



Aortic live 2017

23 -24<sup>st</sup> October 2017 / Hamburg , Germany

New horizon for treatment of the arch pathologies  
Initial experience with the Jotec reversed-  
branched arch device

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# Disclosure

Speaker name: Marwan Youssef

I have the following potential conflicts of interest to report:

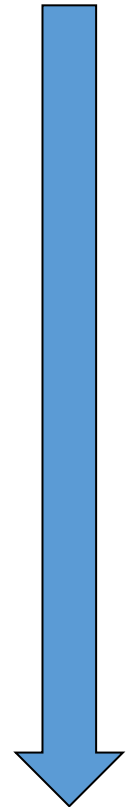
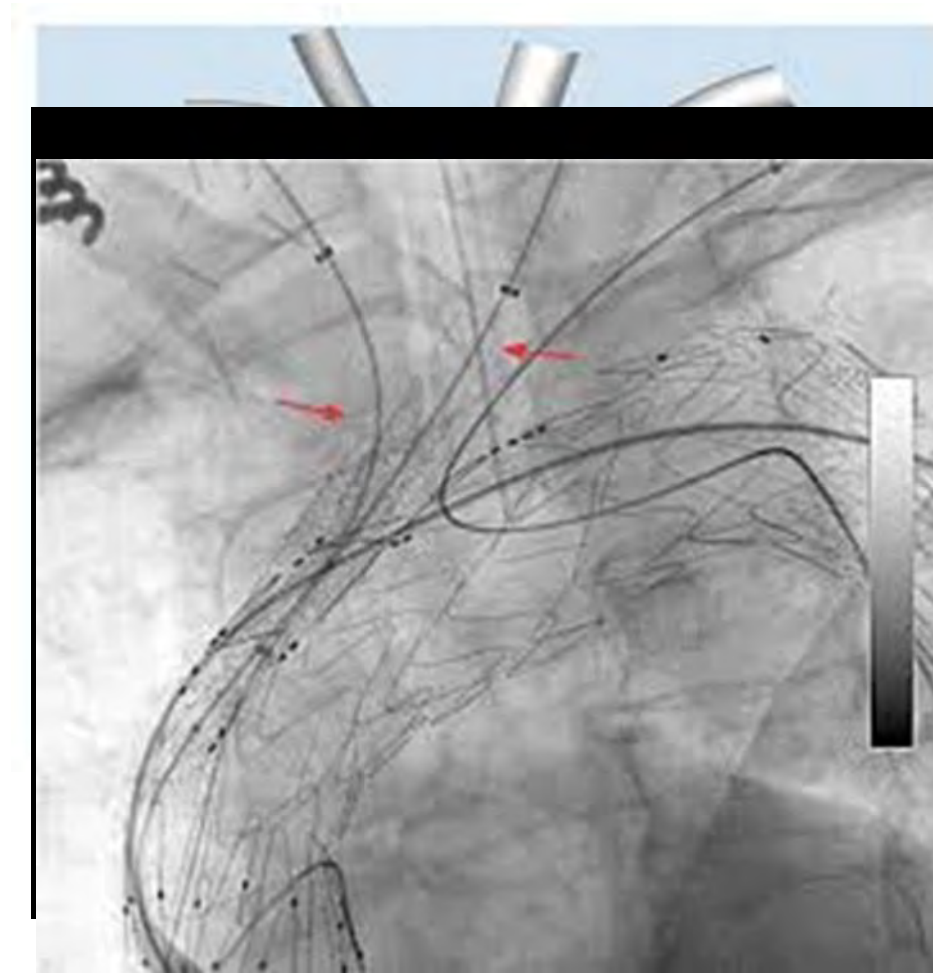
Dr. Marwan Youssef is speaker and consultant for :

- **Jotec**
- Bolton medical
- Endologix
- Cook

# Introduction:

therapeutic options of the aortic arch pathologies

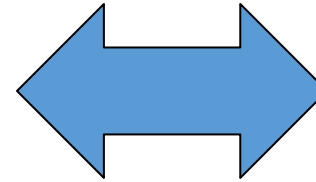
- **conventional open repair (with / without FET.)**
- **Hybrid-approach**
- **Total endovascular repair**



# Open surgery of the aortic arch

## The gold standards :

- HLM & selective perfusion
- hypothermia
- Circulatory arrest



<https://www.klinikum.uni-heidelberg.de/>

**Considerable mortality and morbidity rate in  
high-volume centers and in low risk patients:**

**9% mortality**

**4-12% stroke**

- ❖ Minakawa M, et al. Early and long-term outcome of total arch replacement using selective cerebral perfusion. Ann Thorac Surg. 2010 Jul; 90(1):72-7.
- ❖ Tian DH, et al. A systematic review and meta-analysis on the safety and efficacy of the frozen elephant trunk technique in aortic arch surgery. Ann Cardiothorac Surg. 2013 Sep; 2(5):581-91.

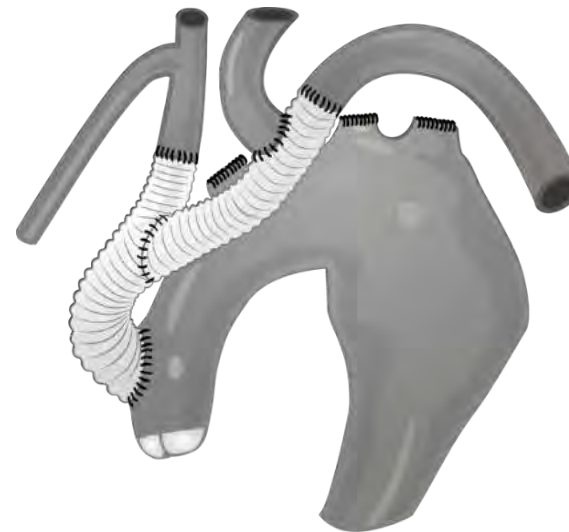
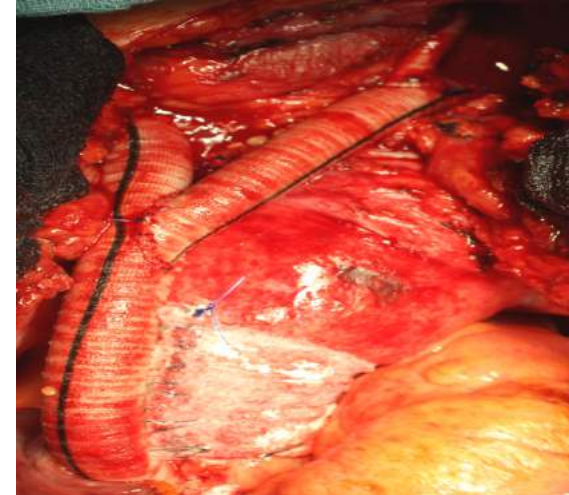
# Hybrid-procedure: Debranching & TEVAR

- Initially introduced to high-risk patients
- Better Outcome ?

Hybrid Vs. OR:  
No Significant Difference:  
Stroke & Mortality

- In-hospital mortality: 11.9 VS. 9.5%.
- Stroke rate: 7.6 VS. 06.02%

Moulakakis KG et al. Ann Cardiothorac Surg. 2013 May;2(3):247-60  
- De Rango P, et al. J Vasc Surg. 2015 Feb;61(2):339-46.  
- Chiesa R, et al. J Endovasc Ther. 2010 Feb;17(1):1-11.

