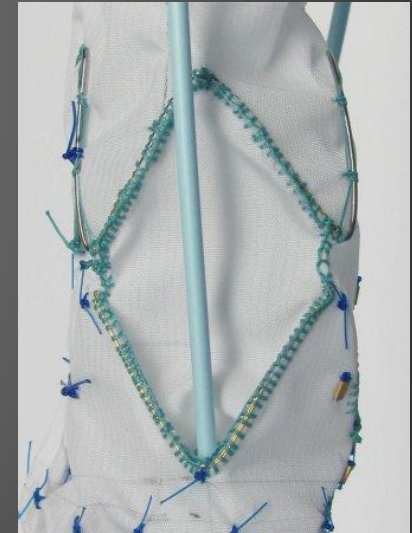
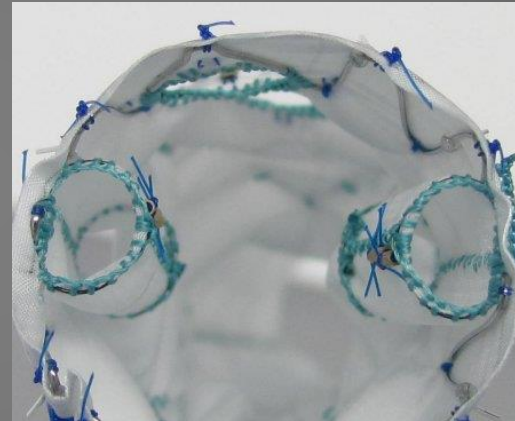


How to Avoid Trouble when Using Inner Branches



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Department of Vascular and Endovascular Surgery
Paracelsus Medical University, General Hospital Nuremberg, Germany

Disclosures

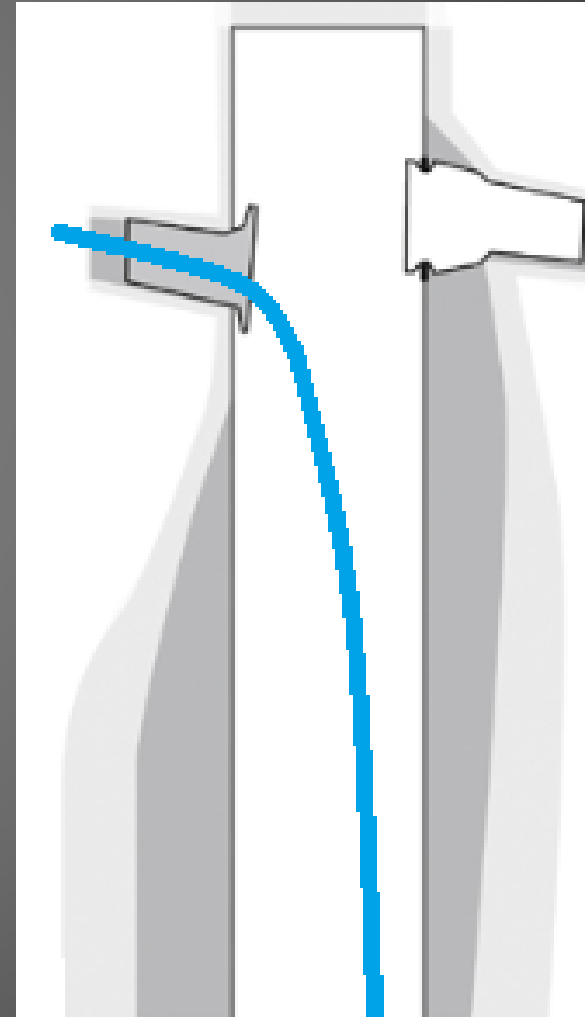
- Cook
 - Inner branches discussed in 2004
 - Arch
 - Visceral
- Bentley
- Getinge

Considerations

- Extra Option in Vessels less suitable to standard Branch or Fenestration
 - Tested in „ugly“ vessels?
- From „Hype“ to „Obsolete“?
 - Or only in strict indications/configurations?

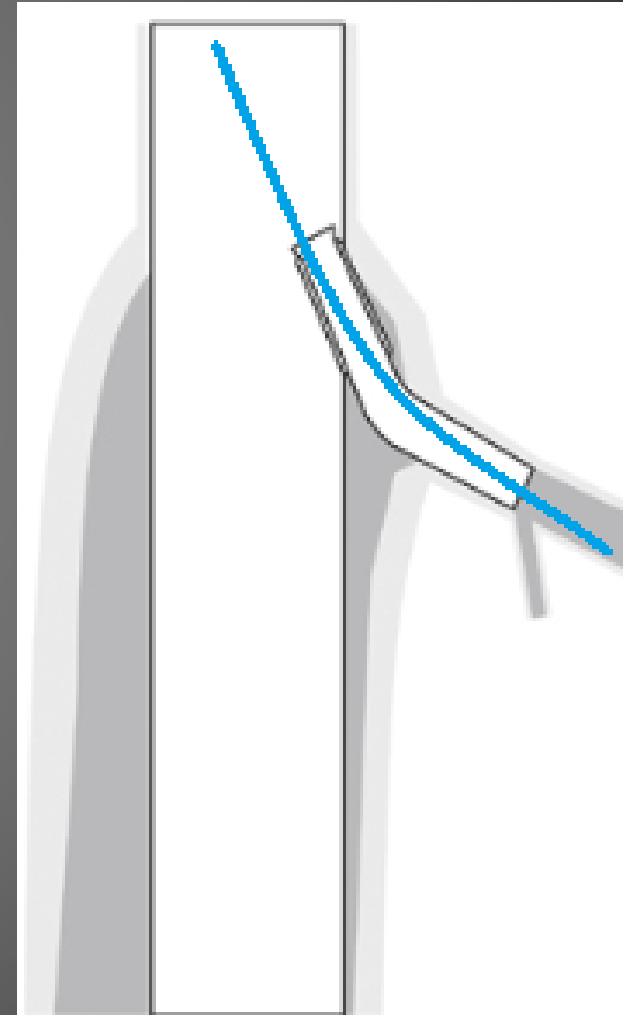
Fenestration

- 90 degree take-off
- Catheterisation from below
- Graft in contact/close to aortic wall



Branch

- Sharp take-off
- Catheterisation from above or below with steerable sheaths
- Enough space between graft and aortic wall



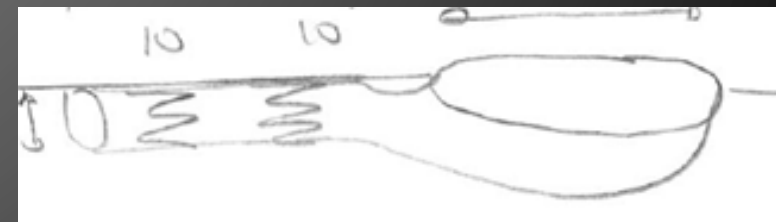
What to do with „less-suitable“ vessels?

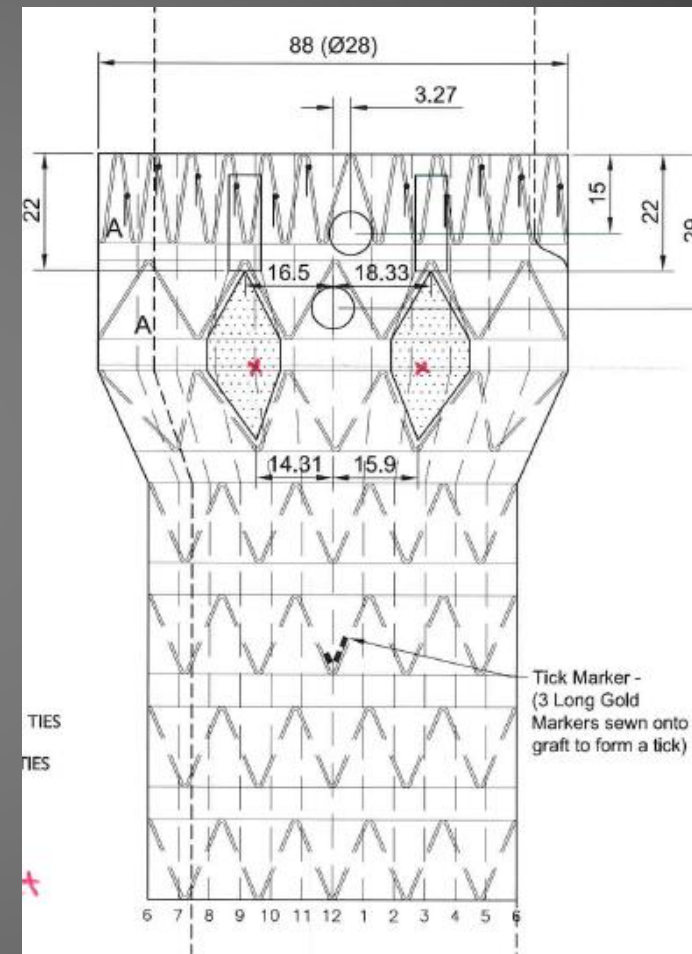
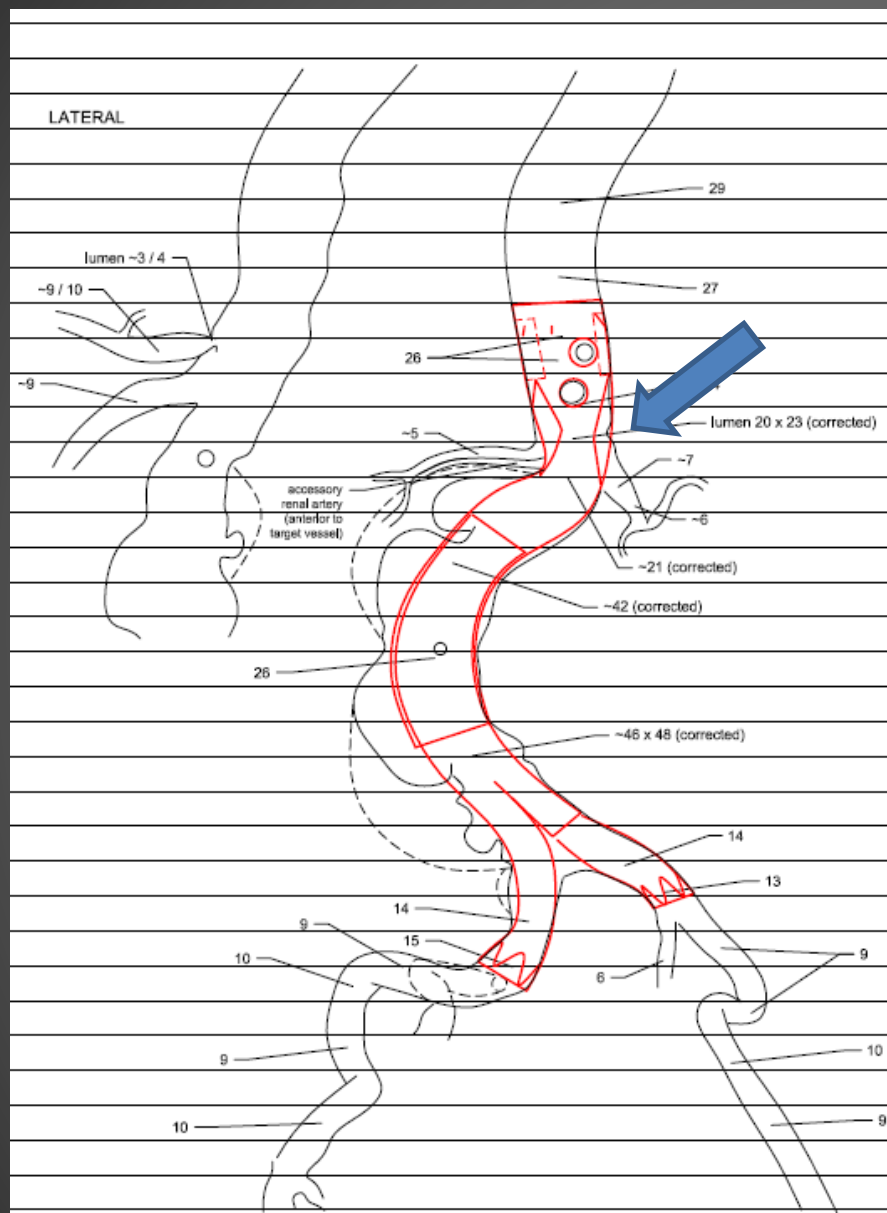
- Steep take-off in conjunction with smaller diameter of the aorta



