# Advanced Imaging to guide Treatment of Chronic Aortic Dissection

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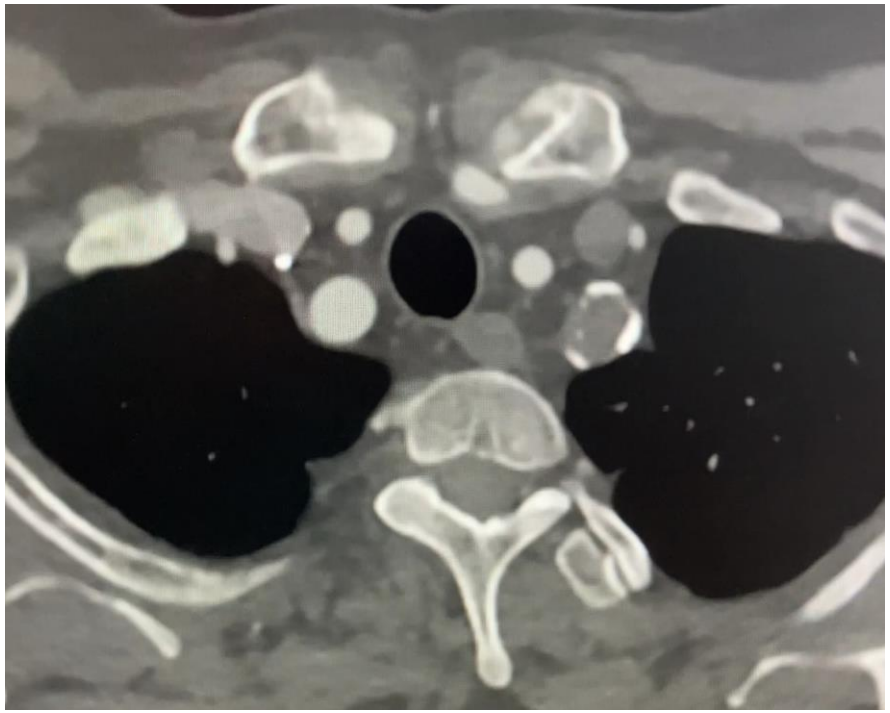
# Conflicts of interest

- I have no conflict of interests related to this presentation
- Funded Fellowship (Swiss National Science Foundation)

Swiss National
Science Foundation

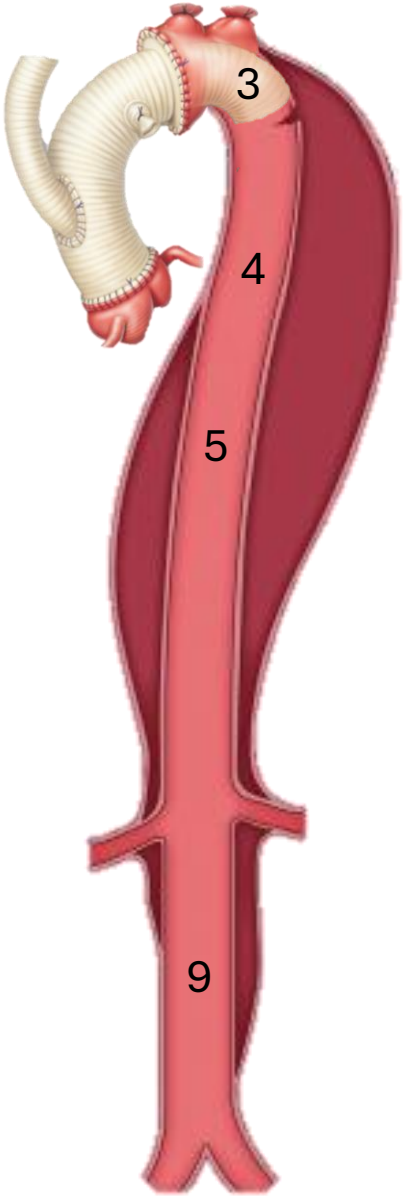
# Patient History

- 48y old male, Marfan-Syndrome
- 1996: Composite graft (aortic valve + ascending graft) for acute Stanford type A dissection, DeBakey type 1, (SVS Zone 0 – 9)
- 2012: Elective elephant trunk procedure with total debranching for secondary arch aneurysm
- 2024: Recurrent thoracic pain → CT-scan