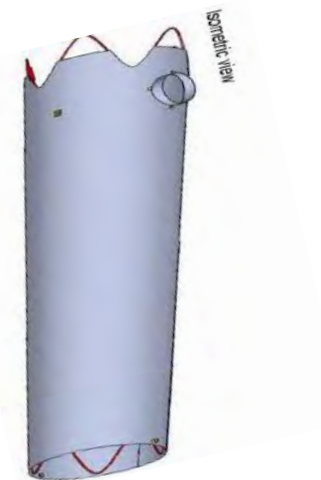
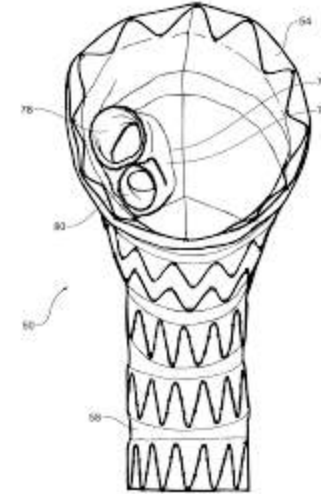


# Total-endo: CMDs fenestrated / branched endografts

- **Technology still in development ..**
- **Few manufacturers / restricted technology!**
- **The experience is still limited**
- **Outcome depends on the learning curve**

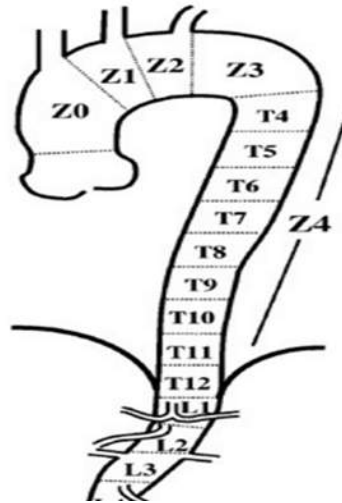
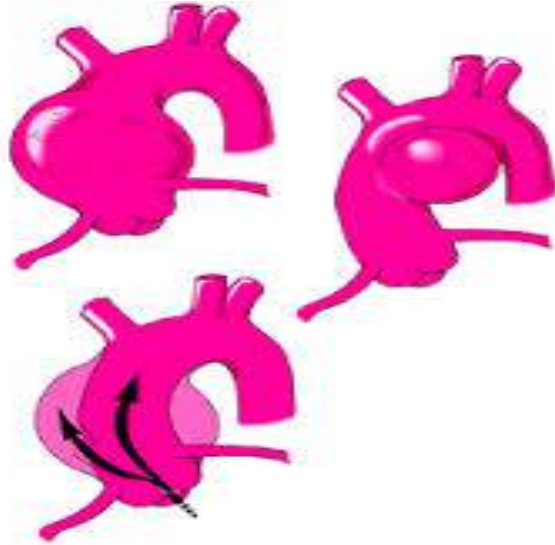
**Haulon S, et al. Global experience with an inner branched arch endograft. J Thorac Cardiovasc Surg. 2014**

- **bTEVAR: 1/14 stroke , No Mortalities**  
**Kölbel T, et al JVS 2016**



# Challenges of endo arch repair

## various Pathologies...



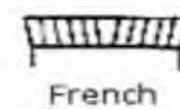
## various anatomies



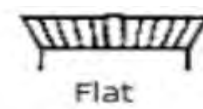
triangular arch



Corbel arch



French arch



Flat arch



round arch



Roman arch



Horseshoe arch



Bell arch



Trefoil arch (Gothic)



Lancet arch (Gothic)



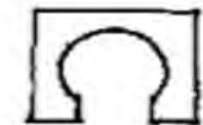
Tudor arch



Ogee arch



Segmental arch

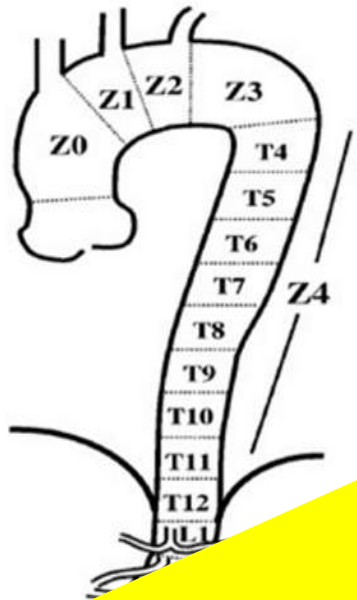


Syrian arch

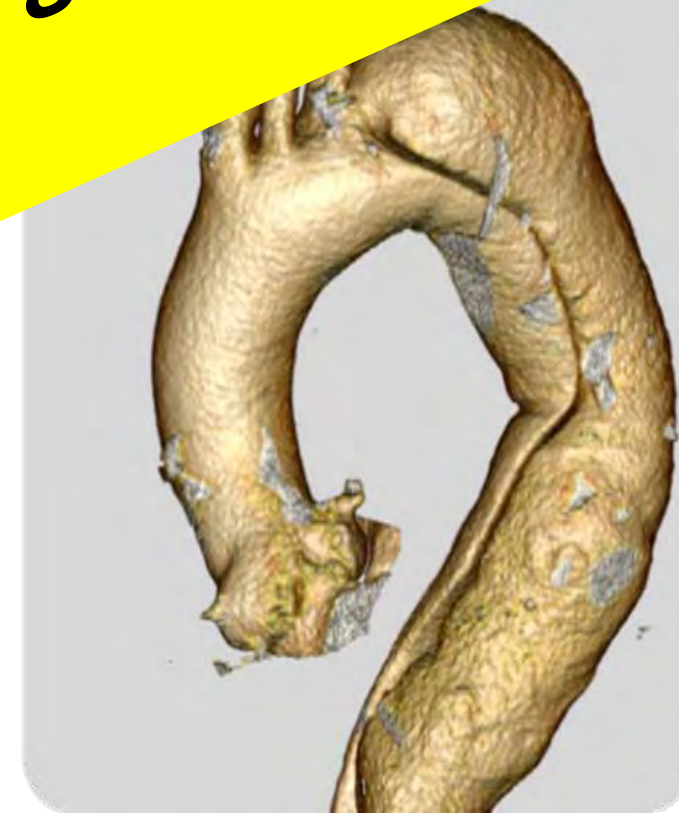
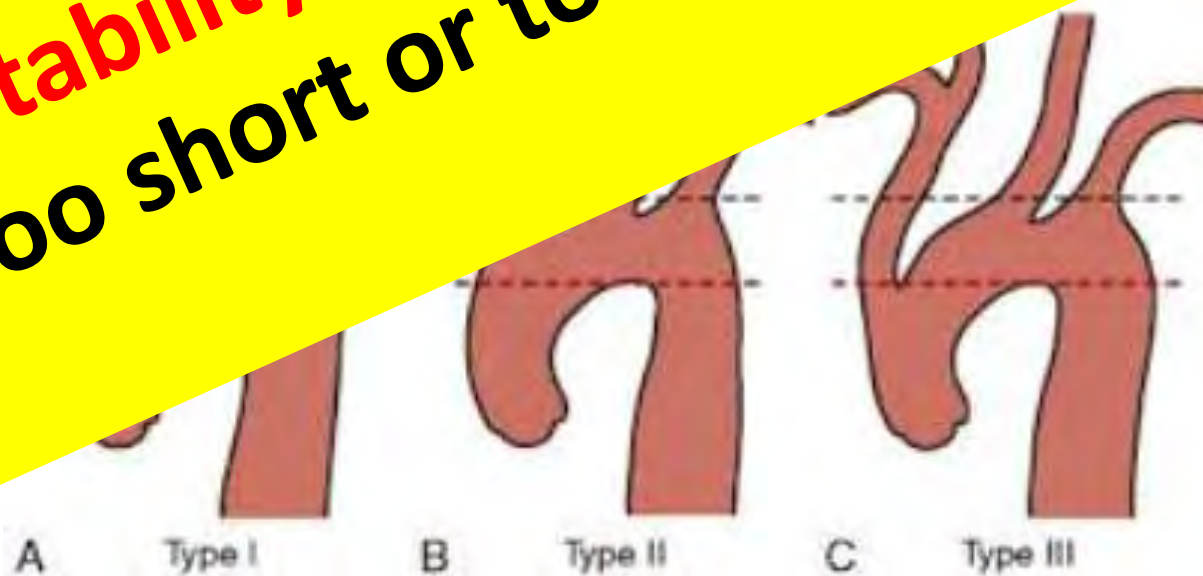
- Outer & inner curvature
- Varied origins of the arch vessels
- Dynamic environment:
  - Graft dislocations
  - Migrations
  - Fractures