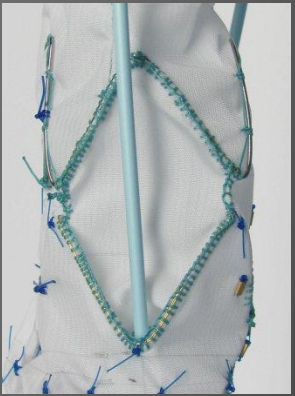
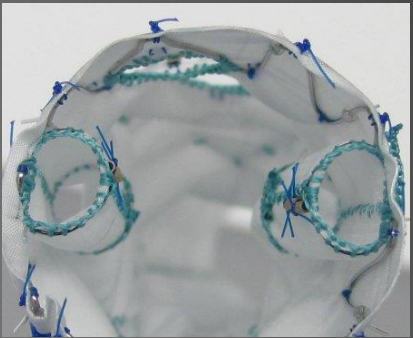
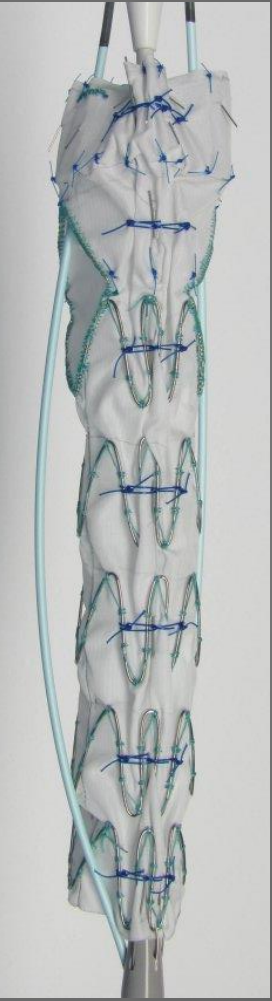
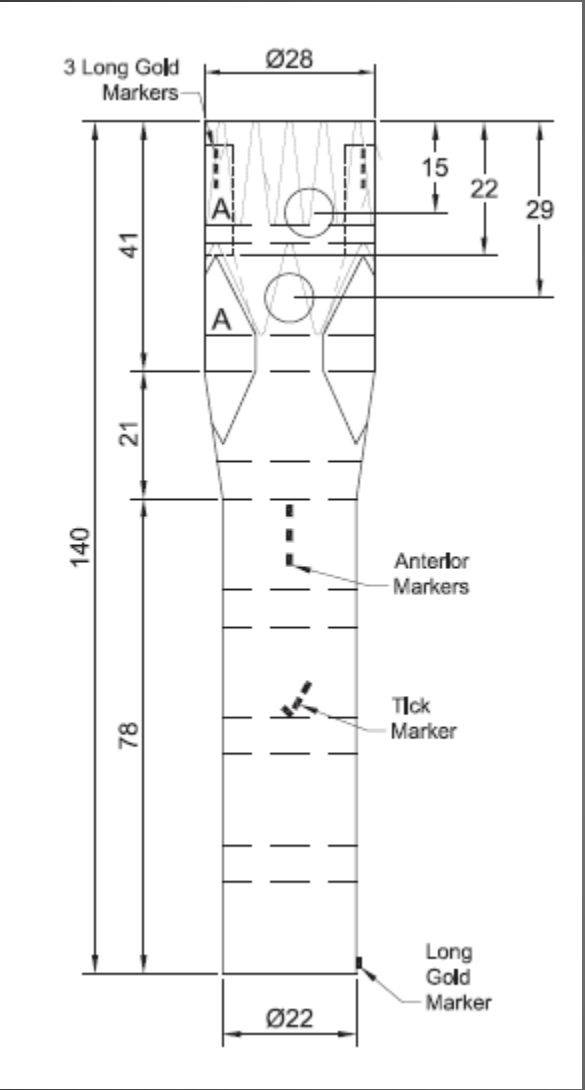
Potential Advantages of Inner Branches

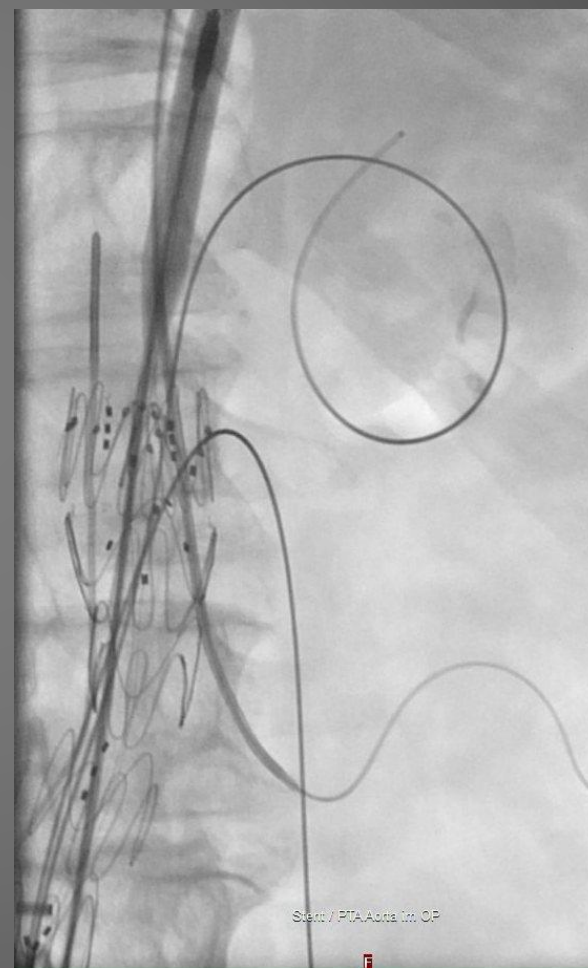
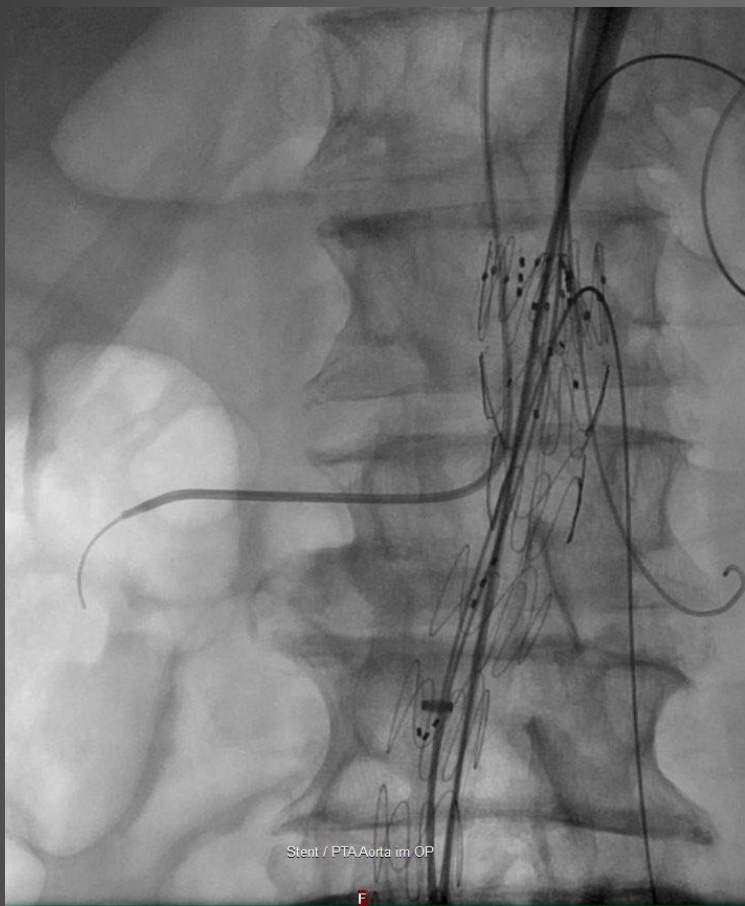
- Compared to „normal“ Branches:
 - No Risk of squashing (angulation/small diameter)
 - Option to keep the main graft wide
 - Start lower in the thoracic Aorta (?)
- Compared to Fenestrations:
 - Longer sealing zone
- Easier catheterization of Target Vessel?
 - Support of the „basket“ guides the catheter

