Importance Of Endograft Tilt And Sealing In Angulated Aortic Necks: New Software To Predict It And What Can Be Done To Offset It

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Disclosures:
None

Angulation vs curvature

Angulation ≠ trajectory
Curvature = trajectory

Advantages of curvature (home made software)

Entire aortoiliac trajectory
Automatic calculation
Reference to renal artery

• 35 elective EVAR patients
• Suprarenal & infrarenal angulation + max curvature
• Pre-EVAR & 1-month follow-up CT-scans
• Two independent experienced observers

Validation

<table>
<thead>
<tr>
<th></th>
<th>Observer 1</th>
<th>Observer 2</th>
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<tbody>
<tr>
<td><strong>INFRARENAL CURVATURE</strong></td>
<td></td>
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</tr>
<tr>
<td>Pre-EVAR, γ (°)</td>
<td>.953*</td>
<td>.934*</td>
</tr>
<tr>
<td>Pre-EVAR, δ (°)</td>
<td>.865*</td>
<td>.939*</td>
</tr>
<tr>
<td>Post-EVAR, γ (°)</td>
<td>.958*</td>
<td>.961*</td>
</tr>
<tr>
<td>Post-EVAR, δ (°)</td>
<td>.902*</td>
<td>.932*</td>
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<tr>
<td><strong>INFRARENAL ANGULATION</strong></td>
<td></td>
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<tr>
<td>Pre-EVAR, α (°)</td>
<td>.521*</td>
<td>.711*</td>
</tr>
<tr>
<td>Pre-EVAR, β (°)</td>
<td>.410*</td>
<td>.651*</td>
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<td>Post-EVAR, α (°)</td>
<td>.737*</td>
<td>.431*</td>
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<td>.612*</td>
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Clinical proof

• Case-control study
• 143 elective EVAR patients
• 64 Intraoperative type IA endoleaks (ANCHOR) vs. 79 control patients
• Core lab analysis of preoperative CT-scans (Syntactx, New York)
Methods

- Curvature over 6 segments
- Other potential predictors:
  - Angulation
  - Tortuosity
  - Neck diameter
  - Calcification
  - Thrombus
  - Max aneurysm diameter

\* Logistic regression

Predictors for type IA endoleak

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<th>P value</th>
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No predictors for type IA endoleak

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Final regression model

Endograft apposition

- Current (CT) follow-up is not sufficient to calculate apposition
- (Slight) changes in apposition or tilt will be missed

Software to determine apposition / tilt
Conclusions

- Curvature instead of angulation is a (better) predictor for early type IA endoleaks
- Curvature can be automatically calculated over the entire aortoiliac trajectory
- New software allows exact calculation of the endograft apposition/tilt in the neck and small changes during FU
- Clinical benefit in early detection of failures is being examined

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  Syntactx, New York, USA
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  Vascular surgery, University of Alabama, USA
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  Yale School of Medicine, New Haven, USA