# Challenges of endo arch repair: Morphological criteria



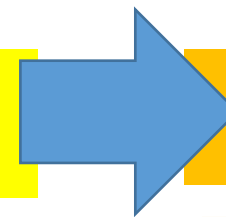
**Many Endo candidates : rejected !**  
**Unsuitability:** Ca. 30 % after type A-repair  
**“Graft too short or too large, major graft kink ..”**







➤ **Personal experience**



**Endo TAAA**

**Endo Arch**

**Ch-TEVAR**

**FEVAR**

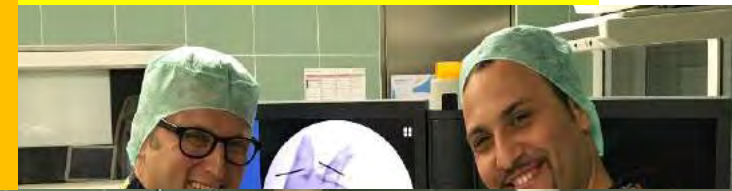
**bTEVAR**





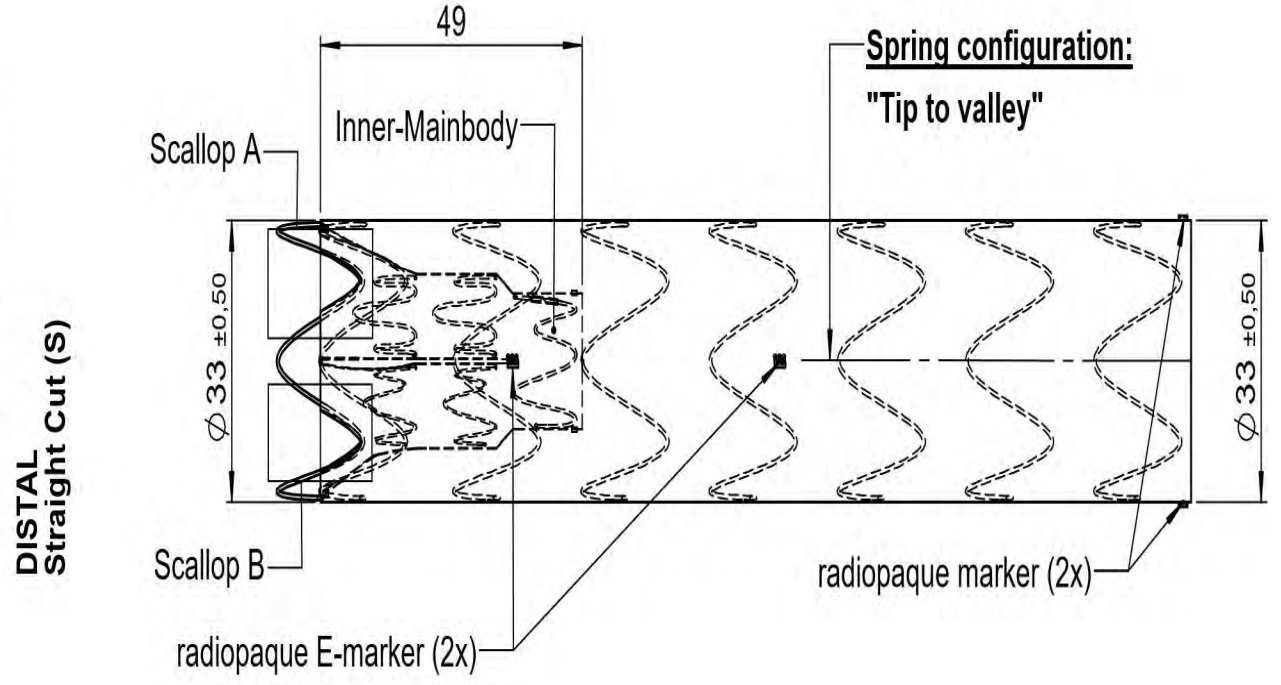
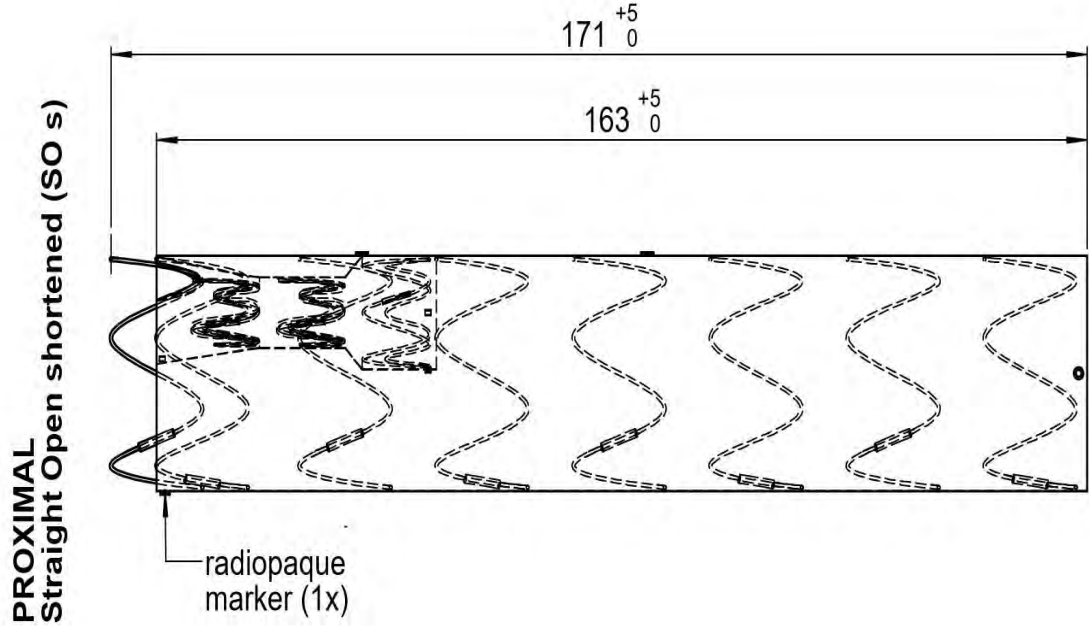
# Concept of novel arch device: reversed inner branch technique

