

TEVAR FOR ASCENDING AORTIC PATHOLOGIES: TIPS AND TRICKS

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Disclosure

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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

Disclosure

The angio videos and photos shown here are courtesy of Dr. Kölbel.

TEVAR for Ascending Aortic Pathologies

- TEVAR in the ascending aorta has been performed since 2000 and data about 119 patients worldwide had been published based on recent meta-analyses.
- Mortality (2.8-5.9%) and morbidity (stroke= 1.8-3.3%) seems to be acceptable with type 1 endoleak rate of 16.7-18.6%.

Case presentation

- 87 year old wheelchair-bound male with a long history of smoking on home oxygen
- Presented with chest pain from a nursing home
- Chronic renal insufficiency
- CT scan showed a large saccular aneurysm in the ascending aorta.
- High-risk for open surgery

Case presentation





Case presentation



General Guidelines

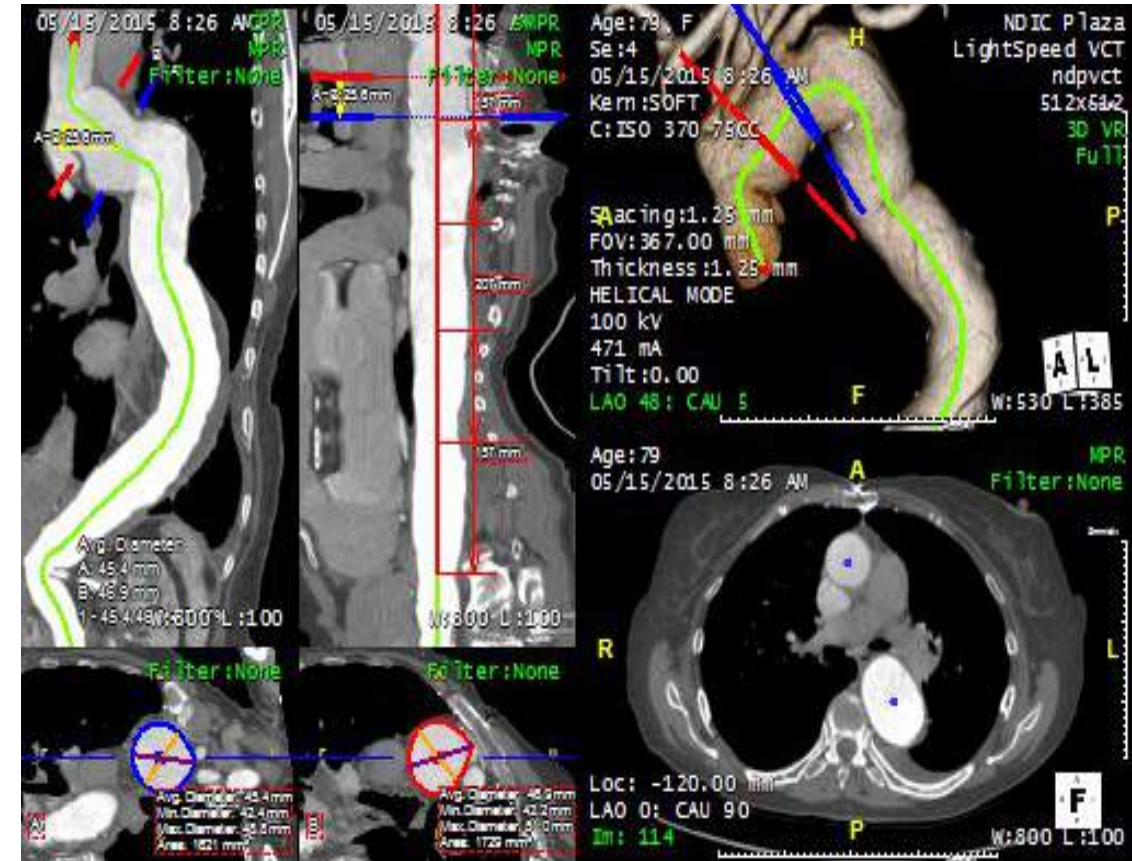
- Aortic diameter between 16mm and 44mm
- Distance between STJ and innominate (brachiocephalic) artery 6-10 cm.
- Landing zones > 1cm in the ascending aorta
- Entry tear more than 1cm above STJ and 0.5cm proximal to innominate artery