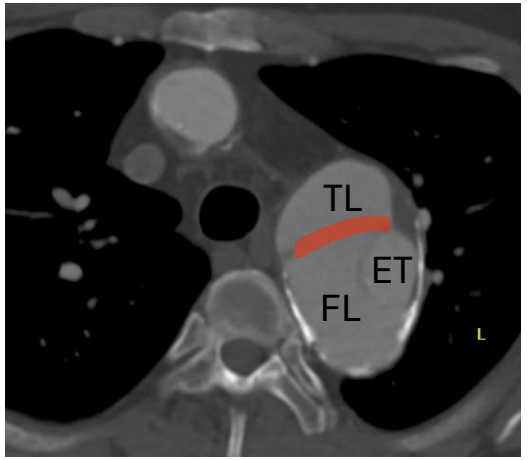
# Anatomical Situation I

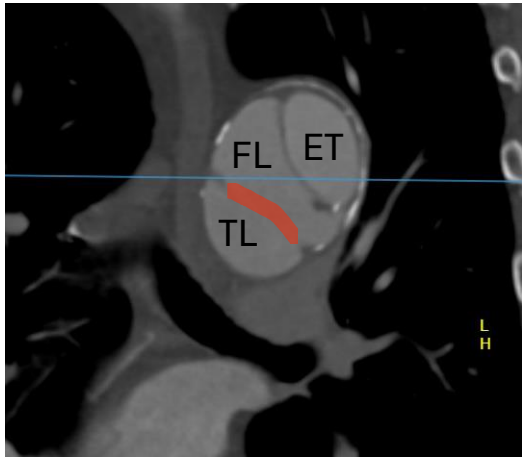
- Chronic residual aortic dissection zone 3 – 9
  - Increasing diameter in zone 3-4: 6.4 cm
  - Stable diameter in zone 5 - 9: 4.7  - 3.6 cm
  - Stable left common iliac aneurysm 3.7 cm

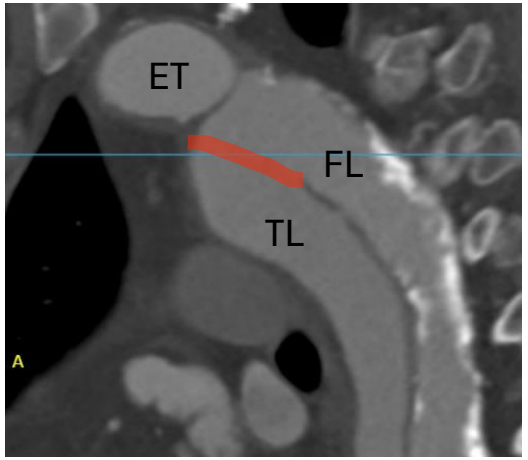


# Anatomical Situation II

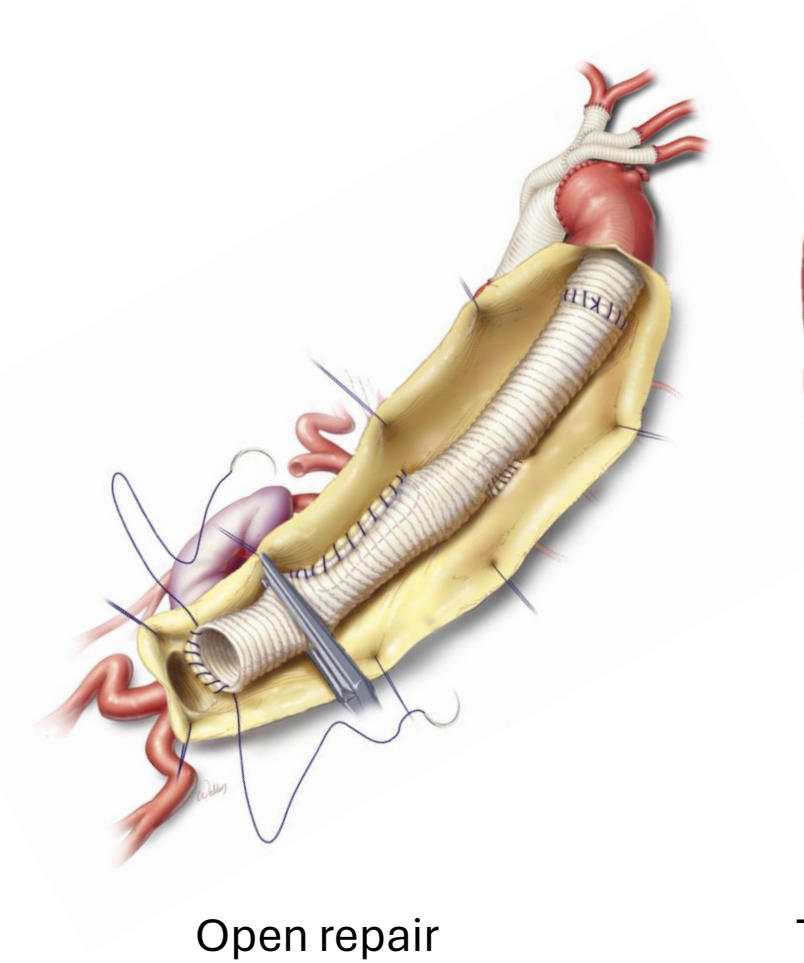
- Large proximal entry in (Zone 3) – surgical entry?
- Multiple smaller entries in thoraco-abdominal aorta
- True lumen, relatively small: CT, SMA, RRA
- False lumen, large with heavy calcifications: LRA