First implantation  
Juni 2016 / Mainz

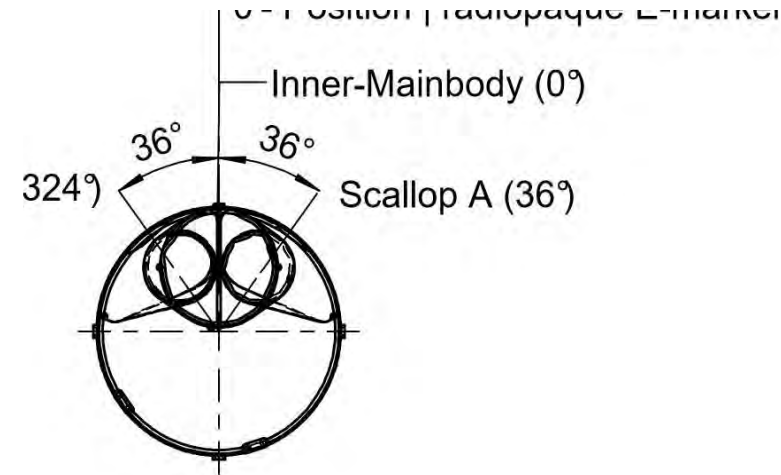
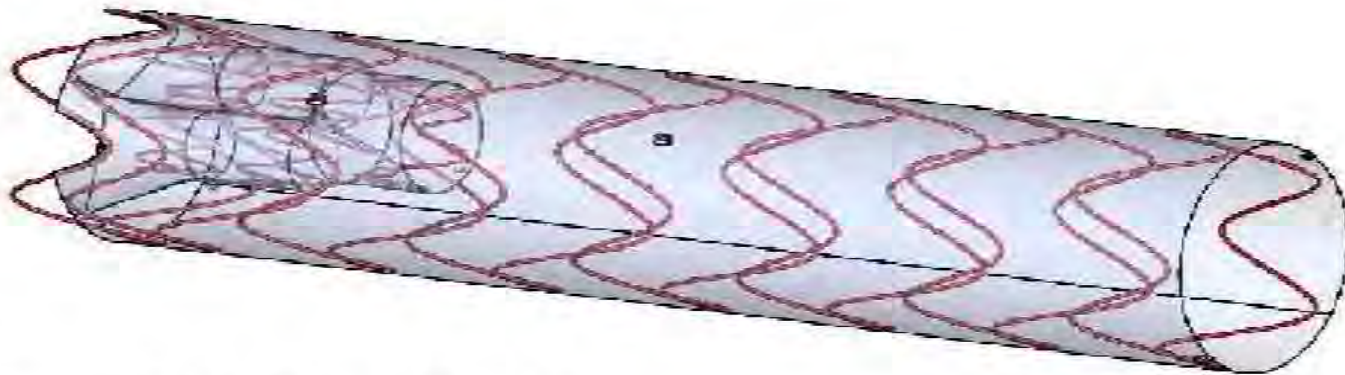


Jotec aortic device with reversed double Branches

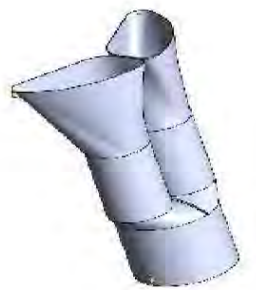
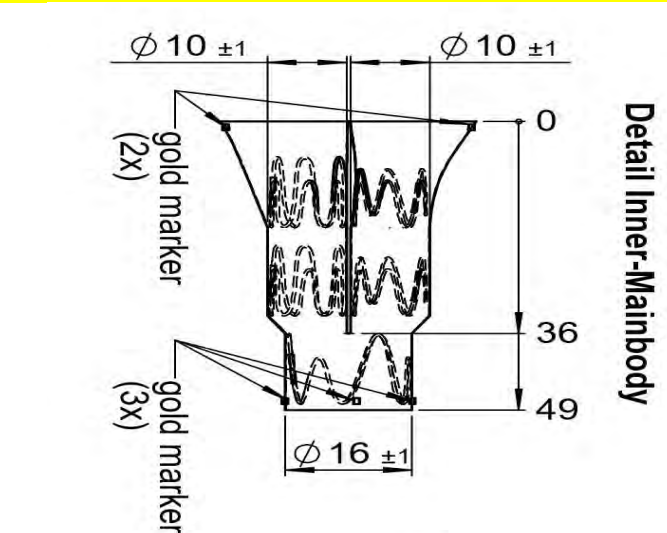
# Graft design



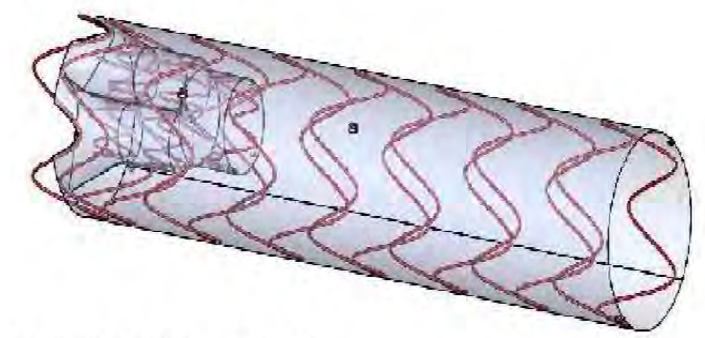
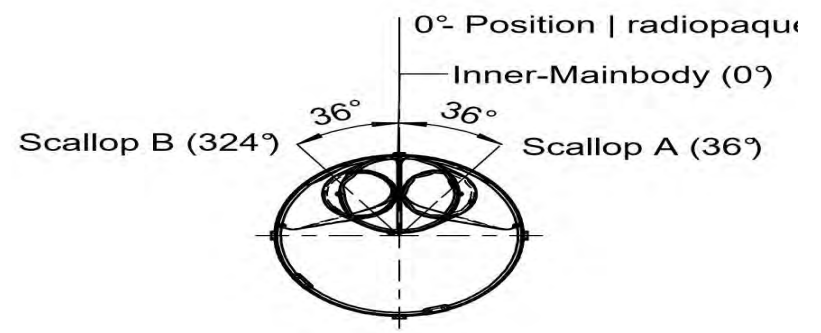
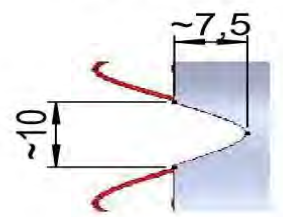
## Isometric View



