

Total endovascular aortic arch replacement with chimney/sandwich techniques

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Disclosure

Speaker name: **Gabriela Teixeira**

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)

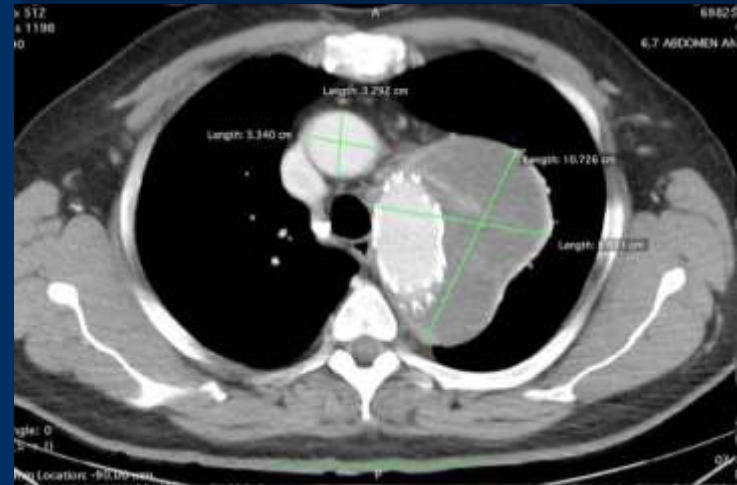
- I do not have any potential conflict of interest

Introduction

- Traditional open replacement of the aortic arch (zone 0) is one of the most complex, challenging and demanding operative procedures in cardiovascular surgery;
- Significant morbidity (30-40%) and mortality (8-20%), permanent neurologic sequelae and renal failure requiring hemodialysis are some of the adverse outcomes reported in literature.

CLINICAL CASE

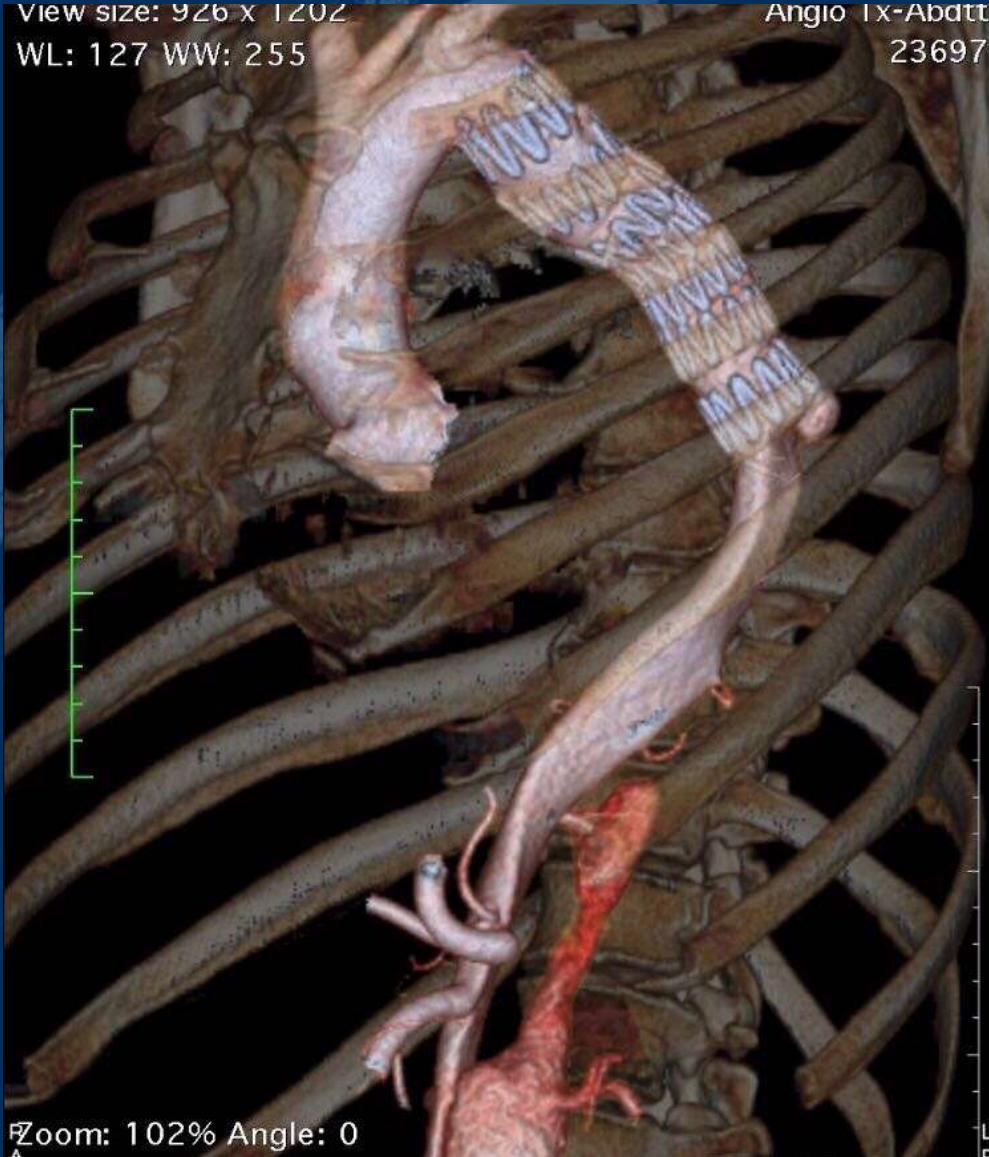
- 48 year-old male;
- Stanford type B aortic dissection with thoracic aneurysmal dilatation of the false lumen;
- Presenting with thoracic pain;
- Previous medical history included hypertension under control with 3 medications;
- An unsuccessful TEVAR, with a thoracic stent-graft placed immediately after the ostia of the left subclavian artery (TX2®), performed in another service (2015) and complicated with EL Ia.