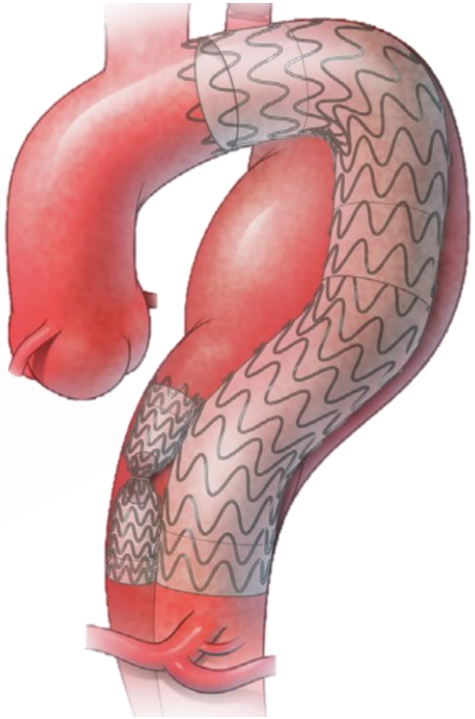



# Treatment Options



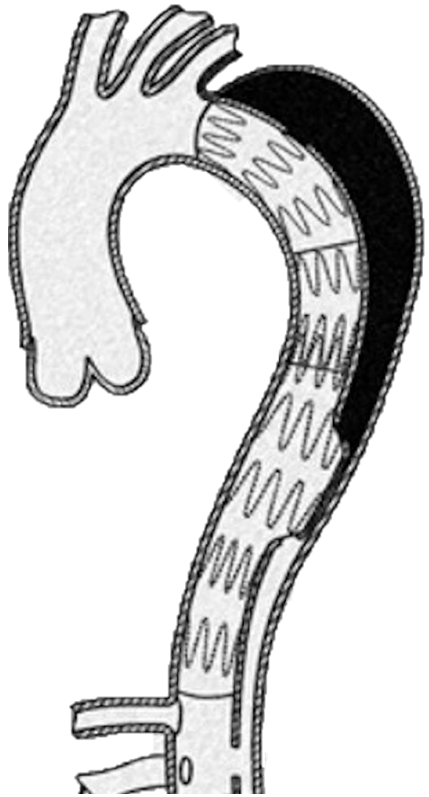
Open repair

Coselli et al.



TEVAR + candy plug

Miles et al.
(Kölbel T)



Knickerbocker-TEVAR

Rohlffs et al.
(Kölbel T)

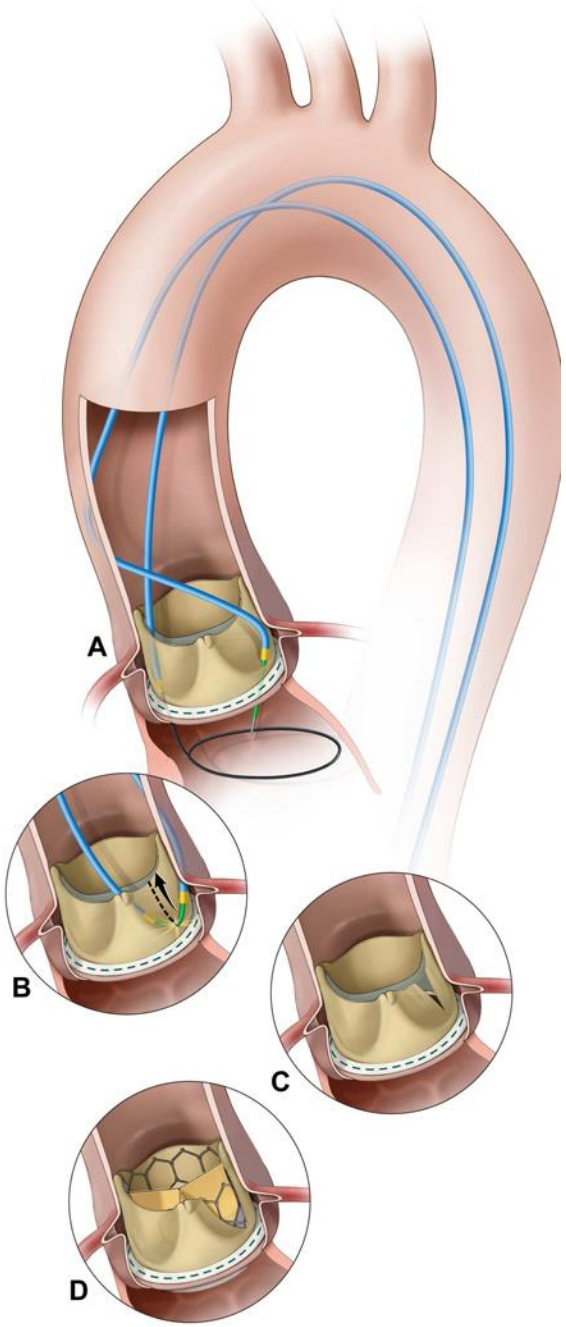
BASILICA & TEVAR

Baghbani-Oskouei et al.
(Oderich G)

# BASILICA Technique

**B**ioprosthetic or native **a**ortic **s**callop **i**ntentional **l**aceration to prevent **i**atrogenic **c**oronary **a**rtery obstruction during TAVR

→ Transcatheter electrosurgery before TAVR to lacerate the offending aortic leaflet(s) and maintain coronary perfusion after TAVR.