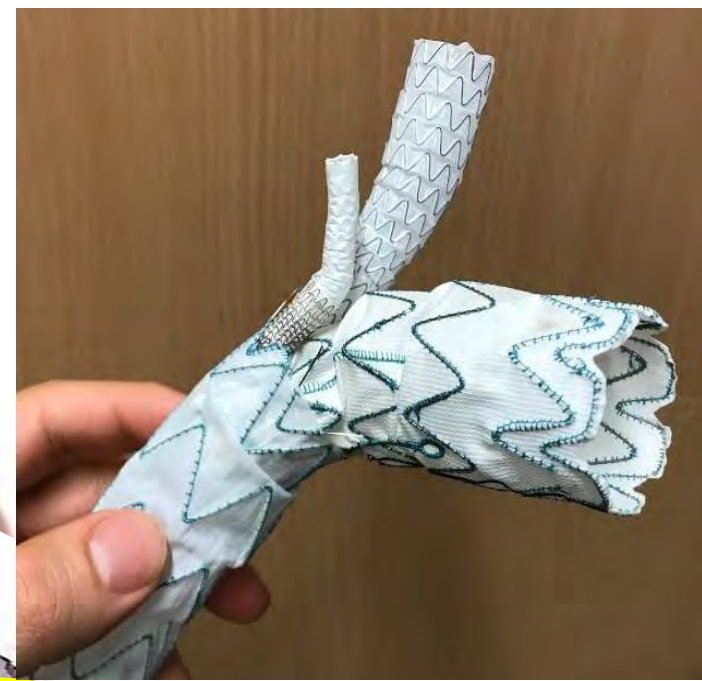
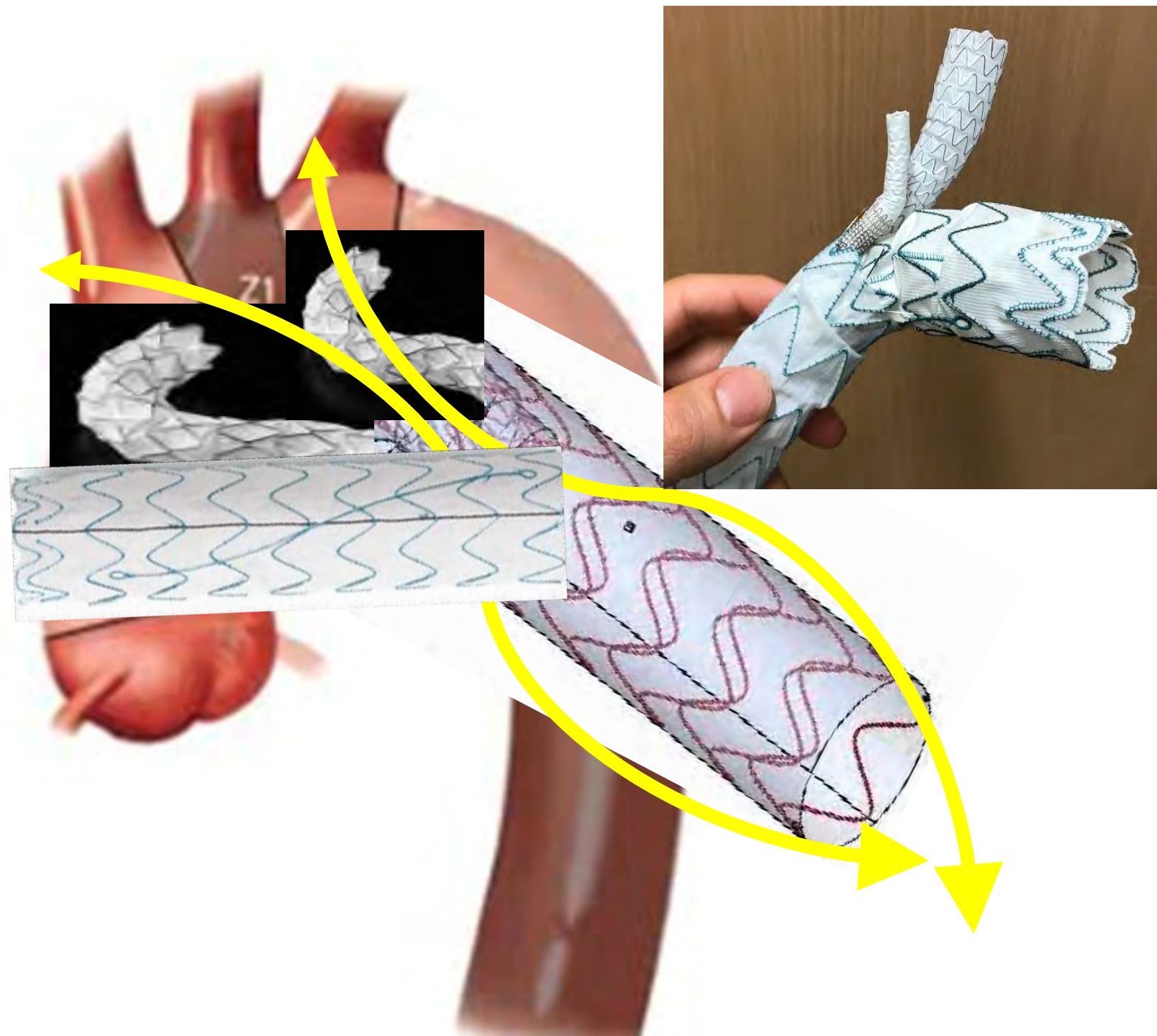
# Graft design: inner reversed branch technique