- The admission Angio CT revealed type Ia and Ib endoleaks, in addition to sac expansion (100mm) and partial false lumen thrombosis.

View size: 926 X 1202
WL: 127 WW: 255

Angio 1x-Abdtt
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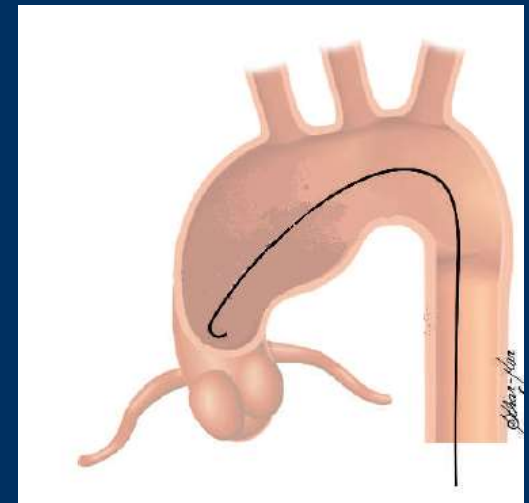
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There was no
enough proximal
aneurysmal neck
to achieve
exclusion of the
aneurysm.

We proposed to reconstruct the aortic arch, in an exclusively endovascular surgery, and extending TEVAR proximally to Zone 0 with chimney/sandwich techniques:

1. Extend TEVAR distally to ensure “healthy” run-off;
2. Left subclavian artery endorevascularization with periscope sandwich technique ;
3. Endorevascularization of brachiocephalic trunk and left carotid with parallel chimney graft technique;
4. Extend TEVAR proximally to Zone 0.