N Baikoussis *et al.* J Vasc Surg 2017; A Khoynzhad *et al.* J Vasc Surg 2016;63:1483-95

Tips and Tricks

Tip #1 Planning

- Good imaging is critical to success
- Only **EKG-gated** CT (1mm or less cuts) for measurement and determination of entry tear.
- **Repeat CT if outside CT not gated.**
- 3D reconstruction
 - TeraRecon or other software
 - Not only centerline measurement but greater curve and lesser curve



Tip #2 Approach

- Transfemoral
 - If device too short, can use iliac conduit.
- **TRANSAPICAL**
- Trans-subclavian/axillary
- Trans-carotid

Why TRANSAPICAL?

- Short distance to landing zones, better accuracy
- Useful for horizontal aorta, easier to be co-axial
- No need to worry about nose-cones causing ventricular rupture
- Nice for stent-grafts that have bare-stents
- Immediate true lumen access in dissection cases
- Able to drain pericardial blood
- Able to decompress heart for patients with severe AI

Tip #3 Transapical Approach

- Location: 5th or 6th intercostal space but use imaging to help
 - CT
 - Fluoro
 - TEE
 - Visualize LAD
- Large Teflon pledgets
- 2-0 or 3-0 sutures for 2 horizontal mattress sutures or pursestring
- Large needle (MH or SH)
- Use Rummels
- Tying under ventricular pacing
- Heparinization after sutures placed
- **Have an assistant hold on to sheath at all times and do not torque sheath**

Tip #4 Visualization

- IVUS- especially important for dissection to confirm true lumen access and also location of tears.
- TEE- Again to confirm true lumen access and also to check for valve function and pericardial effusion after the procedure.

Tip #5 Must cross the aortic valve

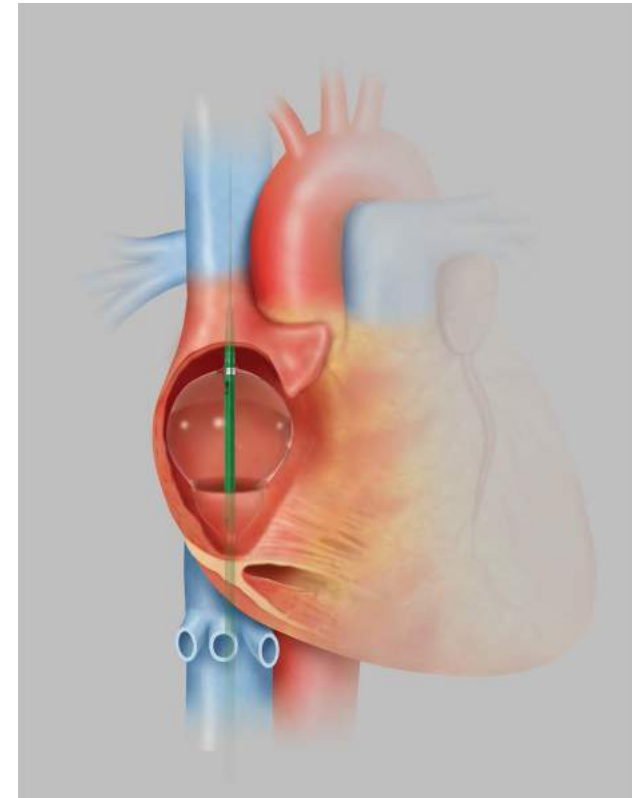
- For stability, the wire must cross the valve.
- Use pigtail to cross the valve or floppy type wire (if coming from femoral).
- If transfemoral, use double-curved Lunderquist or extended curved Lunderquist.
- If transapical, would use regular curved Lunderquist or Amplatz Superstiff. NO DOUBLE CURVED LUNDERQUIST.
- At end of procedure, make sure to remove wire across valve via exchange catheter to prevent damaging the valve.