Detail Scallop A + B



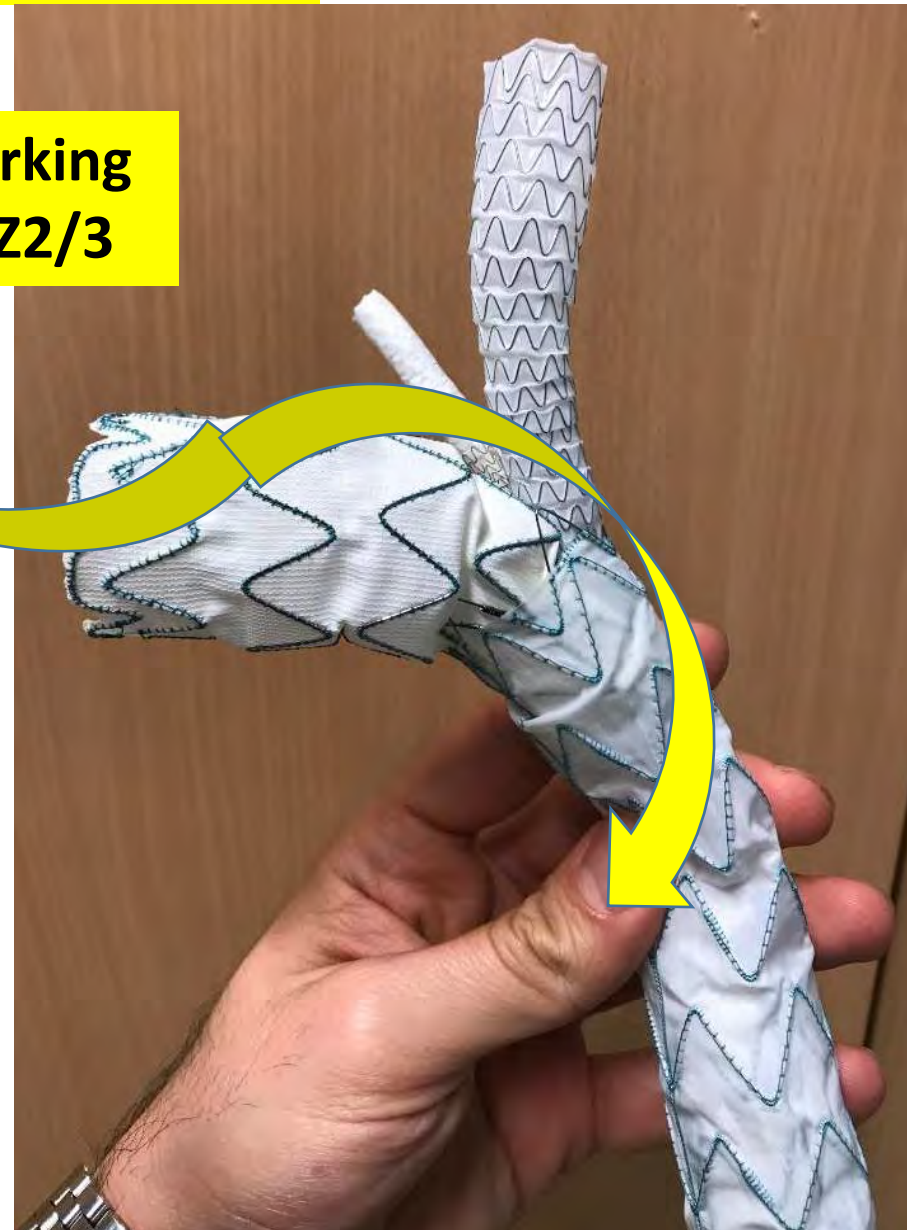
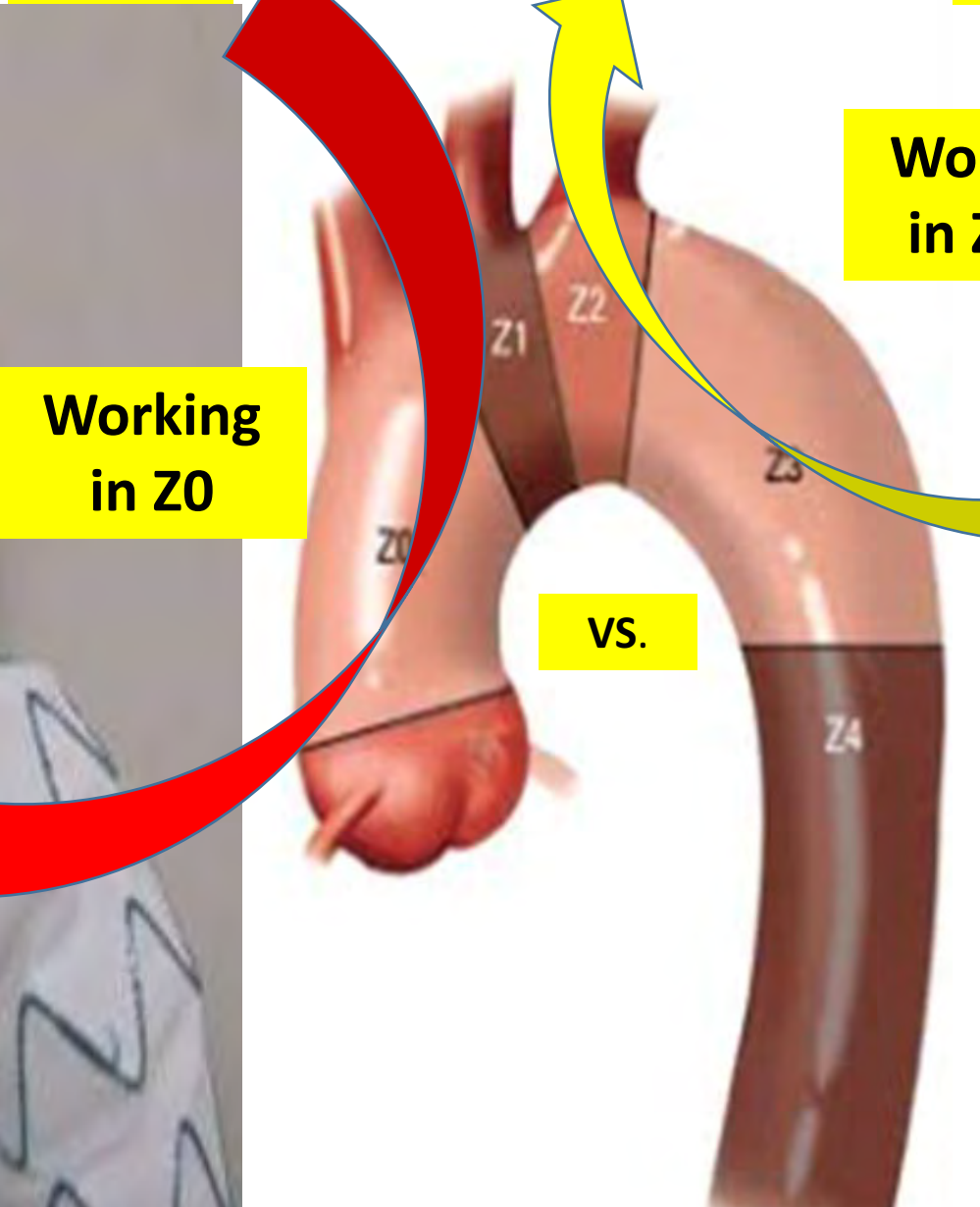
# Procedure