Kahn JM (2018): DOI: 10.1016/j.jcin.2018.01.247

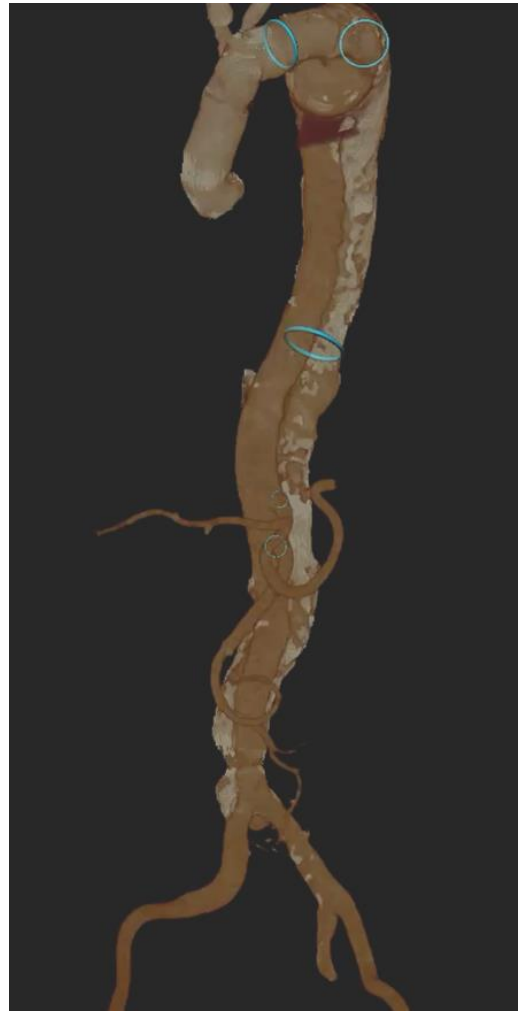
# Plan: BASILICA & TEVAR in descending Aorta

1. Identification of True / False Lumen
   - Philips CT-fusion (VesselNavigator)
   - Philips IVUS (Volcano)
2. Electro septotomy in descending aorta (Zone 3 – 5)
   - Surgeon modified through-and-through wire
3. TEVAR from elephant trunk (32 mm) to supracoeliac aorta (≈ 40mm)

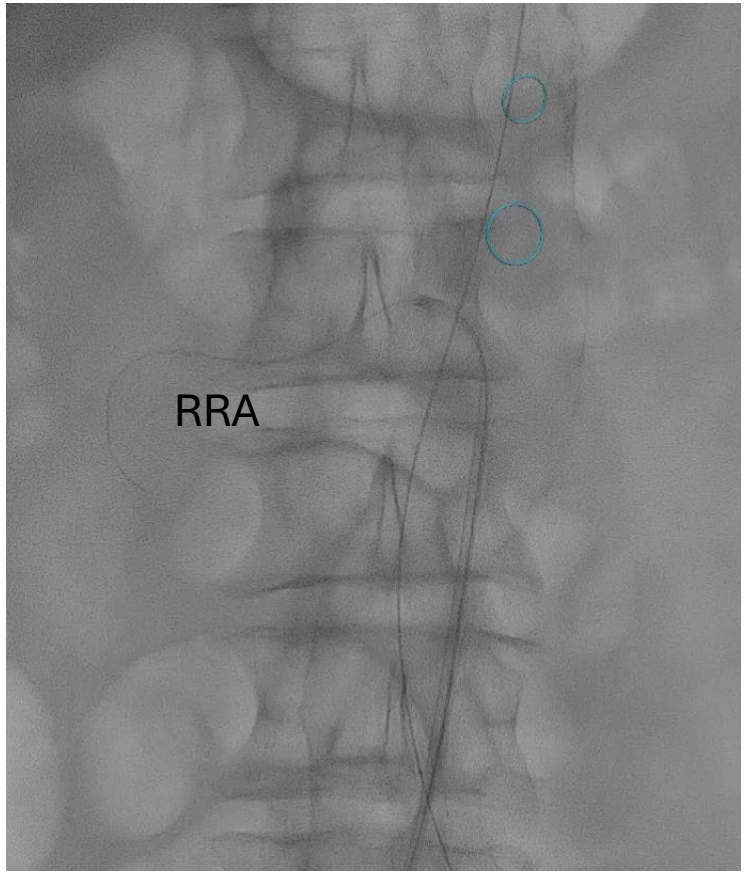
Philips IVUS

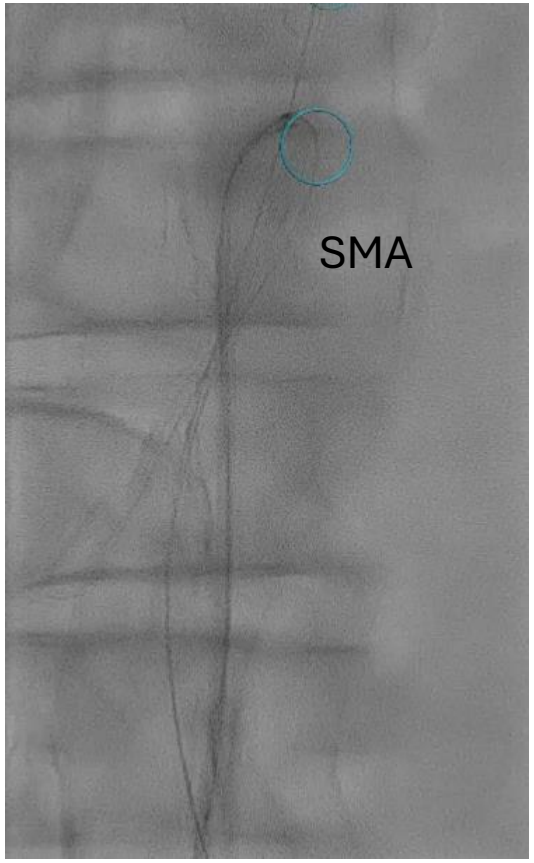
# Setup

- Main access via right CFA: 24F
- Left CFA access: 10F
  - IVUS: Volcano Vision PV .035 (8.2 F)
- Right radial access: 5F
  - Diagnostic catheter + elephant trunk identification