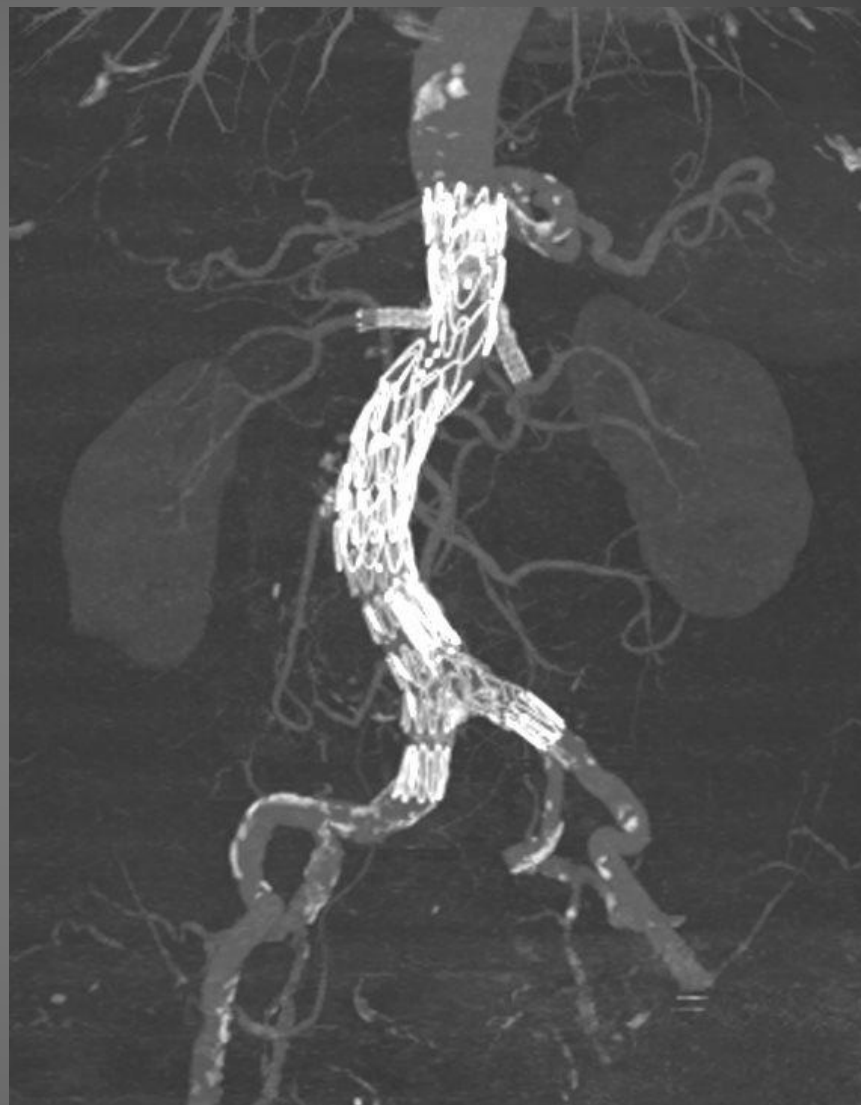
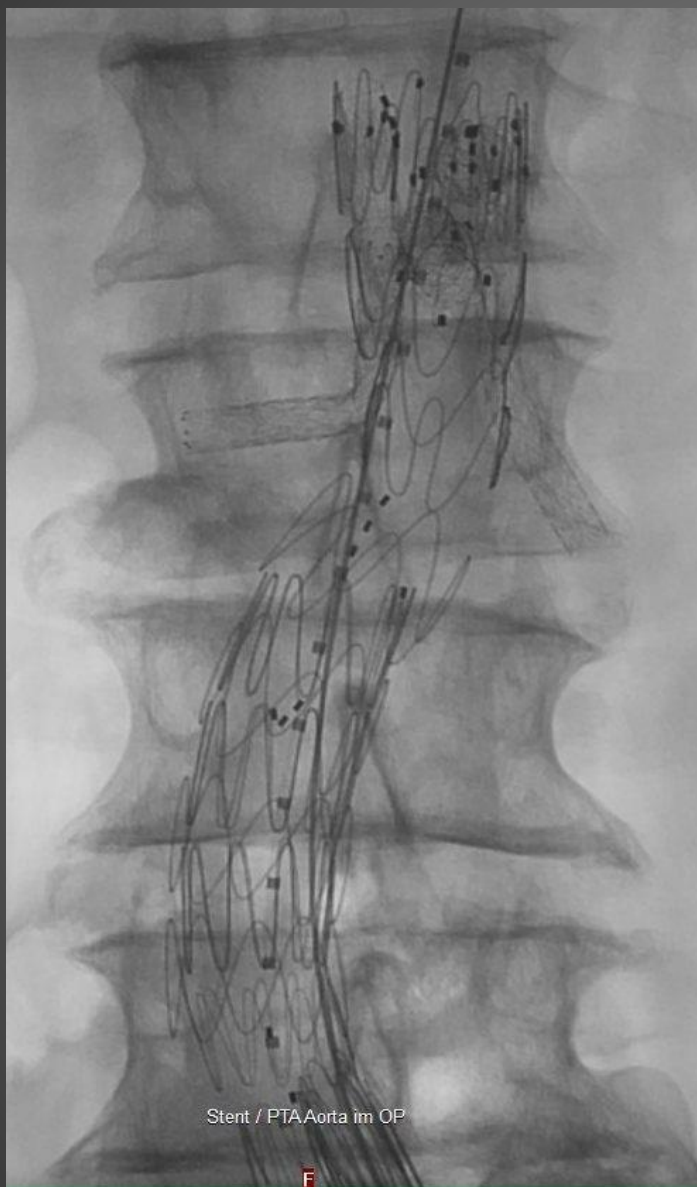




F322



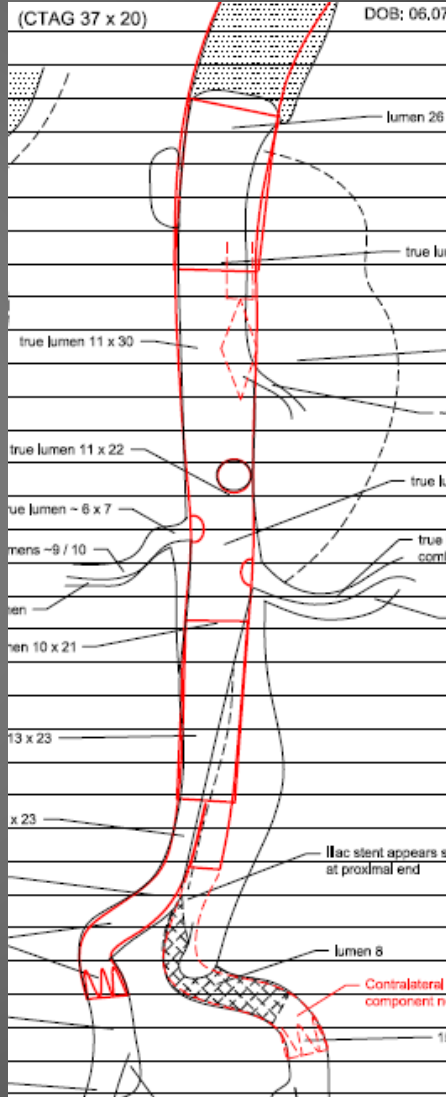
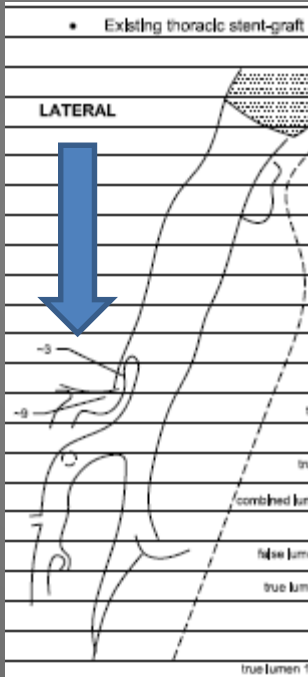
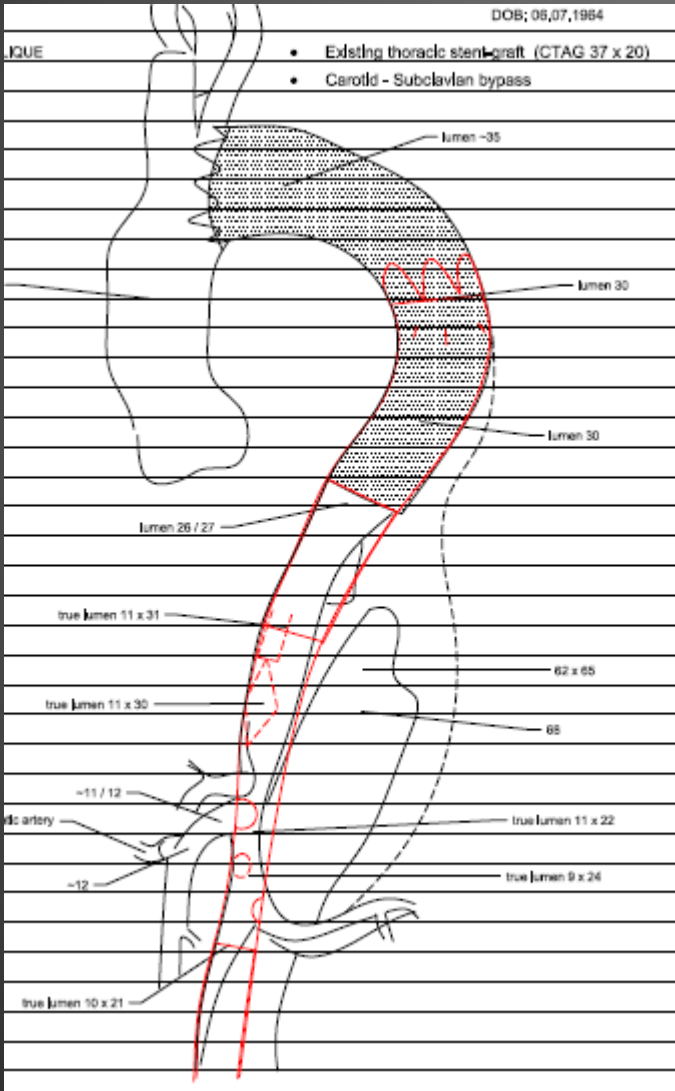