- Patient preparation: antibiotic prophylaxis, urinary catheter placement, central venous access, arterial line, temporary pacemaker implantation;
- General anesthesia;
- Surgical approach of right femoral artery, both axillary arteries and left common carotid artery. Percutaneous access of left femoral artery;
- 12-Fr sheaths were introduced through both axillary and left common carotid artery;
- Introduction of a diagnostic pigtail catheter in the aorta, through the left common femoral artery;
- Placement of an hydrophilic stiff guidewires, 0.035 mm, into the ascending aorta, through right femoral artery access;



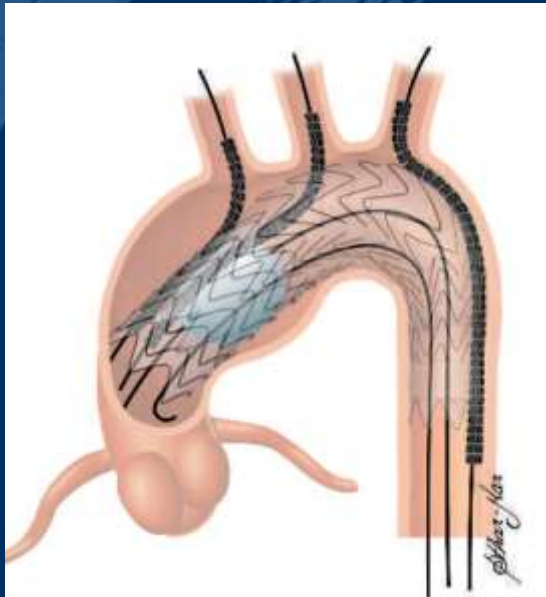
- Inserted a thoracic stent-graft (Gore® C-TAG® 34mm) through the right femoral artery access. Placed and deployed the proximal end just 1cm below LSA origin;



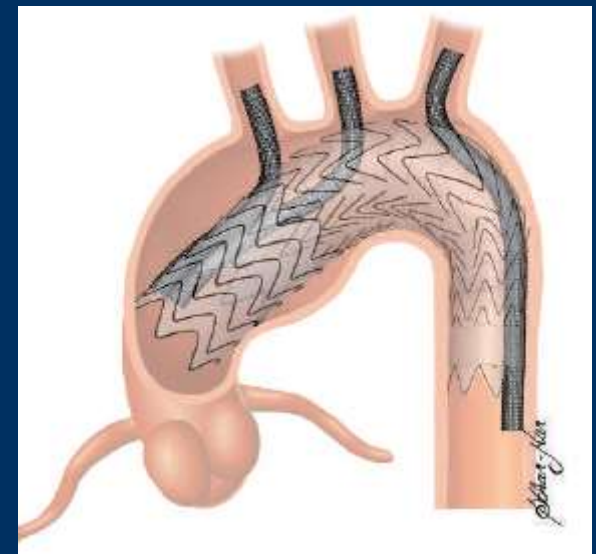
- Introduced a second thoracic stent-graft (Gore C-TAG® 40x200mm) and placed the proximal end in just above the coronary artery ostia;



