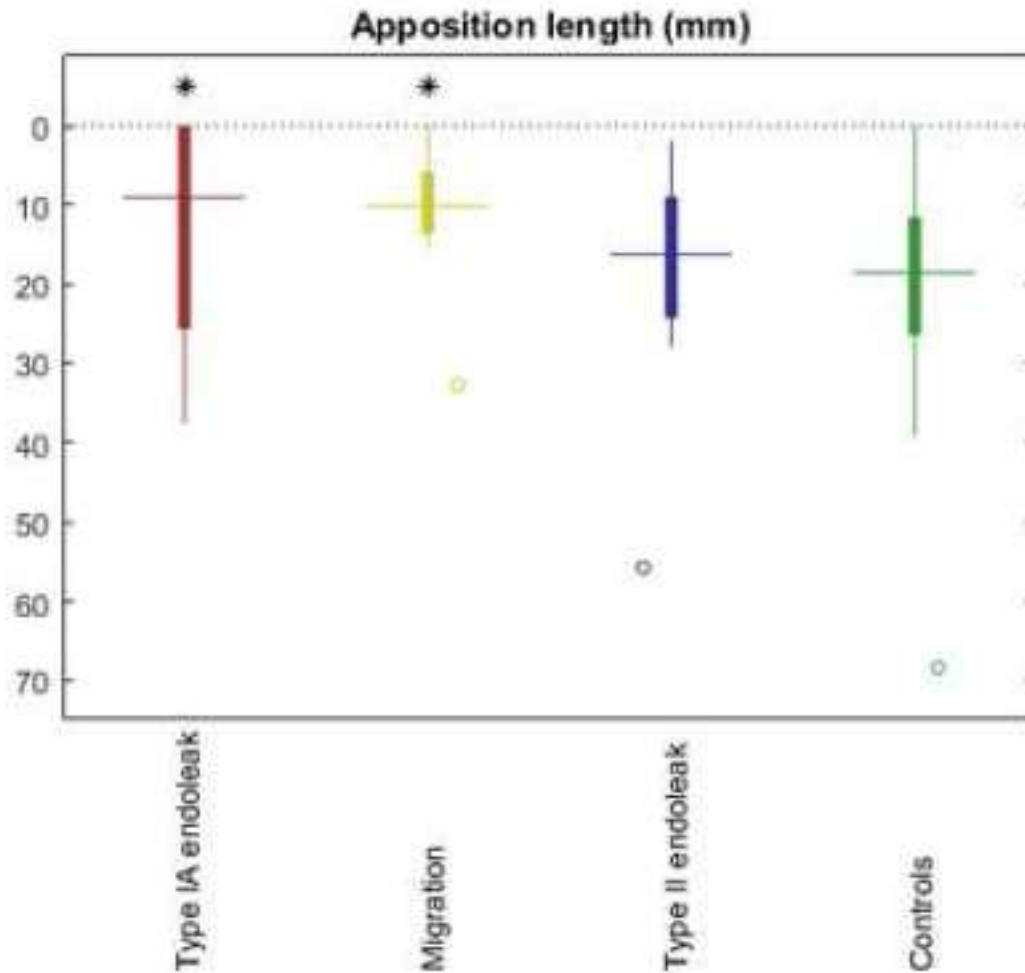
Study design



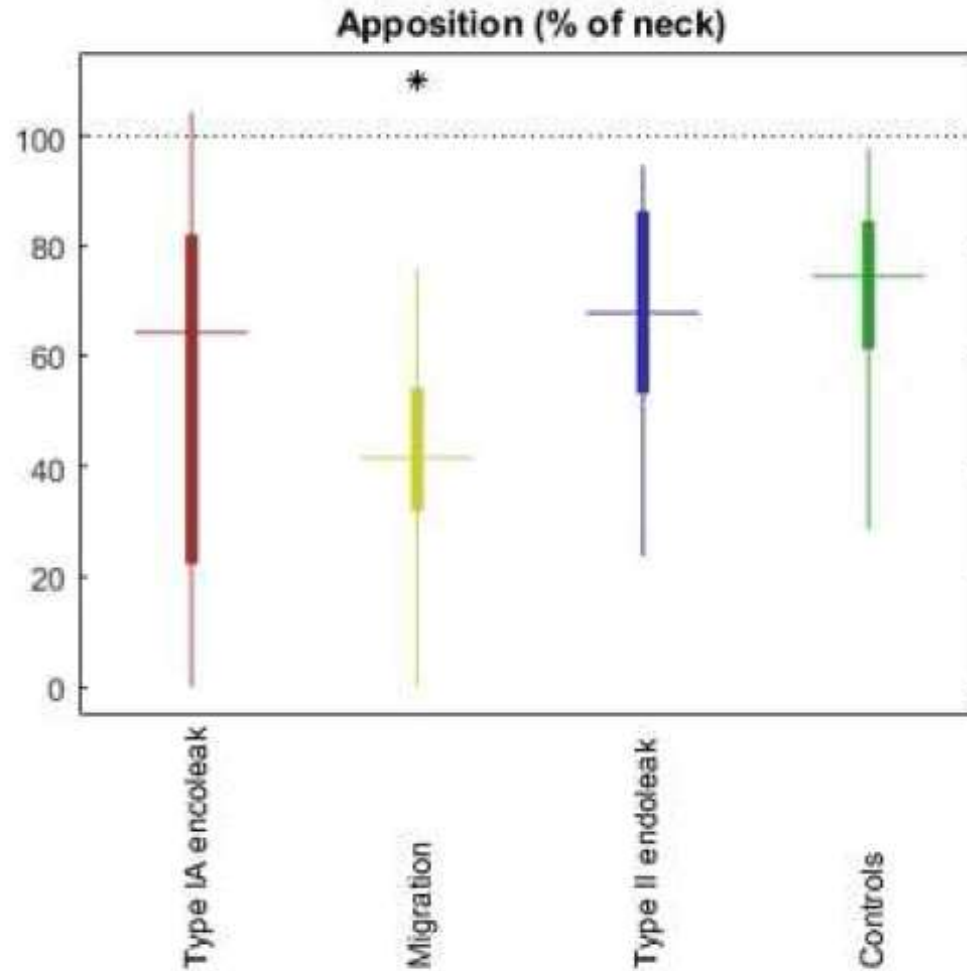