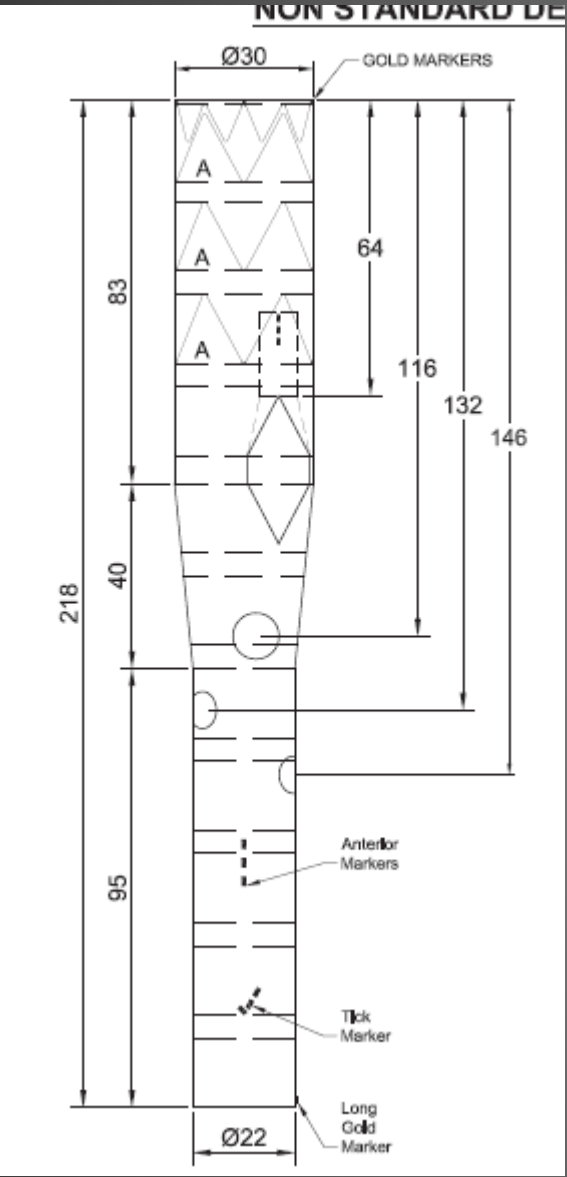
Special Indications

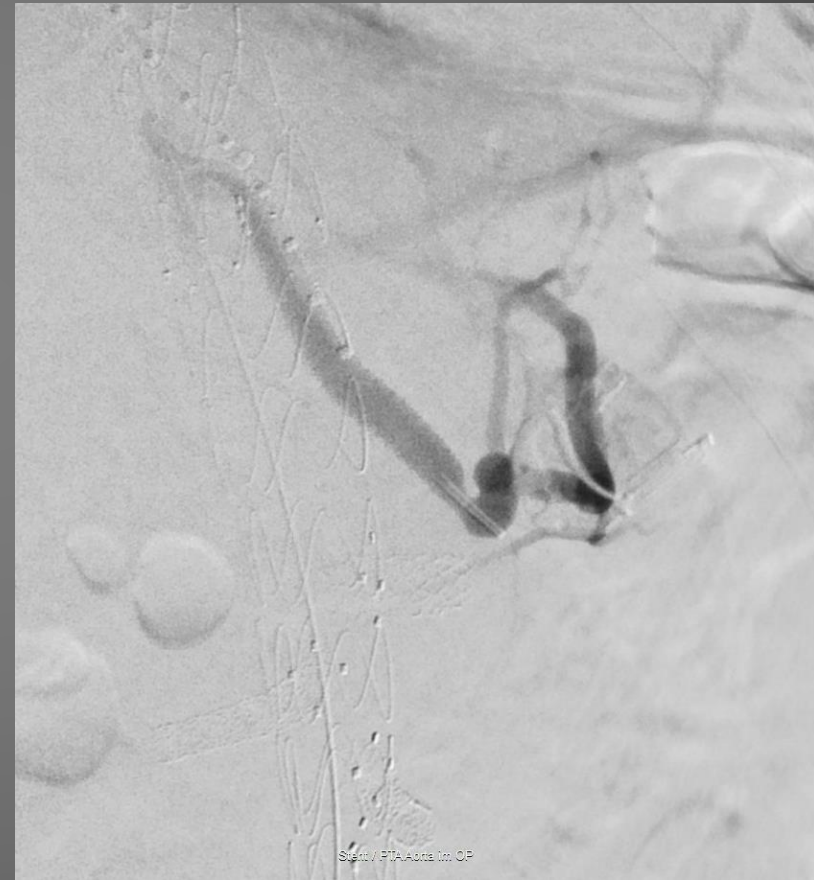
- PDTAAA
- Repair of failing FEVAR

Post-Dissection TAAA



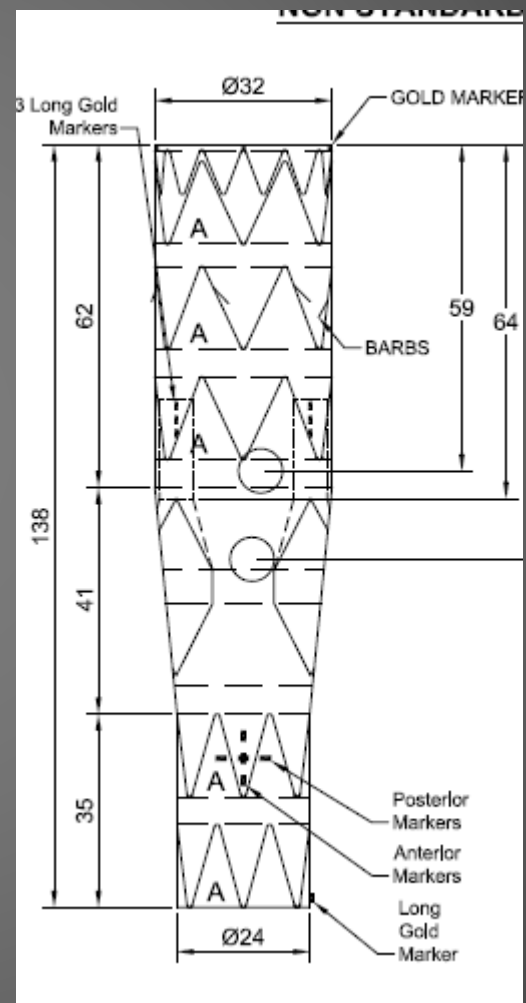
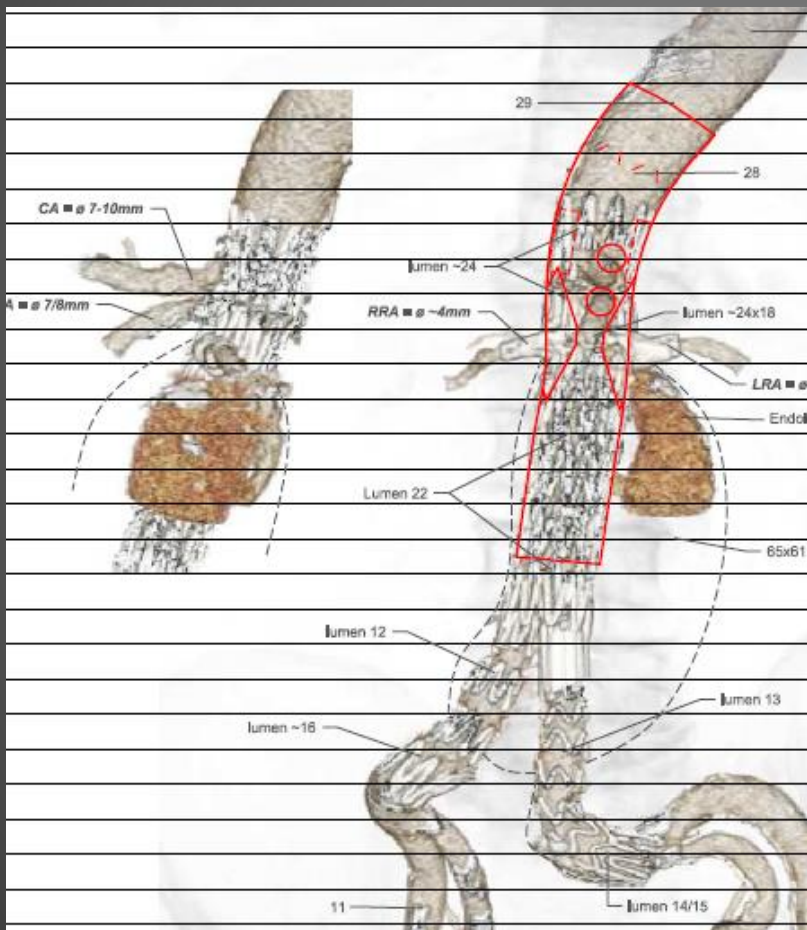
TAB205