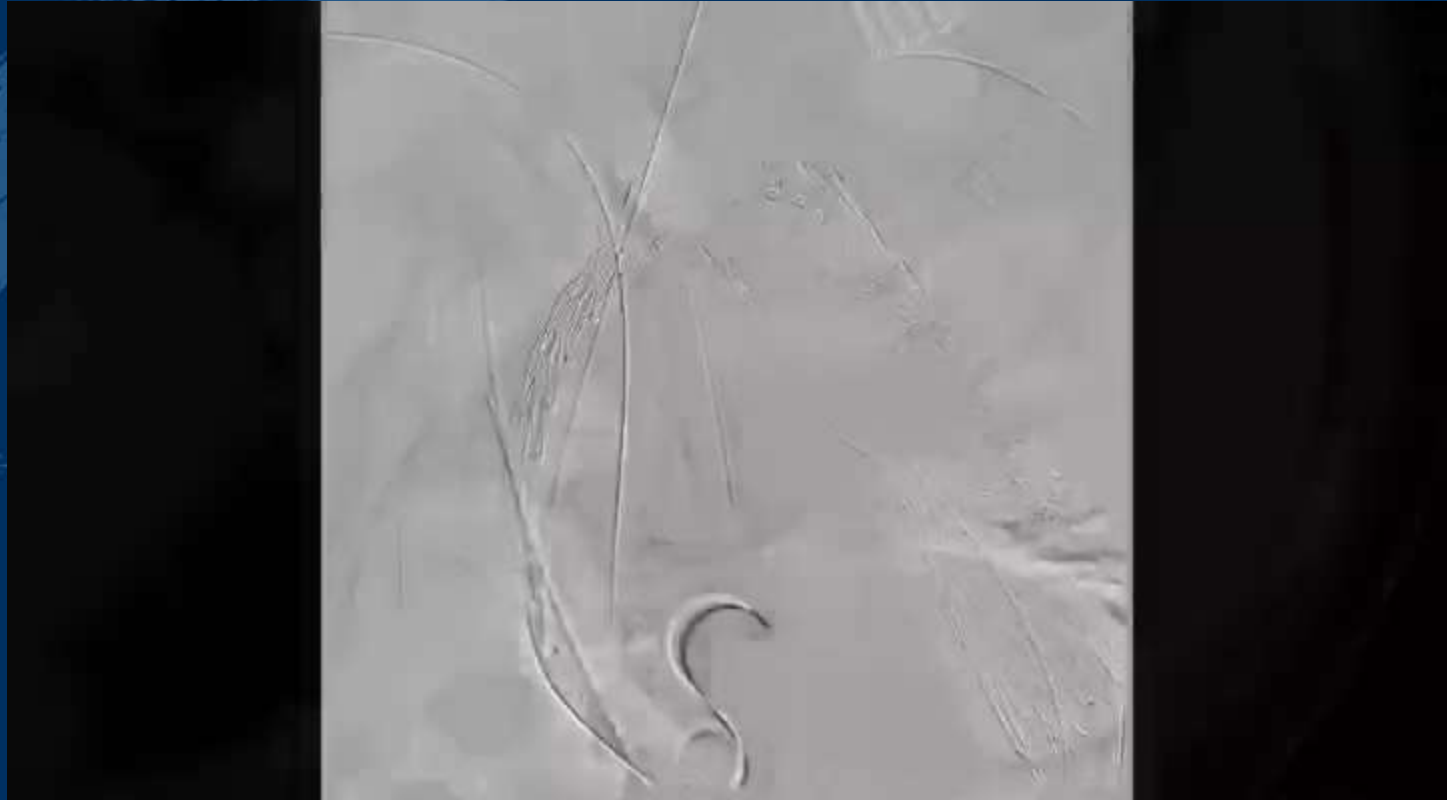
- Positioned of ViaBahn® grafts (13x100mm and 8x100mm) through right brachiocephalic and left common carotid arteries, respectively, in a retrograde fashion, with distal tip close to the sinutubular junction;
- Placement of a third ViaBahn® graft (13x100mm) into left subclavian artery, with distal tip into thoracic aortic (periscope graft);

