3D PRINTED AAA PHANTOMS GENERATED FROM CTA: HOW THEY CAN FACILITATE TRAINING IN AND PERFORMANCE OF COMPLEX AAA REPAIRS

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Aneurysm Anatomy

EVAR: 5 year Freedom from Reintervention

Endograft used within IFU parameters-85%
Endograft used outside IFU parameters-21%
(3 IFU parameters)

Abbruzzese, T et al, JVS, 2008

Disclosures

- None relevant

Objective

- Evaluate effectiveness of the 3D printed phantom of AAA for X-ray guided simulation in a flow model
  - As a training tool and
  - For planning of complex EVAR
Procedural steps were evaluated for:
- Treatment strategy deviation
- Failure mode analysis and prolonged discussion regarding device use

P1 Initial Treatment Plan

Impact Scoring Methodology

Critical Procedure Step
1. Aortic Bifurcation Access with 20 Fr Sheath
2. Fenestrated Endograft Placement
3. Fenestrated Endograft Deployment
4. Renal Artery Access
5. Renal Artery Stent Placement
6. Renal Artery Stent Deployment and Flaring
7. Access to contralateral limb
8. Sizing of iliac graft
9. Prevention of Endoleak with Overlay
10. Awareness and Control of All Concurrent Devices

Impact Scoring Methodology

Procedural steps were evaluated for:
- Treatment strategy deviation
- Failure mode analysis and prolonged discussion regarding device use

P1 Initial Treatment Plan

P2 Actions Performed During Simulated Operation

Impact Scoring Methodology

Procedural steps were evaluated for:
- Treatment strategy deviation
- Failure mode analysis and prolonged discussion regarding device use

P1 Initial Treatment Plan

P2 Actions Performed During Simulated Operation

P3 Actions Performed During Patient Operation

Patient Diagnostic Imaging - CTA
### Impact Scoring Results

<table>
<thead>
<tr>
<th>Critical Procedure Step</th>
<th>Scoring</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Access to 20 Fr Sheath</td>
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<tr>
<td>2. Fenestrated Endograft Placement</td>
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<tr>
<td>3. Fenestrated Endograft Deployment</td>
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<tr>
<td>4. Renal Artery Access</td>
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<td>5. Renal Artery Stent Placement</td>
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<td>6. Renal Artery Stent Deployment and Flaring</td>
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</tr>
<tr>
<td>7. Access to Contralateral Limb</td>
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<tr>
<td>8. Sizing of Iliac Graft</td>
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<tr>
<td>9. Prevention of Endoleak with Overlap</td>
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</tr>
<tr>
<td>10. Awareness and Control of All Concurrent Devices</td>
<td>0</td>
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</tr>
</tbody>
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**Total Score:** 7

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**Conclusions**

Successful fluoroscopy- guided simulation of a FEVAR procedure in a patient-specific phantom. Simulation is effective at planning for periprocedural challenges and complications. The model can be used for selection of appropriate graft material and should be used as a tool for planning and sharing information with the interventional team. The model is a new avenue to help in the planning of EVAR procedures.