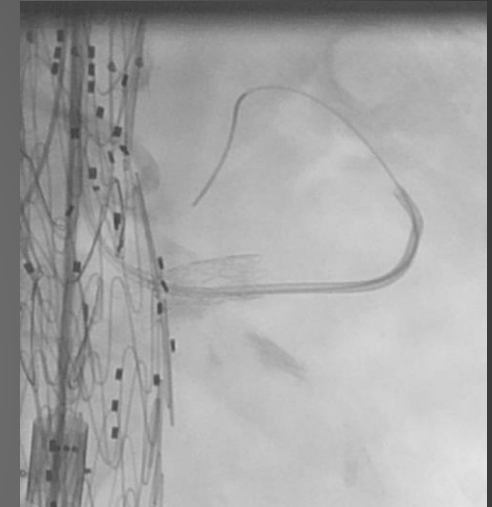
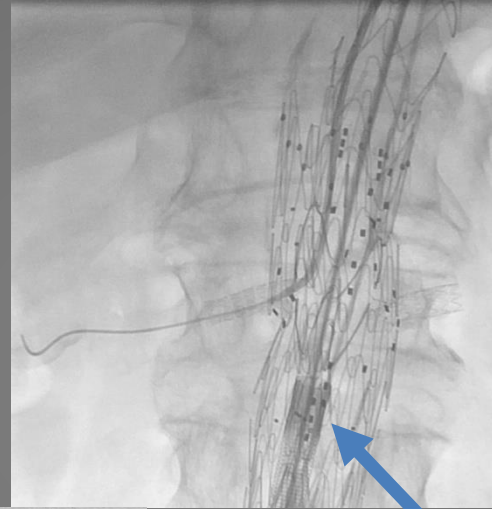




Repair of previous failed FEVAR

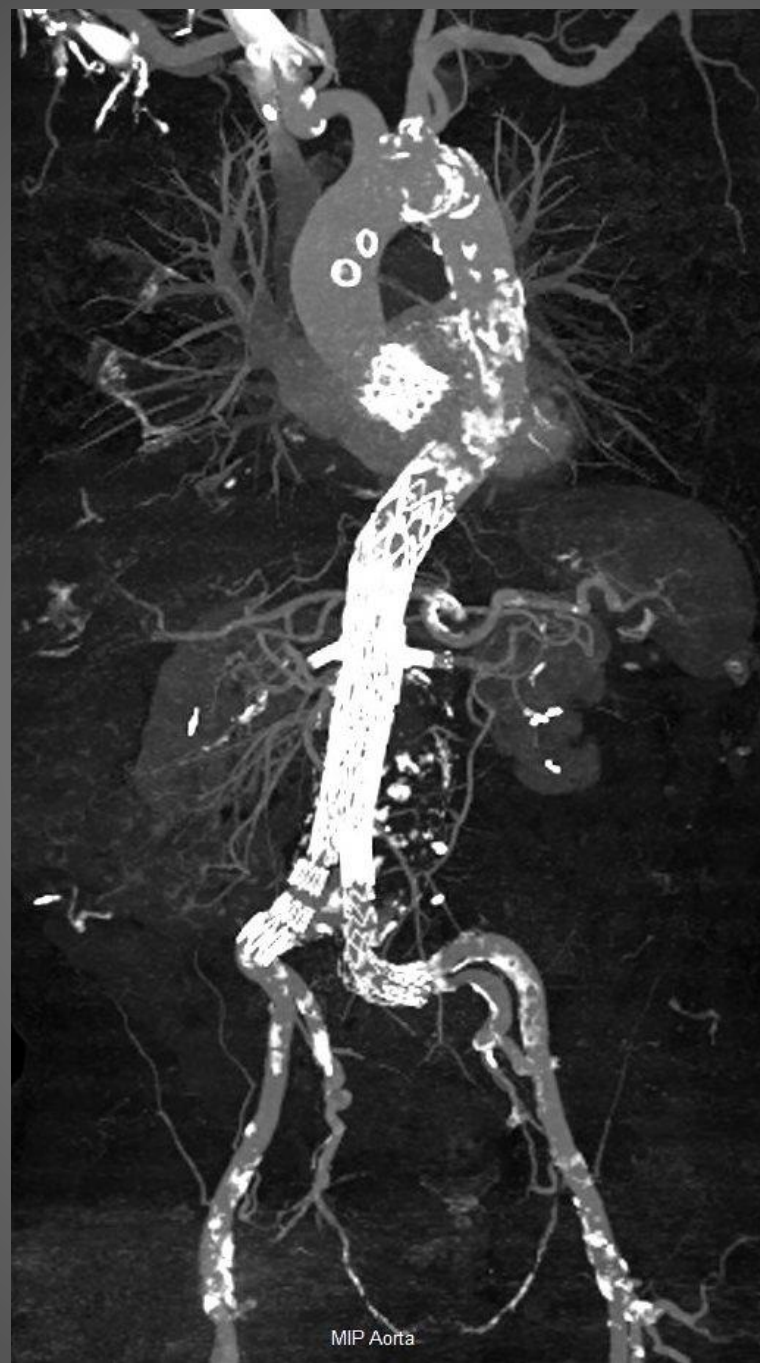


Procedure



Partial Opening of Graft





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Eur J Vasc Endovasc Surg (2018) ■, 1–7

Early Experience with the Use of Inner Branches in Endovascular Repair of Complex Abdominal and Thoraco-abdominal Aortic Aneurysms

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^b Department of Vascular Surgery, Hospital Santa Maria, Faculty of Medicine, University of Lisbon, Lisbon, Portugal

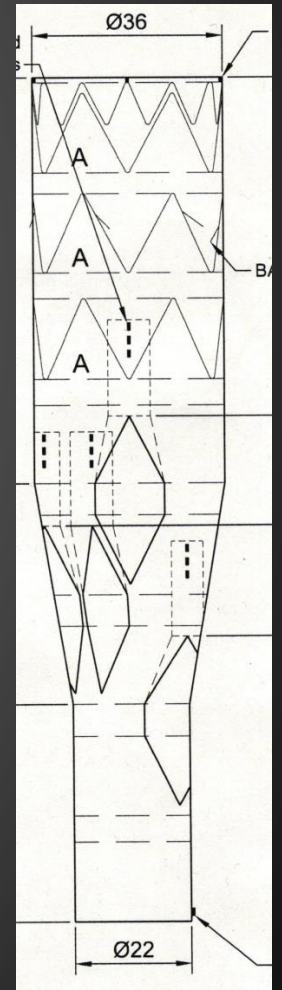
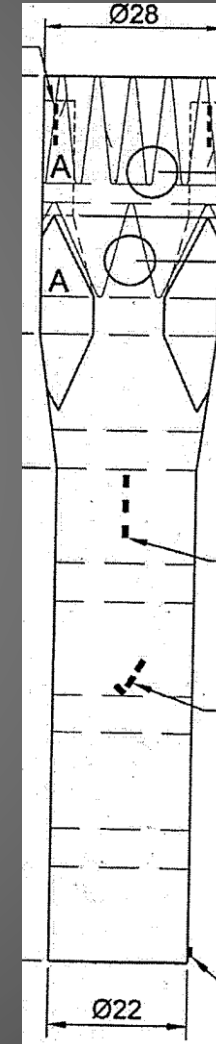
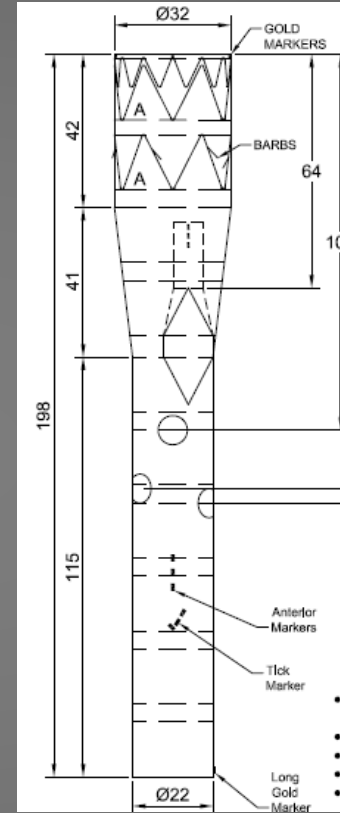
Patients (N=57)

Main Reason for Inner Branch (N=84)

- Target Vessel Anatomy (steep take-off in small diameter)
 - To keep Body of the Graft at wider Diameter
 - To start lower in Aorta
 - Special Indication
-
- Combination of Reason 1&2 in most patients