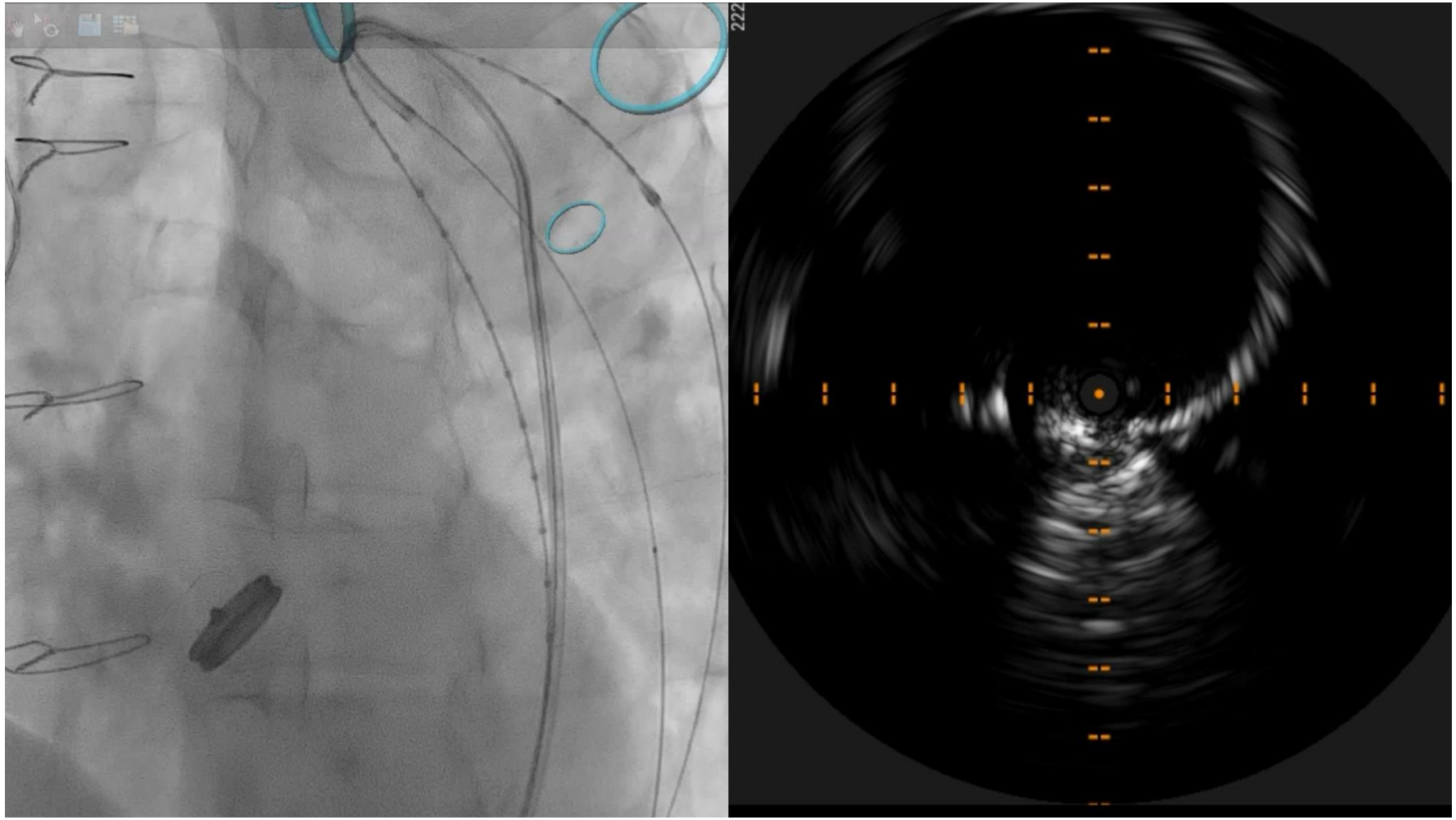


# True Lumen Identification + Fusion Alignment

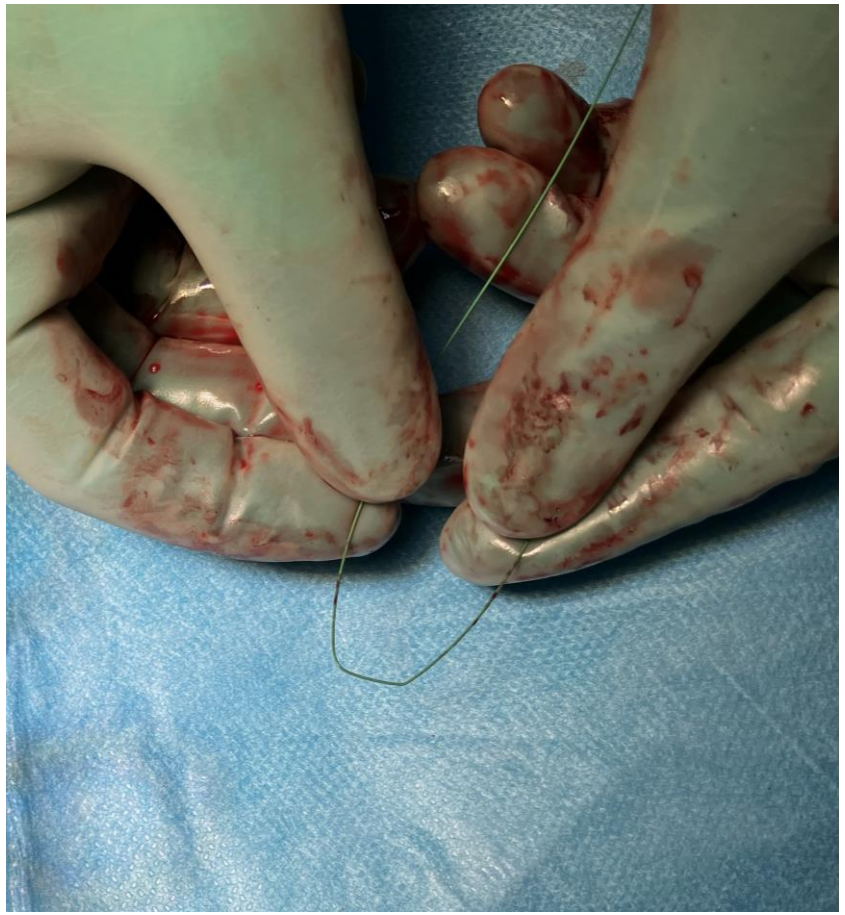


