Focus on solutions for aortic arch aneurysms: The optimal endovascular treatment of complex aortic arch aneurysms from simple scalloped to triple branch devices

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Disclosure

Speaker name:
…Piotr Szopiński…

I have the following potential conflicts of interest to report:

☑ Consulting: Terumo Aortic, Artivion. Endologix
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

☐ I do not have any potential conflict of interest
Endovascular Treatment for Complex Thoracic Aortic Disease - my experience

• January 2018 – June 2023
• **22 patients** (19M, 3F), age 42-71 years

• Aortic arch aneurysms:
  - 14 isolated aortic arch aneurysms (9 true, 5 false)
  - 6 true aneurysms of aortic arch and descending aorta
  - 2 dissecting aneurysms involving the LCCA, LSA, thoracoabdominal aorta and iliac arteries
Implanted devices:

- 4 thoracic stent-grafts (2x Zenith, 1x Evita, 1x TAG)
- 2 stent-grafts with chimneys
- 18 CMDs based on Relay platform
  - 3x proximal scallop
  - 2x fenestration
  - 4x scallop + fenestration
  - 6x double branch
  - 3x triple branch
- 2x supraaortic debranching
- 10x LSA occluded with Amplatzer
Results (2)

- 22/22 successful aneurysm exclusion
- 2 deaths
  1. after 6 weeks pulmonary embolism after COVID-19 – Double branch
  2. on 3rd postoperative day due to heart rupture (the right atrium) – Triple branch

- 20/22 in FU
- late complications:
  - 1x stent-graft dislocation in BCT (reconnected with aditional stent-graft) – Double branch
  - 1x stent-graft occlusion LCCA – without intervention – asymptomatic – Double branch
CASE 1 – Fenestrated stent-graft + LSA occlusion

- 58 yo male
- Co-morbidities: hypertension, CAD

- Dg: Aortic arch aneurysm with Type B dissection, bovine arch
• Implantation of fenestrated stent-graft into aortic arch + thoracic stent-graft
• LSA occlusion with Amplatzer Vascular Plug

Control CTA after 3 months
CASE 2 – Stent-graft with scalop for LCCA and fenestration for LSA

- 45yo male
- Co-morbidities: COPD
- Dg: two false aneurysms of aortic arch
• Implantation of the stent-graft with scallop for LCCA and fenestration for LSA (balloon expandable stent-graft)
CASE 3 – Relay Double-branch system + carotid-subclavian by-pass

• 66yo male
• Co-morbidities: hypertension, CAD, COPD

• Dg: aortic arch aneurysm (91mm in diam.), RCCA aneurysm (35mm in diam.)
Relay Double - Branch system
- Implantation of Relay NBS plus into descending aorta
- Introduction of Custom Made Relay Thoracic Stent-graft into ascending aorta
- The LCCA-LSA by-pass with ligation of proximal part of subclavian artery
- Operation on RICA aneurysm – PTFE bypass
CASE 4 – Relay Triple-branch system

- 60 yo female
- Co-morbidities: hypertension, CAD
- H/o: 2015 - bifurcated prosthesis for AAA

- Dg: aortic arch aneurysm (54mm in diam.), aneurysm of descending aorta (73mm in diam.)
Relay Triple-branch system
Control CT after 6 months
### Do we need a triple branch device?

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<th>Single stage endovascular procedure</th>
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<td>• High risk patient generally treated</td>
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<td>• Lower operative risk</td>
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<th>Additional surgical manoeuvre avoided</th>
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<td>• Vessel damage</td>
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<td>• Phrenic and vagal nerve damage</td>
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<td>• Thrombus dislodgement into the brain</td>
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<td>• Creating scar tissue</td>
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<td>• Potential occlusion of the bypass</td>
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<th>Endovascular revascularization of the LSA during the procedure</th>
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<td>• No need of additional anaesthesia</td>
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<td>• Avoiding surgical injury to surrounding structures (such as nerves and lymphatics)</td>
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<th>Preserved access from the LSA to the descending aorta</th>
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<td>• Potential future interventions to treat other aortic pathologies</td>
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Summary

• Aortic arch is still a battlefield between open and endovascular procedures.

• Availability of endovascular devices dedicated for the treatment of aortic arch lesions is still limited, therefore in cases with complex anatomy the operator is pressed to be very flexible in choosing the treatment option.

• These procedures should be limited to select expert centers where the design and deployment procedure of branched endografts can be further developed to reduce stroke risks.
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