**End of the wires  
supracoronary**

**Why reversed not conventional antigrade  
?**

**Working  
transfemorally**



**Working  
in Z0**

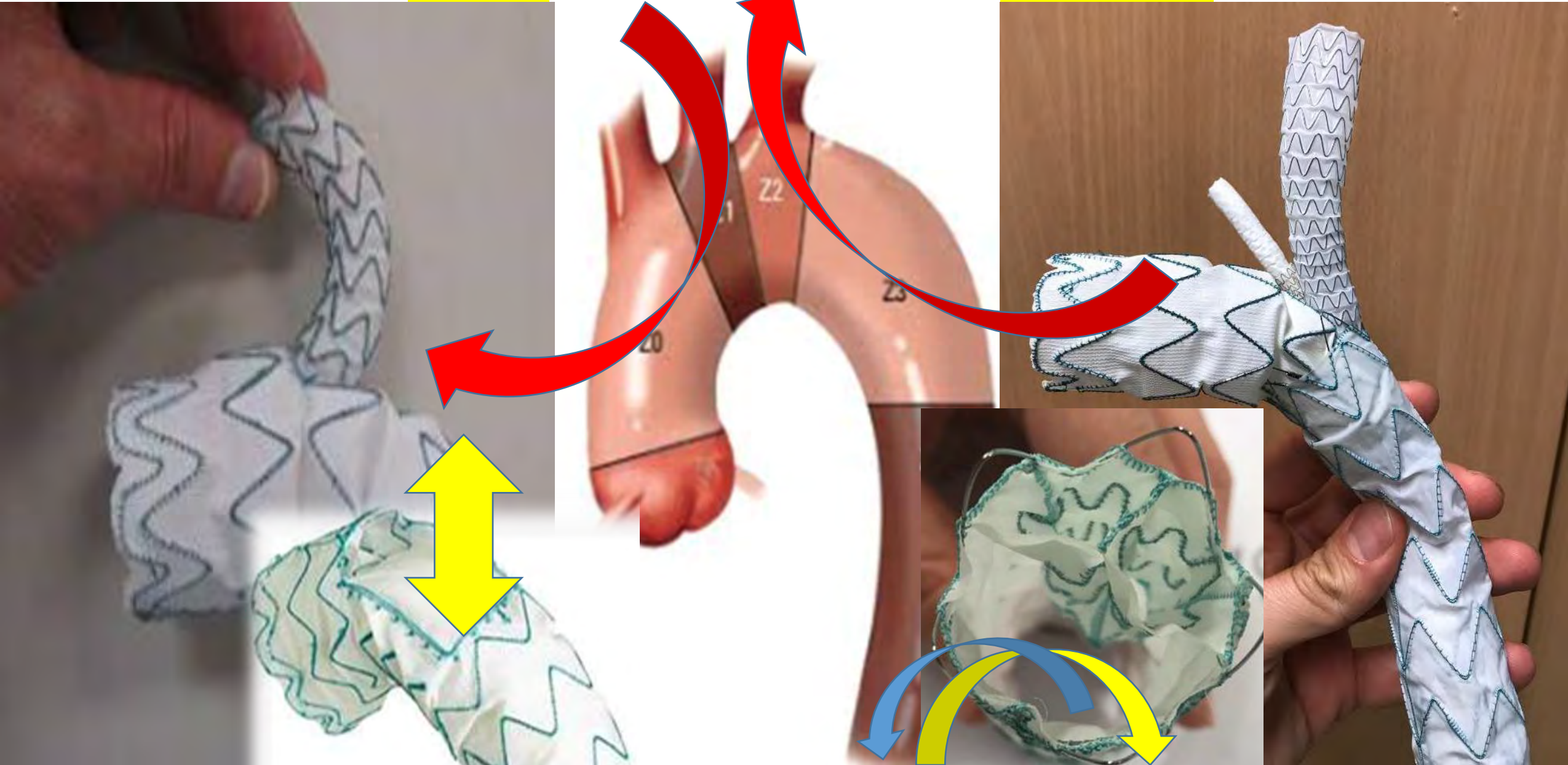
**Working  
in Z2/3**

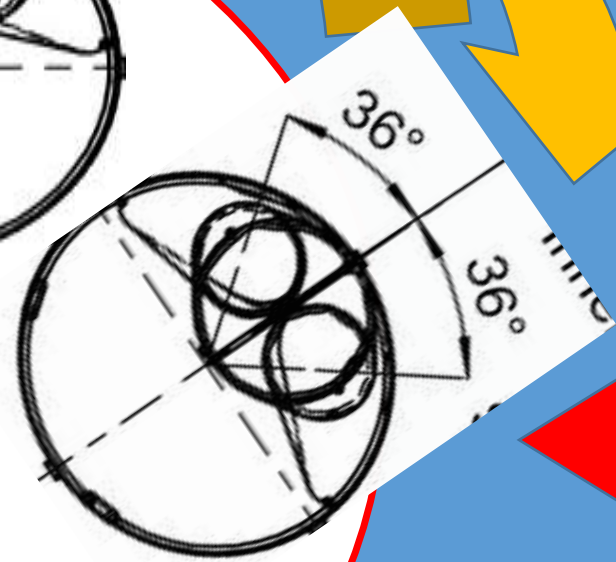
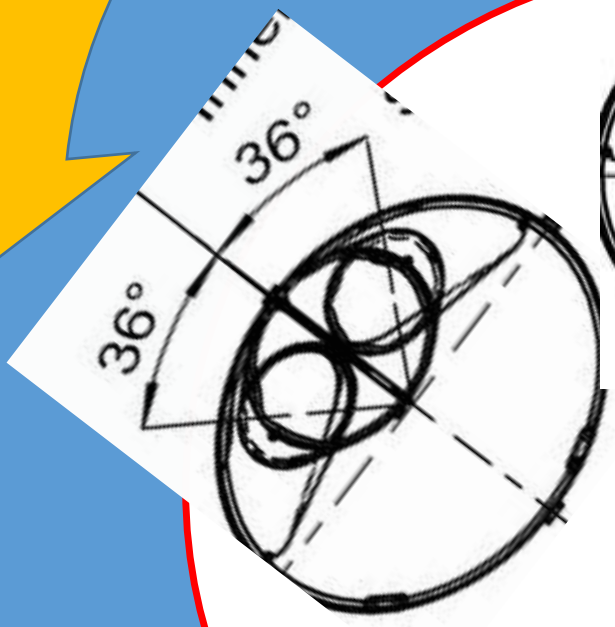
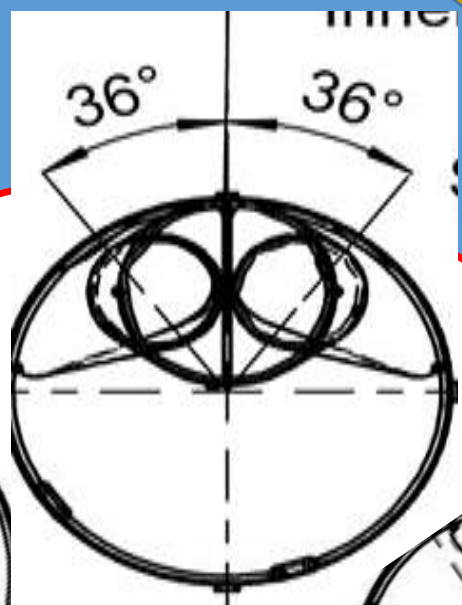
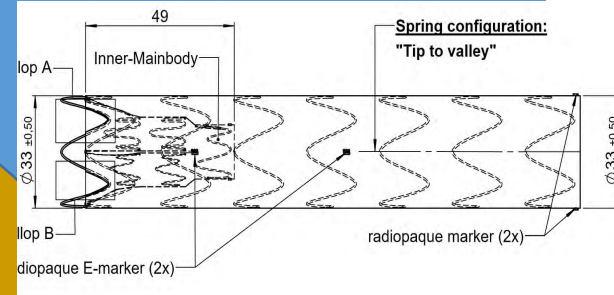
**VS.**

**Branches against  
the ostia**

**Why reversed not conventional antigrade  
?**

**Branches distal to  
the ostia**





**the branched graft can be positioned with rotation of 180 degrees distal to LSA, and thus enables liberal implantation into the curved vasculature and increases the technical feasibility for the varied and difficult arch anatomies**



# Why reversed not conventional antigrade ?

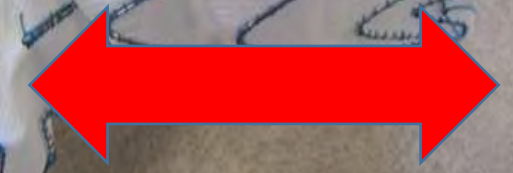
length of extension = length of the needed LZ