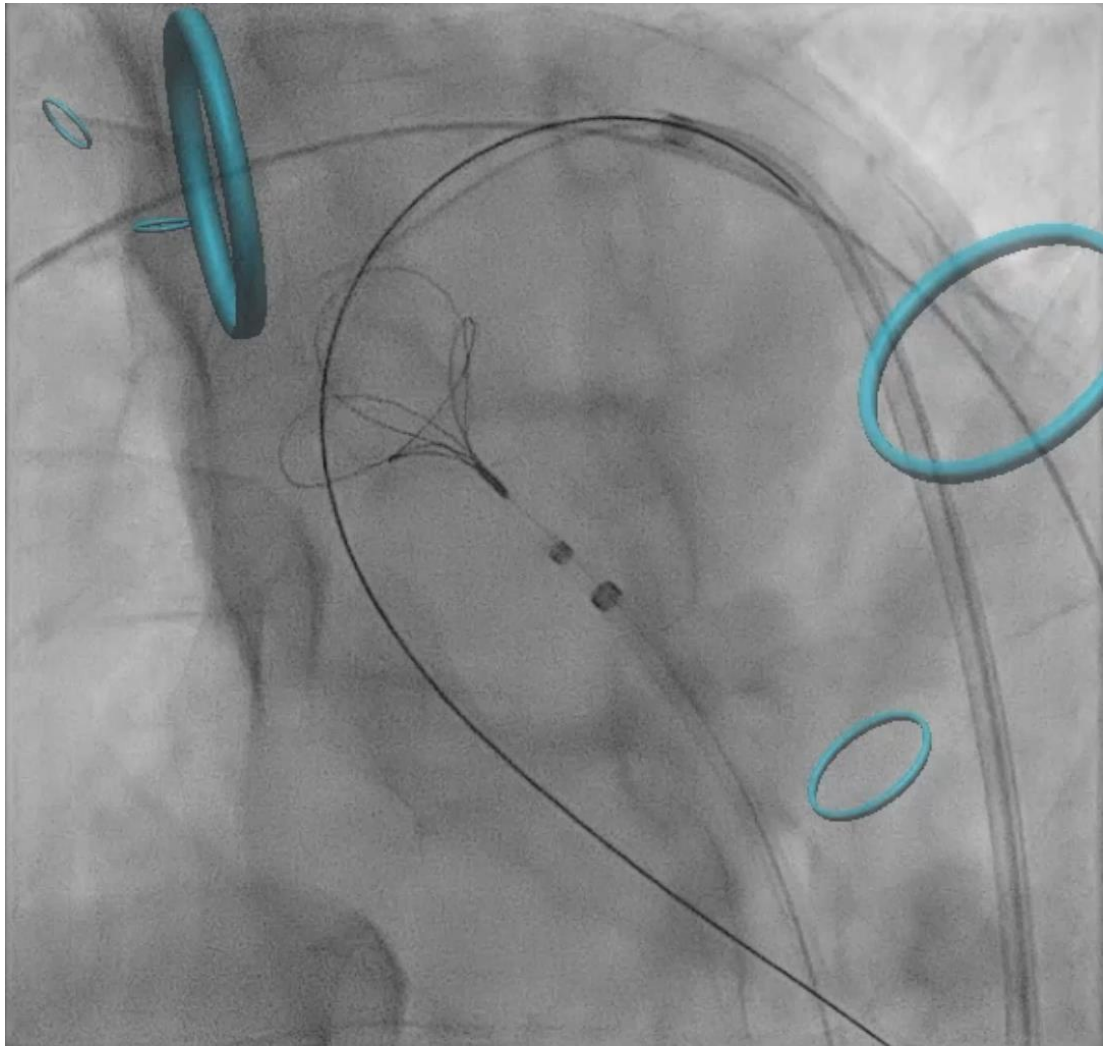
# Verification of Proximal Entry Cannulation