Stent-graft Design

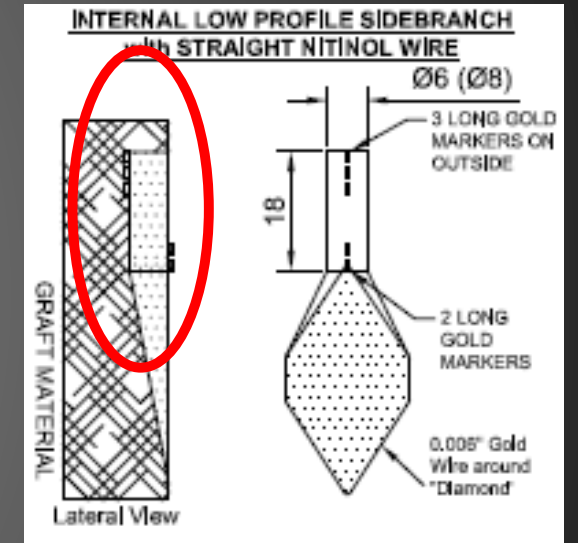
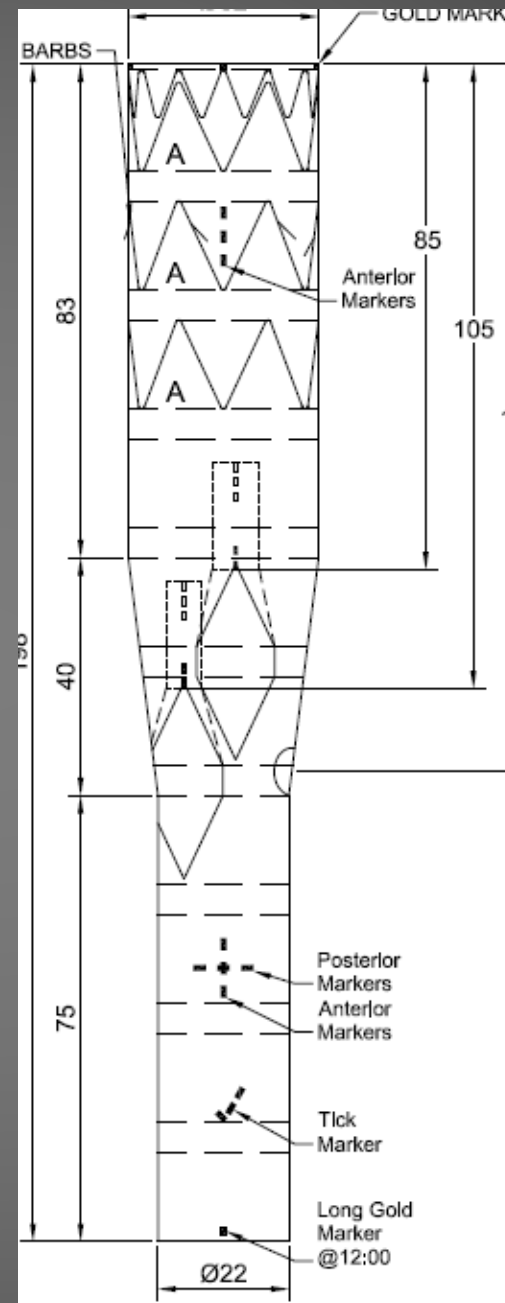
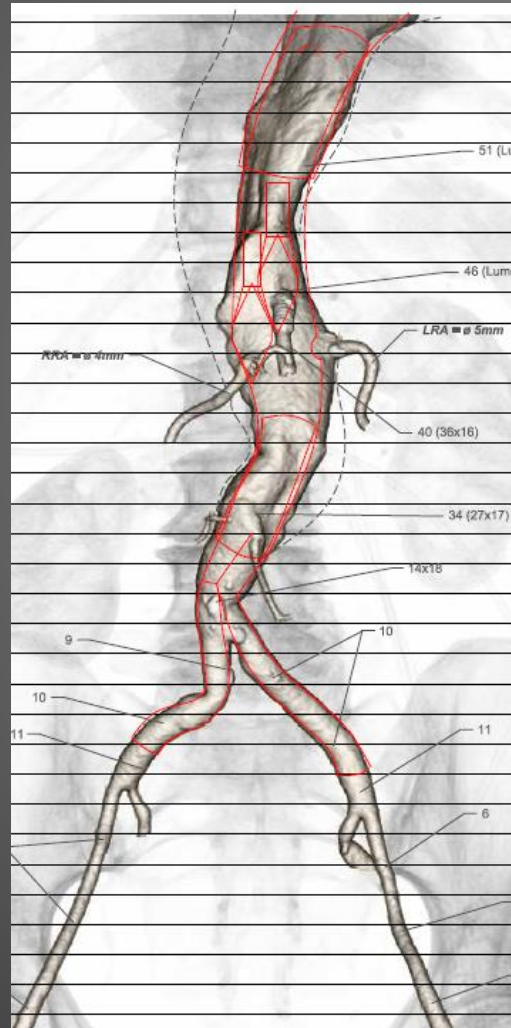
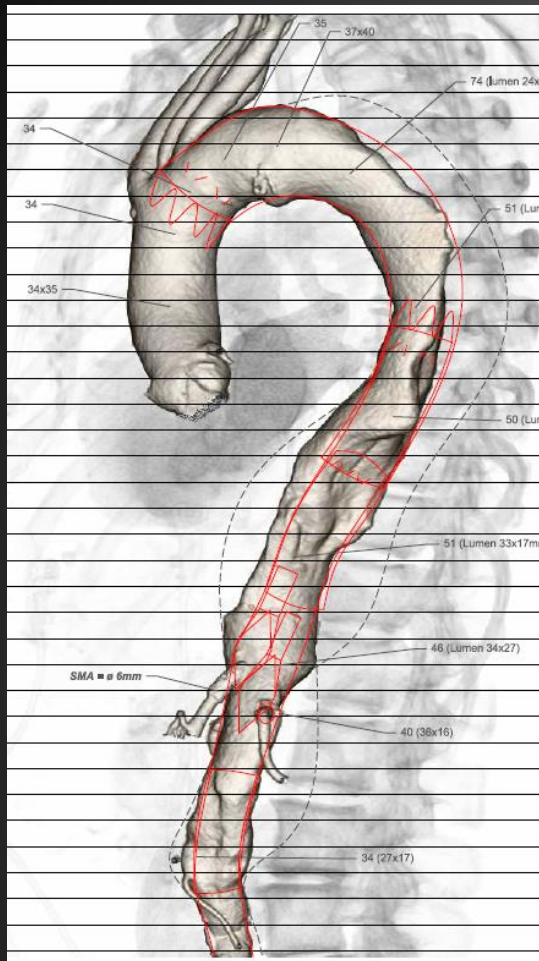
- Inner Branches + Fenestrations
 - N=53
- Inner Branches only
 - N=4



Indwelling Wire

66/84 Inner Branches

- Facilitates Entry in Inner Branch
- Old Design: no markers, difficult to orientate for catheterization (without indwelling wire)
- New Design: markers similar to „normal“ branches



18Fr Sheath
w/o indwelling catheter

Target Vessel Occlusion

Mean FU: 22 months (6-48 months)

- N=7 (8.3%, in 6 patients)
 - 4 Unilateral renal inner branch
 - Recanalisation + thrombolysis: temporary dialysis
 - 1 Bilateral renal inner branch
 - 1 Solitary renal inner branch
 - Recanalisation + Thrombolysis: dialysis with ↑ diuresis

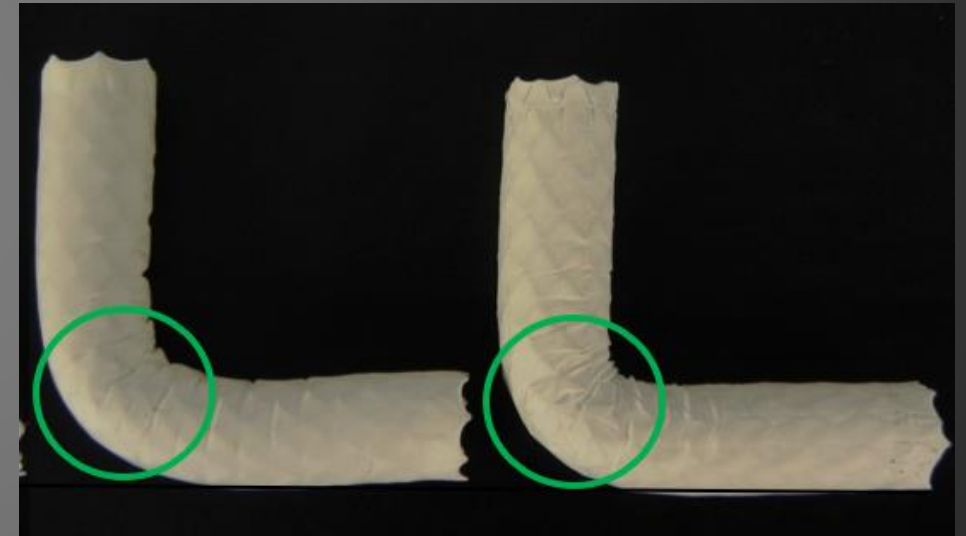
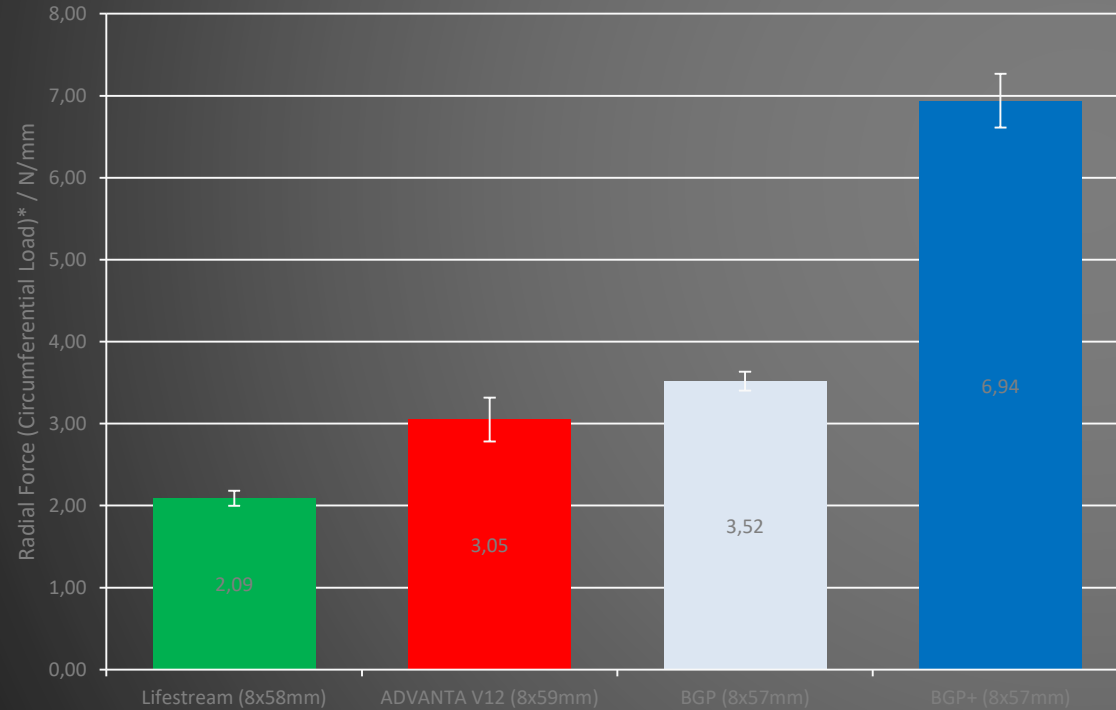
Occlusions (N=7)

