Short and medium term outcomes of controllable fenestrated TEVAR using PMSGs for aortic arch pathology

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Disclosure

Speaker name:

...Xiangchen Dai.................................................................

I have the following potential conflicts of interest to report:

Consulting

☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

I do not have any potential conflict of interest
Objective

To evaluate short and medium term outcomes of controllable fenestrated thoracic endovascular aortic repair (f-TEVAR) using physician modified stent-grafts (PMSGs) for aortic arch pathology
Methods

82 consecutive patients underwent controllable f-TEVAR by PMSGs for aortic arch pathology in TJMUGH from Nov.2015 to Nov. 2018, Pre-, intra- and postoperative clinical data were recorded and analysed retrospectively.
Preoperative Data

82 cases: 2015.11-2018.11

TAAD: 4 cases

TBAD: 49 cases

Aortic arch aneurysm (AAA): 9 cases

Decending aortic aneurysm (DAA): 6 cases

PAU: 9 cases

PAU+IMH: 3 cases

Transection: 1 case

Type Ia Endoleak post TEVAR: 1 case
### Preoperative Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean and percentage (n=82)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y)</td>
<td>57 (18-83)</td>
</tr>
<tr>
<td>Male</td>
<td>65 (79.3%)</td>
</tr>
<tr>
<td><strong>Comorbidities</strong></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>73 (89.0%)</td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td>27 (32.9%)</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>14 (17.1%)</td>
</tr>
<tr>
<td>PAOD</td>
<td>9 (11.0%)</td>
</tr>
<tr>
<td>Renal dysfunction</td>
<td>8 (9.8%)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>4 (4.9%)</td>
</tr>
<tr>
<td>COPD</td>
<td>3 (3.7%)</td>
</tr>
<tr>
<td>Marfan syndrome</td>
<td>1 (1.2%)</td>
</tr>
</tbody>
</table>
Intaroperative result

- 82 PMSGs were modified and deployed
- Mean duration for stent graft modification was 38.29 minutes (range 30-125 minutes)
- Auxiliary guide wire were added to all devices and posterior diameter-reducing ties were installed to all multiple fenestrated stent grafts except one Valiant endograft
Intaroperative result

- Covering part of PMSGs were anchored from Z0, Z1 and Z2 in 5, 11 and 66 patients respectively
Intaroperative result

- The technical success rate was 97.56%(80/82).
- 2 early single fenestration cases were misaligned and LSA revascularization were performed by chemney stent.
- An immediate type Ia endoleak caused by chemney TEVAR was sealed by coil.
Intraoperative mortality was 1.22% (1/96)

- One patient with triple small fenestrations died of sudden cardiac arrest intraoperatively after deployment of PMSG and all supra-aortic branch stents
Intaroperative result

- No obvious intaroperative type III endoleaks
- No RTAD
- No transfer to open surgery
- All supraaortic trunk are patent
30 days Results

- No more patients died
- No stroke or paraplegia with permanent sequelae
- One type III endoleak occurred in a patient of Z2 group postoperative 7 days and was sealed by occluder
Follow up Results

• 81 patients were followed-up at mean 16.1 (range 1–36) months
• 2 additional patient died of non-aortic cause of death and overall mortality was 3.66%
  • Cardiac arrest 1 case (PO 4m)
  • Renal failure 1 case (PO 17m)
• All supra aortic trunks are patent without fenestration-related type I or III endoleaks
Follow up Results

One Retrograde type A dissection occurred in Z0 group postoperative 40 days and repaired by open surgery
Discussion
Advantage of f-TEVAR

- Less invasive
- Prolong healthy sealing zone
- No gutter
Most difficult problem

- How to deploy endograft accurately and controllable
  - Confirming tangent position
  - Adding auxiliary guide wire
  - Installing size reducing ties
Key role of auxiliary guide wire
Key role of size reducing tie
Conclusions

• Controllable f-TEVAR by PMSG for aortic arch pathology is both feasible and effective
• Auxiliary guide wires and diameter-reducing ties are the most important safeguard of controllable alignment
• Durability concerns will need to be assessed in additional studies with long term follow up
Thanks for your attention!
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