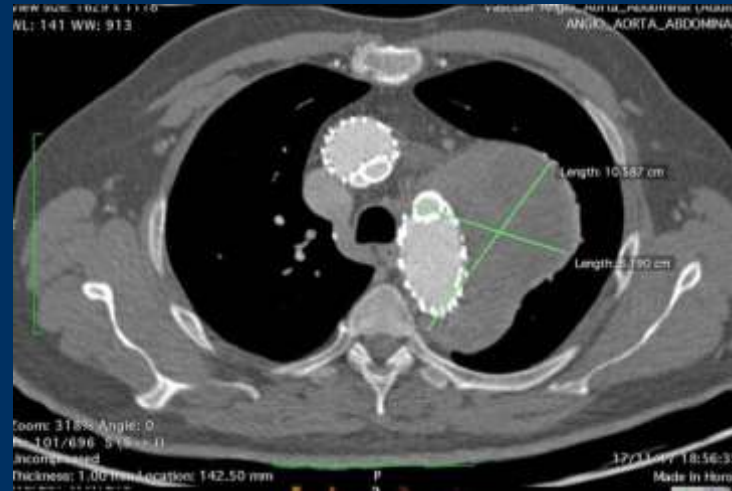


- Deployed and accommodated the second thoracic stent-graft using a latex balloon (Gore® Tri-Lobe Balloon Catheter);



- At last, deployed the 3 covered stents.





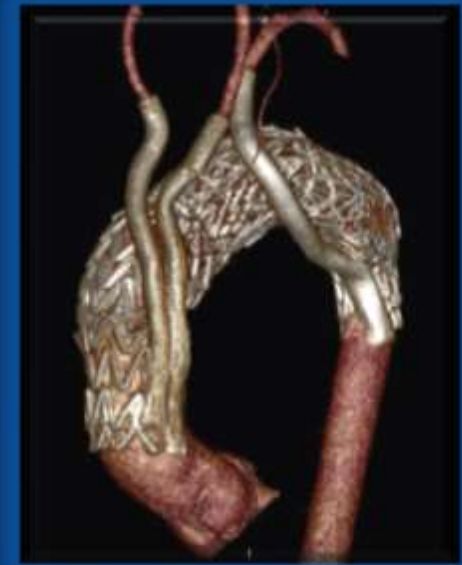


Materials needed: 2 thoracic stent graft, 3 self-expanding stents, 1 latex balloon, 5 introducers, 4 guide wires, 1 diagnostic catheter

- Easier execution than as fenestrated thoracic stent grafts
 - Shorter intervention time
 - Cheaper
- It may be performed even in cases of previous TEVAR or open surgery
 - Can be used in an urgent setting

How to avoid gutters

- Use flexible stent grafts;
- Implant as proximal as possible the thoracic stent graft;
- Oversize the thoracic sent graft by 30%;
- Prefer self-expanding branches;
- Use coated stents;
- Consider strengthening with internal auto-expansible stents;
- Oversize the branches by 20%;
- Implant the branches as distal as possible within the supra aortic trunks.





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- From October 2010 to May 2017: 20 patients (18 men), mean age 60.4 years, underwent total endovascular reconstruction of the aortic arch (zone 0);
- Follow up: $19,4 \pm 8,3$ months;
- Primary patency rate: 91%;
- 30-day endoleak rate (20%):
 - Two type I: successfully managed during the procedure with the deployment of a thoracic endograft;
 - Two type II: sealed spontaneously after a 30-day CT scan.



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- Late endoleak rate (10%):
 - Two type III: effectively treated with a second thoracic stent graft deployed after three months
- 30-day survival rate (90%):
 - 2 patients died from complications related to an ischemic myocardial infarction.
- Late mortality rate (20%):
 - 1 procedure-related (5%): previous aortoesophageal fistula died from pulmonary complications;
 - 3 non-procedure-related (15%): elective open TAAA repair, myocardial infarction and lung cancer;



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- No conversion rate;
- No spinal cord ischemia rate;
- Minor stroke (5%), complete recovered in 2 days.

Conclusion

- Total endovascular zone 0 replacement of the aortic arch with the chimney/sandwich techniques as described by **Lobato AC** et al in 2011 is a feasible less invasive, demanding and time-consuming option comparing to hybrid or traditional open replacement of the aortic arch, particularly in the urgent/ emergent settings.

The logo for LINC (Lusitana International Network for Cardiovascular) is located in the top left corner. It features the letters 'LINC' in a white, sans-serif font. To the left of the text is a stylized graphic consisting of two overlapping, curved lines in red and orange, set against a dark blue background.

LINC

Thank you

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