Details

| | CA | SMA | RRA | LRA |
|---------------------------------|----|-----|------------------|-----------------|
| Atrium V12 | 8 | 5 | 3 (2 occlusion) | 8 (1 occlusion) |
| Atrium V12 + <u>relining</u> | 11 | | 4 (2 occlusions) | 4 (1 occlusion) |
| BeGraft+ | 12 | 2 | 8 | 6 |
| BeGraft+ + relining | 2 | 2 | | 2 |
| Fluency | | 1 | | |
| Covera | | | 2 | 2 (1 occlusion) |
| Covera + relining | | | | 1 |
| TOTAL | 29 | 9 | 15 | 22 |

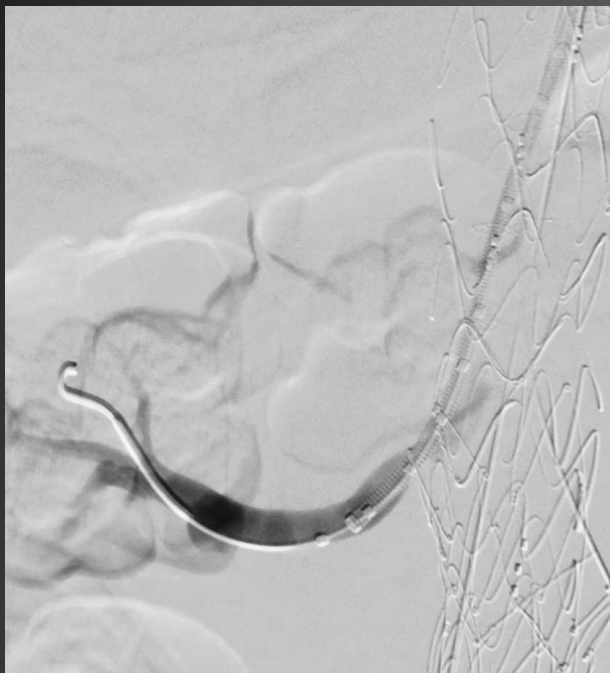
BeGraft PLUS

Radial Force and Kink Resistance

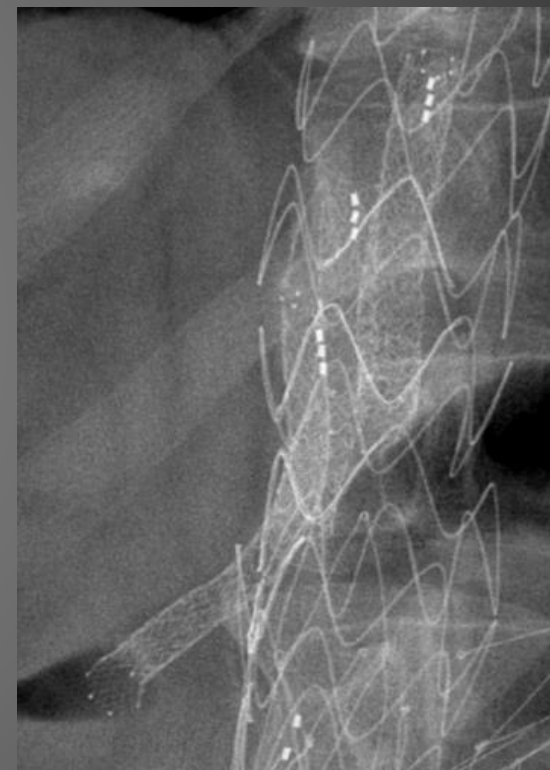


**BeGraft
(8x57mm)**

**BeGraft PLUS
(8x57mm)**



Atrium V12 + Relining (Smart)





Extra relining

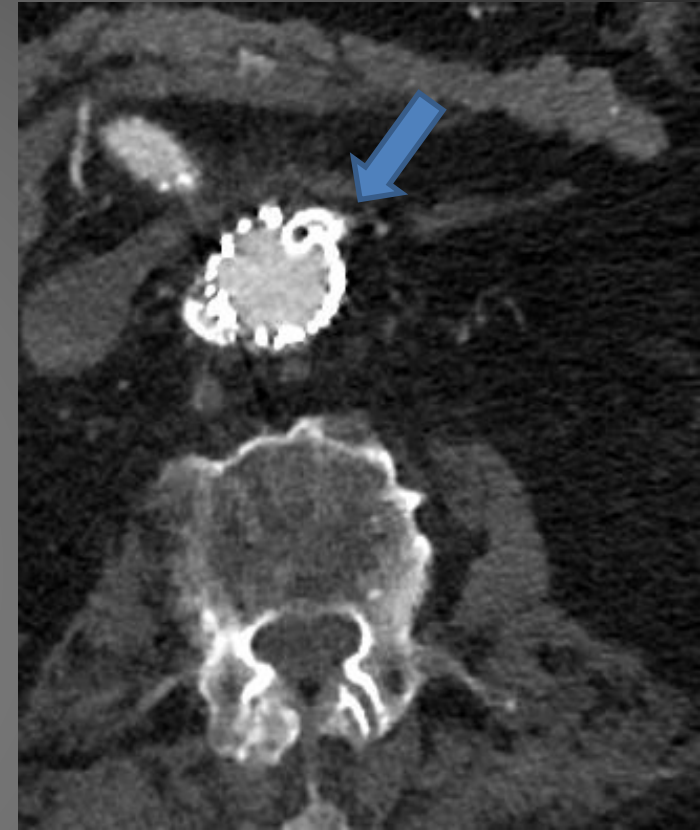
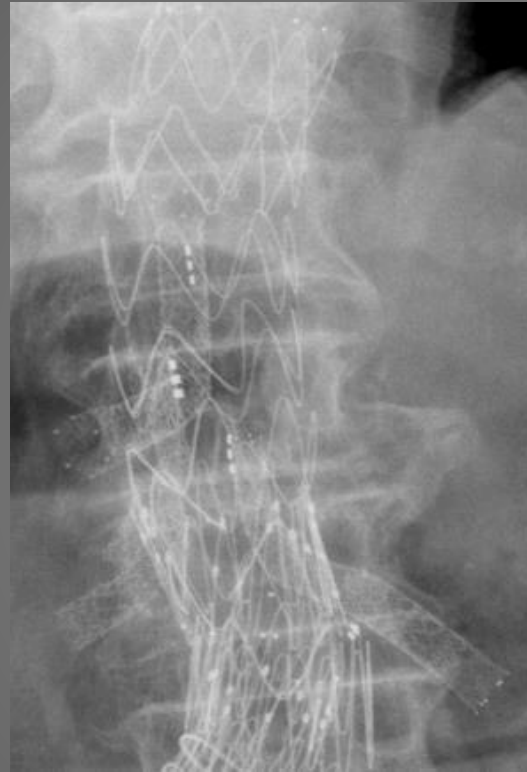


+ thrombolysis

TAB 250



Atrium V12 + Relining (Smart)

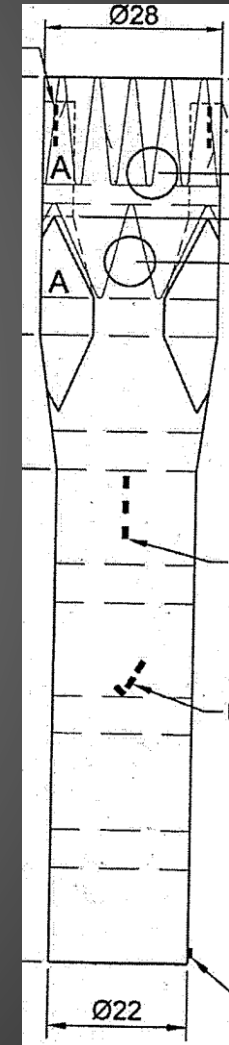
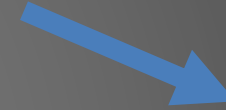


LRA Occlusion:

Suboptimal Orientation of the Graft?
(4 inner branches)

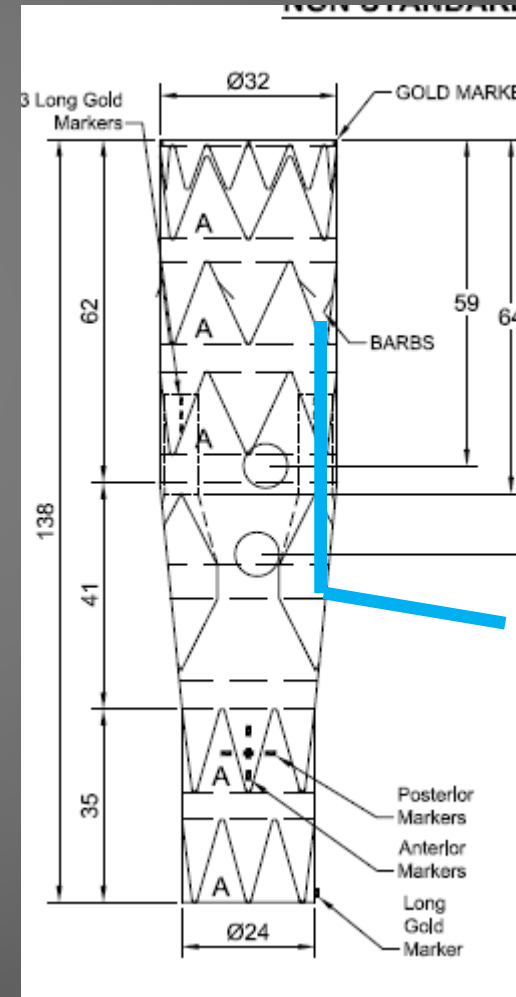
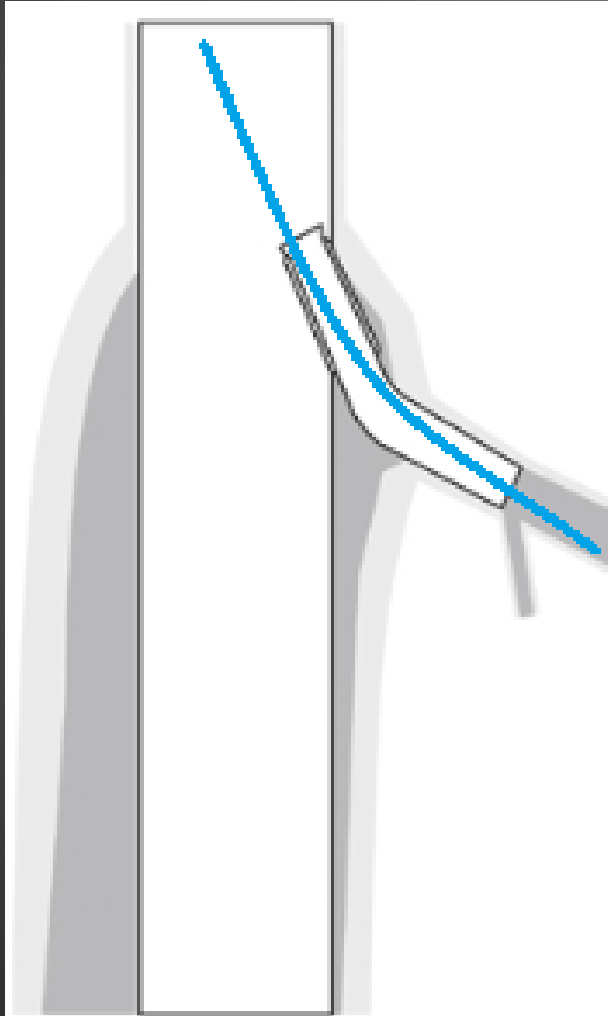
Limitations and Potential

