Symposium: Successful strategies to reduce complications in endovascular procedures

Reduction of contrast medium by fusion imaging

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Disclosure

Speaker name:

................................................. G. Panuccio.............................................

I have the following potential conflicts of interest to report:

☐ Consulting

☐ Employment in industry

☐ Stockholder of a healthcare company

☐ Owner of a healthcare company

☒ Honoraria and Travel Cost: Siemens

☐ I do not have any potential conflict of interest
Background

Intraoperative C-arm cone-beam computed tomography in fenestrated/branched aortic endografting


Martijn L. Dijkstra, BA, Matthew J. Eagleton, MD, Roy K. Greenberg, MD, Tara Mastracci, MD, Adrian Hernandez, MD, PhD

Impact of Hybrid Rooms with Image Fusion on Radiation Exposure during Endovascular Aortic Repair

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Three-dimensional fusion computed tomography decreases radiation exposure, procedure time, and contrast use during fenestrated endovascular aortic repair

Presented at the Twenty-seventh Annual Meeting of the Florida Vascular Society, Palm Beach, Fla, May 8-11, 2014.

Michael M. McNally, MD, Salvatore T. Scalii, MD, Robert J. Feezor, MD, Daniel Neal, MS, Thomas S. Huber, MD, PhD, Adam W. Beck, MD
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# Intraoperative C-arm cone-beam computed tomography in fenestrated/branched aortic endografting

Martijn L. Dijkstra, BA, Matthew J. Eagleton, MD, Roy K. Greenberg, MD, Tara Mastracci, MD, and Adrian Hernandez, MD, PhD, Cleveland, Ohio

<table>
<thead>
<tr>
<th></th>
<th>CBCT fusion</th>
<th>Historical control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoro time (minutes)</td>
<td>Median (IQR)</td>
<td>81 (54-118)</td>
<td>90 (46-128)</td>
</tr>
<tr>
<td>Contrast dose (cc)</td>
<td>Median (IQR)</td>
<td>94 (72-131)</td>
<td>136 (96-199)</td>
</tr>
<tr>
<td>Radiation dose (mGy)</td>
<td>Median (IQR)</td>
<td>7 (4-12)</td>
<td>7 (5-10)</td>
</tr>
<tr>
<td>Operative time (minutes)</td>
<td>Median (IQR)</td>
<td>330 (273-522)</td>
<td>387 (290-477)</td>
</tr>
<tr>
<td>Technical success</td>
<td>N (%)</td>
<td>28 (85)</td>
<td>44 (90)</td>
</tr>
</tbody>
</table>

*(J Vasc Surg 2011;53:583-90)*
Münster Experience
since November 2012

Fusion Prototype 2D/3D Registration
MESH model

No additional Radiation Exposure needed
No additional contrast agent
Prototype: automatic fusion process

Preoperative phase
- CT Segmentation
- MESH Model generation
- Work Projections selection

Intraoperative phase
- 2D/3D Registration
Intraoperative Phase: Set up in the hybrid room
Intraoperative Phase: 2D/3D Registration

Angiogram in AP

RX Lateral Projection
Delivery and Alignment

- Take off CT
- Take off SMA
- Take off Renal Arteries
- CT bifurcation
Deployment
Vessel catheterization
Vessel catheterization
Mesh Model Vs Voxel Model
Automatic Device Detection & Correction

Distortion Correction of MESH model

before

after
From Juni 2014 to December 2014
25 Patients f&b EVAR

Fusion could be used in 92% of the patients

Automatic intraoperative Registration
40%

Registration correction
52%
Workflow for each target vessel

Classical

- 1 or more DSA of the target vessel
- Catheterization
- DSA - Graft selection
- Stentgraft Deployment
- Final DSA

Fusion Assisted

- Catheterization
- Stentgraft Deployment
- Final DSA
Role of the new Prototype

- Fusion simplify this complex procedure
- Less angiography
- No pre catheterization of the target vessel
- 2D/3D Registration simplify the workflow
- No Rotational Scanning
- Just 10mGy radiation exposure
- Overlapping MESH Model
- Reduce time to identify the targets
- Improve Image quality (noise reduction)
- More information for the operator
  - Projection, length assessment
- Distortion Correction

CA & Radiation Exposure

Accuracy
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