Tip #6 Fixation

- Over-sizing
 - <10% for dissection
 - 20-30% for other pathologies

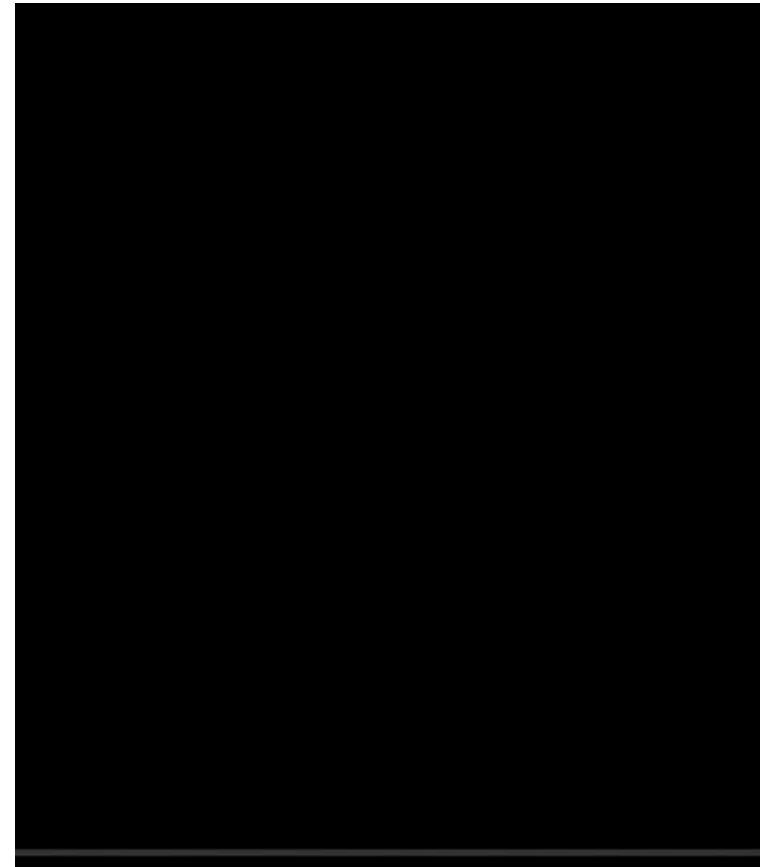
Tip #7 Positioning

- For more accurate positioning, must achieve minimal cardiac output
 - **Rapid pacing**
 - Inflow occlusion
 - Pharmacologic (adenosine)



Tip #8 Rapid pacing

- Rate 160-180
- Via femoral vein
- Must have defibrillation pads attached and connected
- Venous sheath can also be rapidly changed out for CPB cannula



Tip #9 Cardiopulmonary pump standby

- Especially in patient with severe AI, poor ventricular function
- Pump needs to be primed or “wet”
- Appropriate size cannulae in the room or on the table.

Summary

1. Planning- gated CT/3D reconstruction
2. Approach
3. Transapical
4. Visualization-IVUS/TEE
5. Crossing aortic valve
6. Fixation
7. Positioning
8. Rapid pacing
9. Cardiopulmonary bypass stand-by

QUESTIONS?



TEVAR for Ascending Aortic Pathologies

- It is important to note that there are no FDA approved ascending devices in the US.
- Ali Khoynzhad and Rodney White in LA have a PS-IDE with a medtronic Valiant device.
- Gore is conducting a type A dissection trial using an ascending device (aortic extensions from their TBE trial).
- Cook Ascend device which is available in Europe.
- Most of the devices used in the case series were physician modified or using currently available descending devices if the lengths are appropriate.

TEVAR for Ascending Aortic Pathologies

Brand	Diameter (mm)	Length (mm)	System-Length (mm)	Sheath-Diameter ID (F)
Cook Zenith TX2 ProForm	22-42	77-216	75	20-22
Medtronic Valiant Captivia	22-46	110-226	88	22-25
Gore CTAG	21-45	100-200	115	18-24
Bolton Relay	22-46	100-250	90 + x	22-24
Jotec Evita 3G	24-44	130-230	95	20-24