1 month CT (no differences)



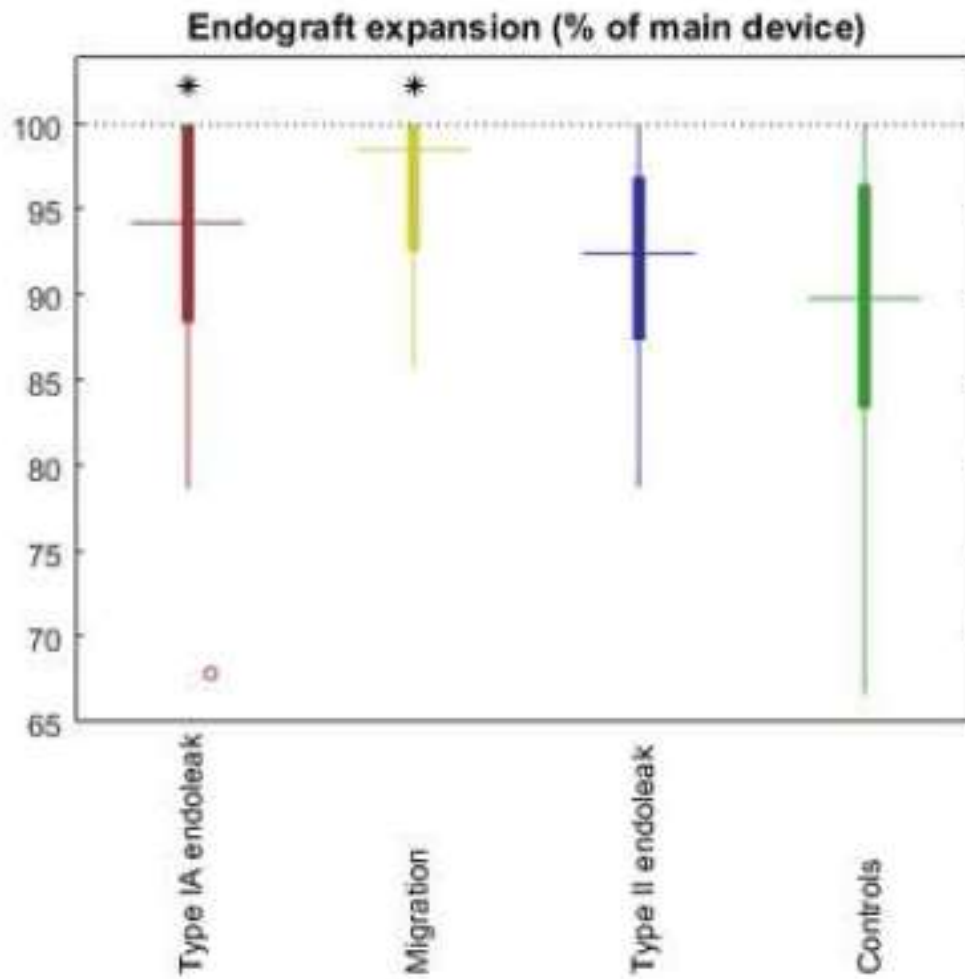
Apposition length (CT scan *before* complication)



