Changes in AAA neck morphology after standard EVAR, CHEVAR, and FEVAR. There are differences and why

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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
Software

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

Changes in apposition during follow-up

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 analysis
  - Endograft dimensions/aortic neck measurements
    - First post-EVAR CTA (1 month)
    - Late (1+ year) CTA scan (Type II & controls)

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

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

Study design

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)

Endovascular aneurysm sealing (EVAS)

Challenging to define the apposition in the neck (endobags)
Non-apposition surface post ch-EVAS

Different types of displacement

Changes in stent geometry post ch-EVAS
Changes in stent geometry post ch-EVAS (6 months)

Changes in stent geometry post ch-EVAS (1 year)

Changes in stent geometry post ch-EVAS (18 months)

Study design

- 20 ch-EVAS patients with 1 year CTA FU
  - Type IA endoleak n=5 (25%)
  - Type IB endoleak n=1 (5%)
  - 4 Chimney stentgraft occlusions (1 bilateral, 2 single)

Non apposition surface (n=20)

- 1 Month CTA: 20.1% of the aortic neck surface
- 1 Year CTA: 30.6% of the aortic neck surface
- Neck diameter didn’t change → migration

Nellix stentframes vs chimney grafts migration
Conclusions

- Detailed determination of position, and apposition of endograft / chimney grafts in the aortic neck on regular postoperative CTA scans is feasible with new 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).

Thank you for your attention and welcome to ESCYS 22-25 May 2019 in Groningen, The Netherlands!