- Big Diamonds
 - Less sealing?
 - Potential design for off-the-shelf devices?
 - inner branches for both renals + fenestration for SMA?
 - Four inner branches with „wide body“ graft?
- Limitations in positioning
 - Have to fit inside existing Z-Stent



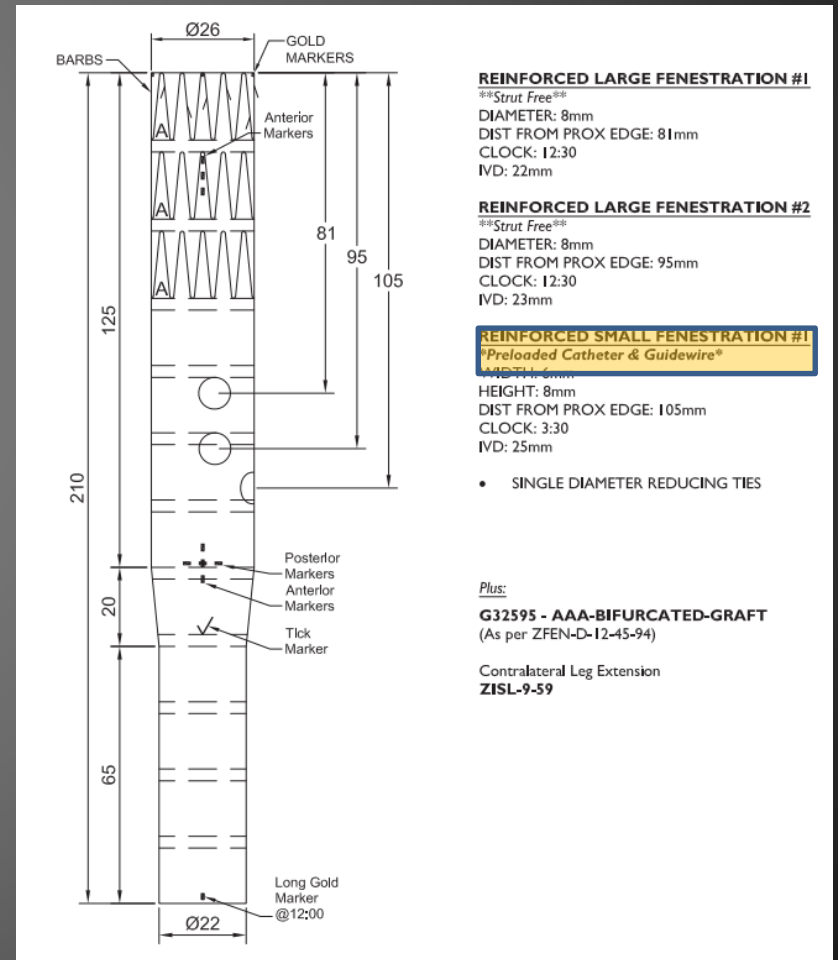
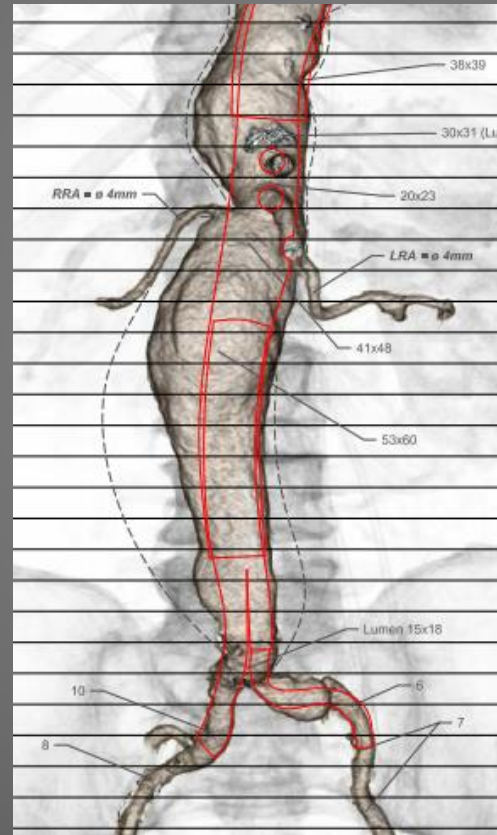
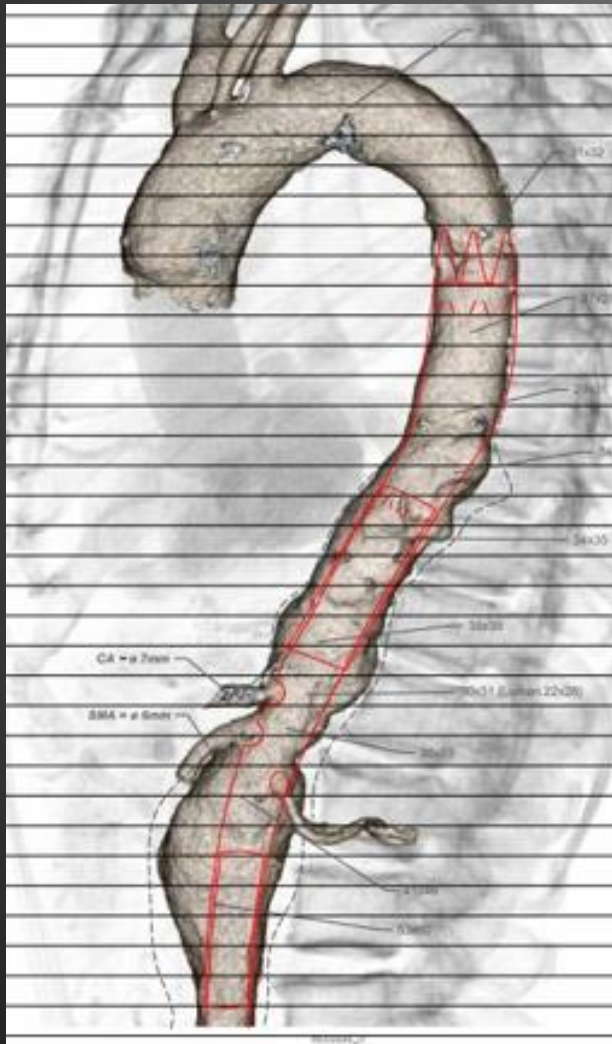
Additional Risk due to sharper Angle?

(Especially in Renal Arteries?)

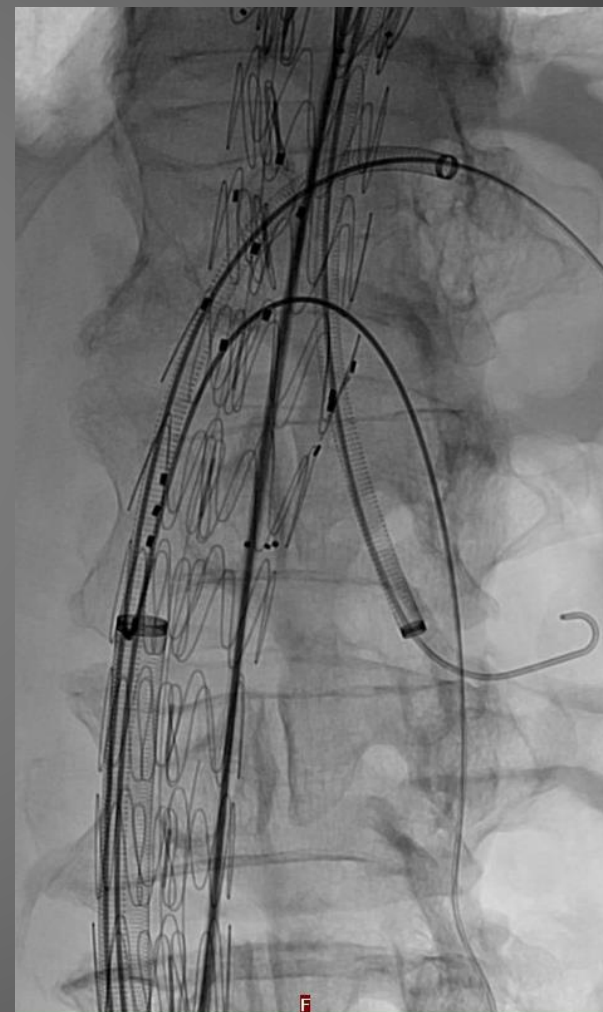


Alternative for Inner Branch?

Fenestration with Upper Approach



Procedure



Conclusions

(to answer the Question)

- Technical Tips:
 - Use indwelling Catheter and Wire
 - Come from above and keep wire inside branch
 - Use kink-resistant Bridging St-Gr: BeGraft PLUS
 - Smoothen transition zone where needed
- Indication: not without good reason...
 - Four Inner Branches with wall contact obsolete?
 - Not in Renal Arteries?