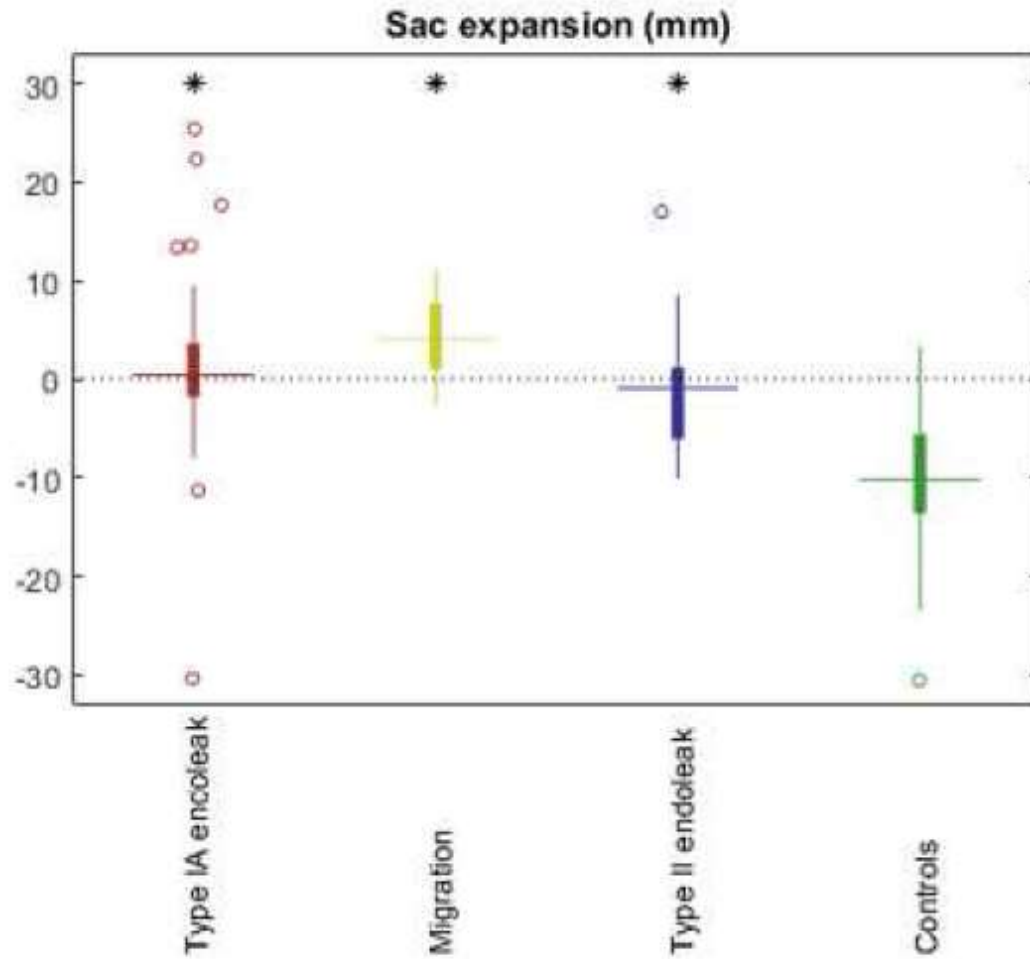
Apposition % neck (CT scan *before* complication)



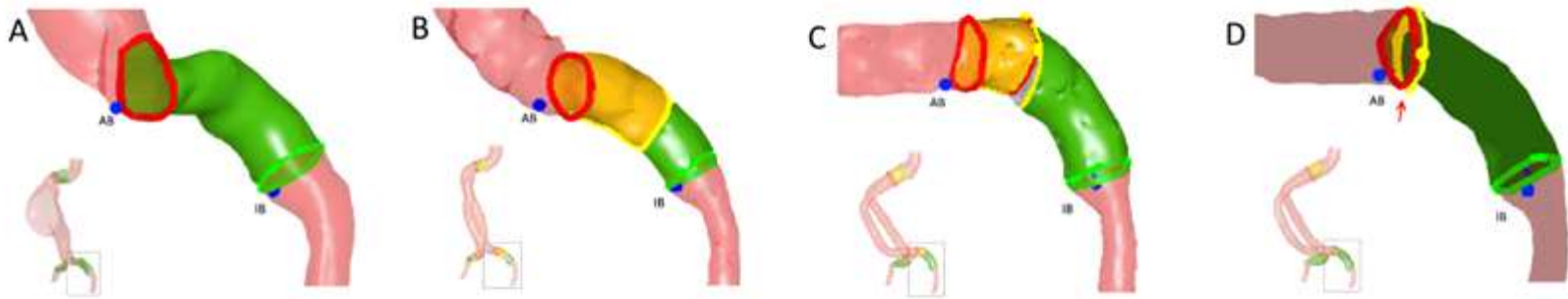
Endograft expansion (CT scan *before* complication)