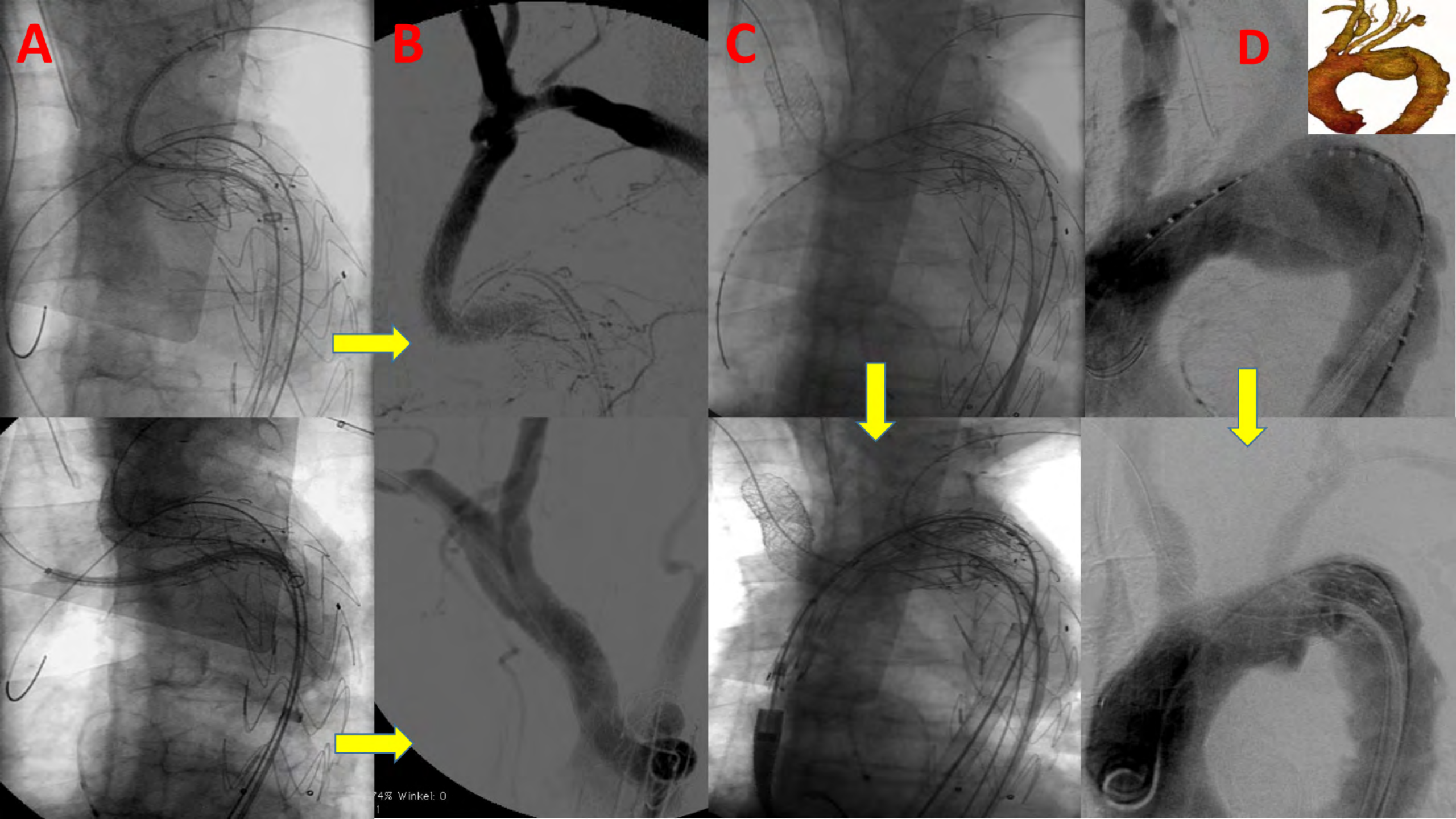
more liberal Landing

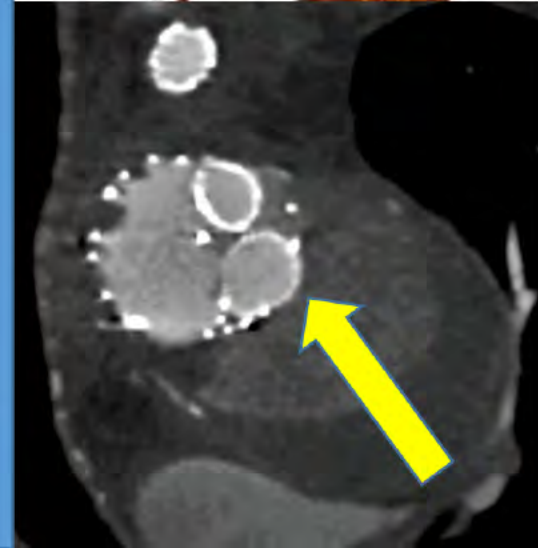
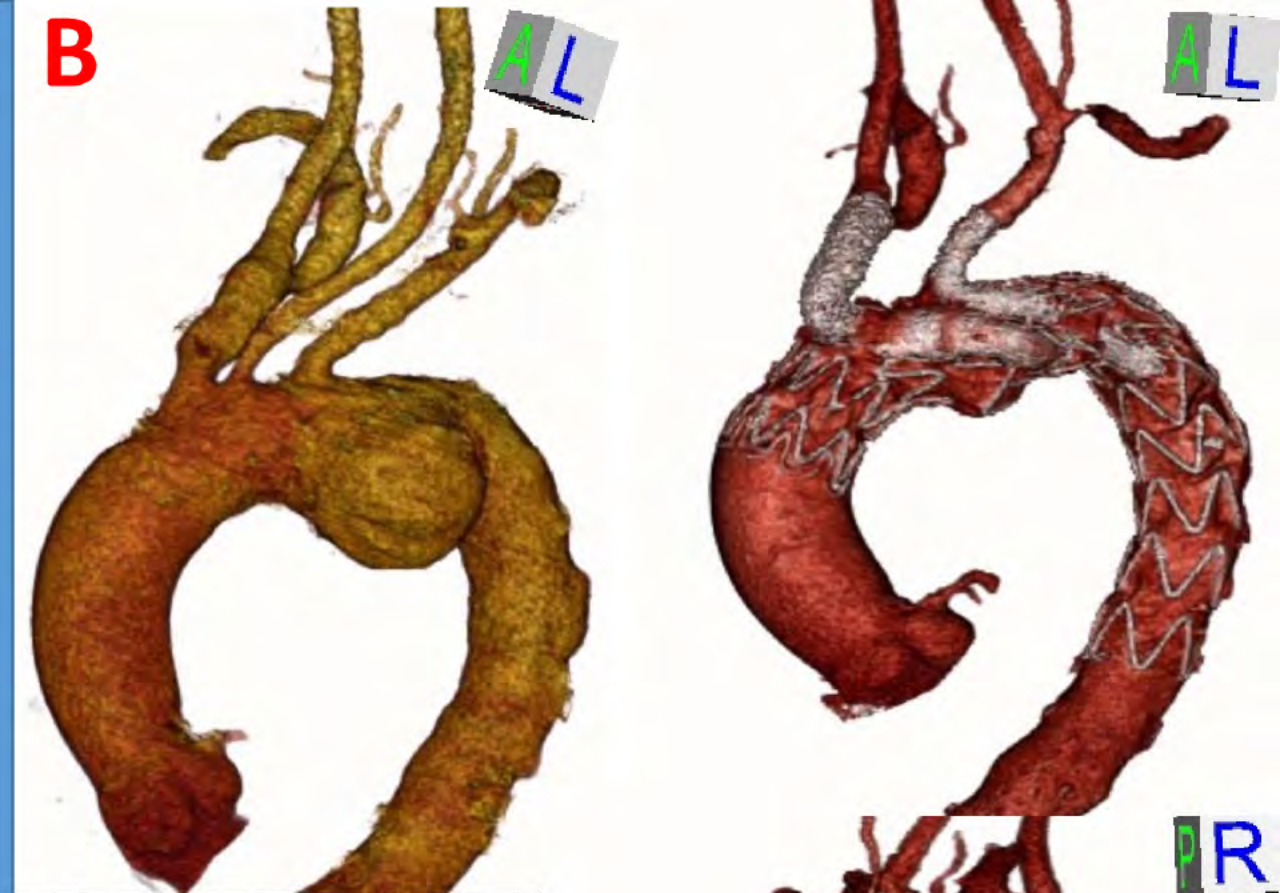
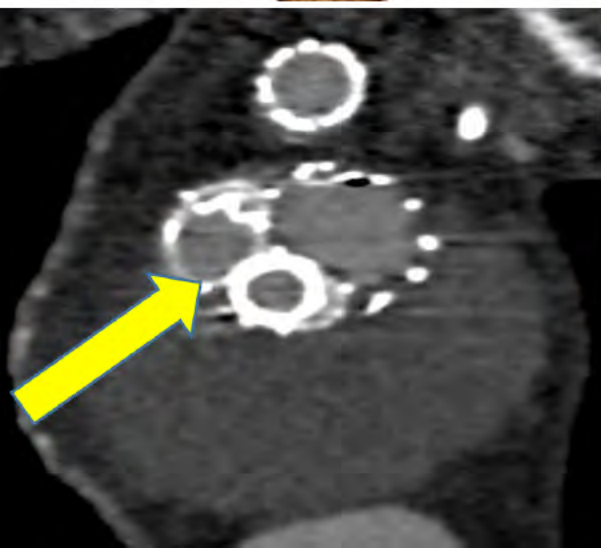
treatment of more morphologies with shorter LZ



**You don,t have to cross the valve !**

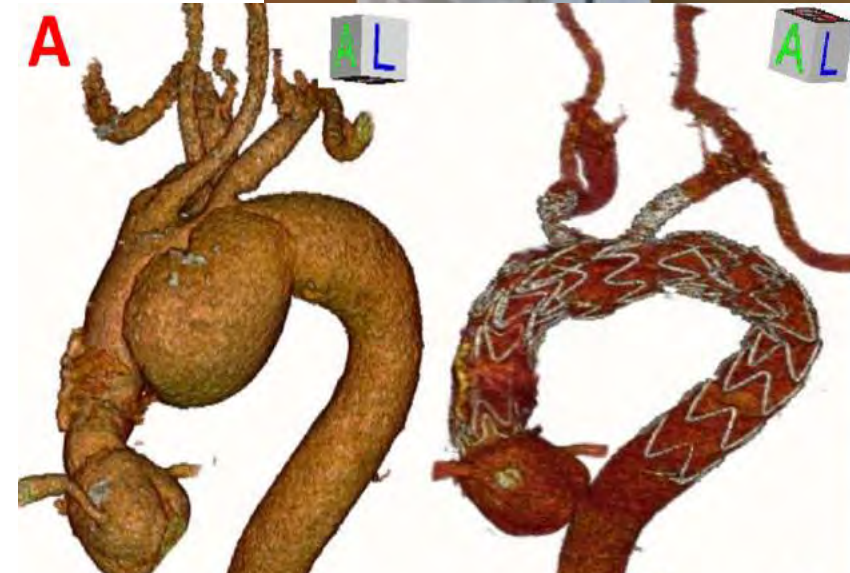






# Personal series and preliminary outcomes

- ❖ 10 Pat: 100 % technical success
- ❖ No Mortalities
- ❖ 2/ 10 major strokes
- ❖ Maximum FU (14 months)
- ❖ 2 EL Ia & III in one case, treated using graft extensions
- ❖ Ongoing study....



# Aortic arch



Thank you for your attention !



<http://domcam.bistummainz.de/>