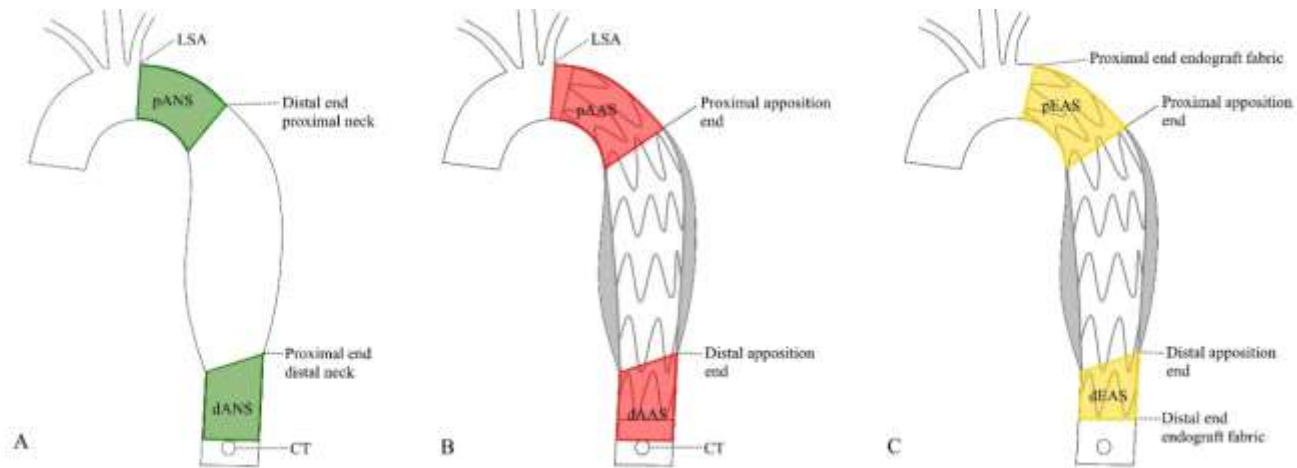
AAA sac expansion (CT scan *before* complication)



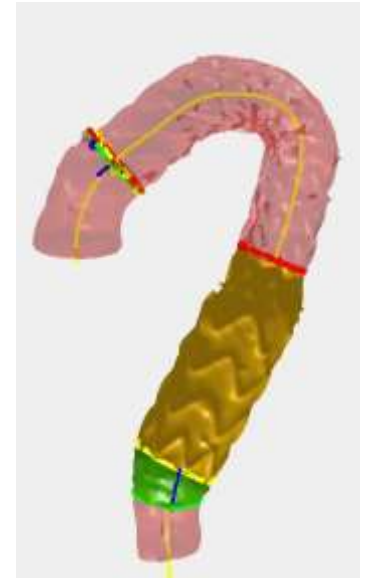
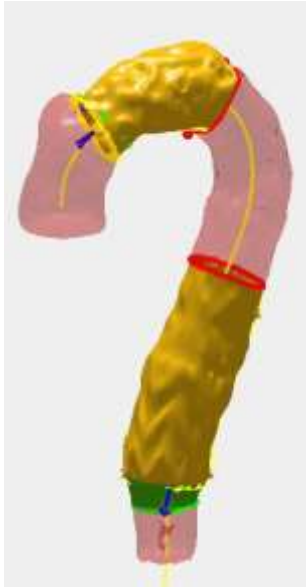
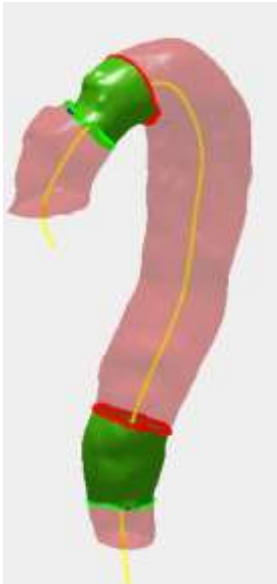
Other applications (work in progress)



Other applications (work in progress)



Other applications (work in progress)



Conclusions

- Detailed determination of position, and apposition of endograft / chimney grafts in the aortic neck on regular postoperative CTA scans is feasible with new VIA software.
- Early detection of morphological neck changes may prevent disastrous complications, and can make reinterventions less invasive.
- Today, a part of the early morphological changes will be missed with standard CT (reports)

Conclusions

- Certification of the software mandatory
- Thoracic and iliac applications are explored