# Modification of Astato .018 Wire

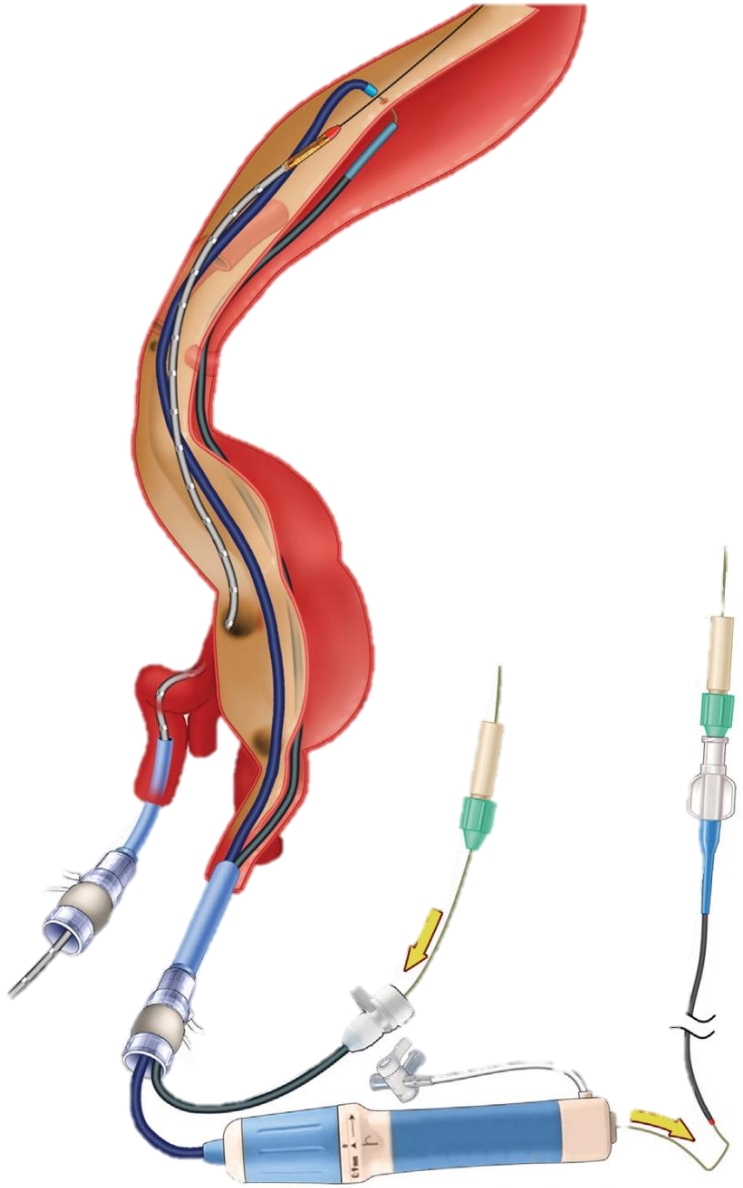


# Through and through Wire (Astato)

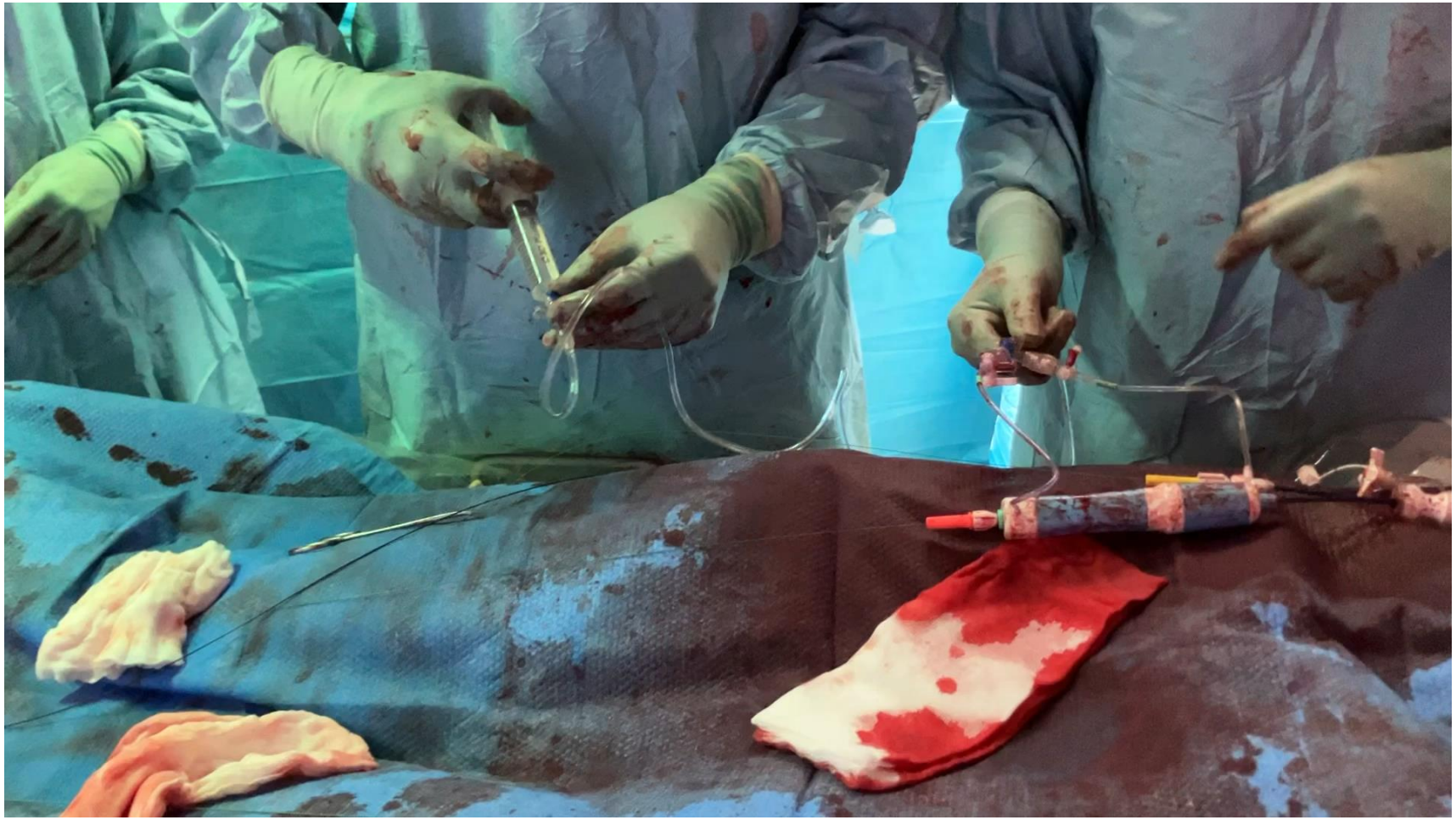


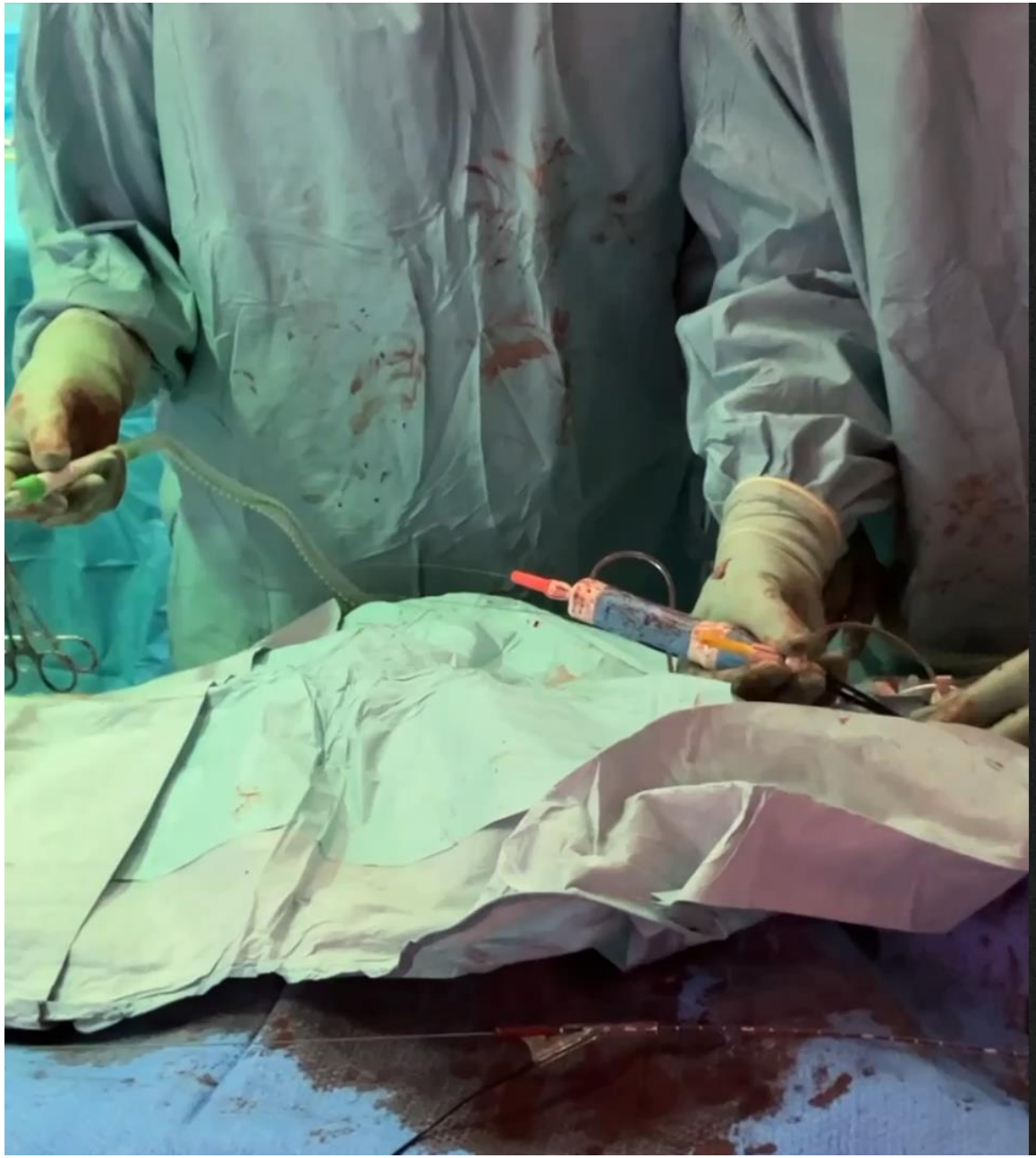
# Septotomy

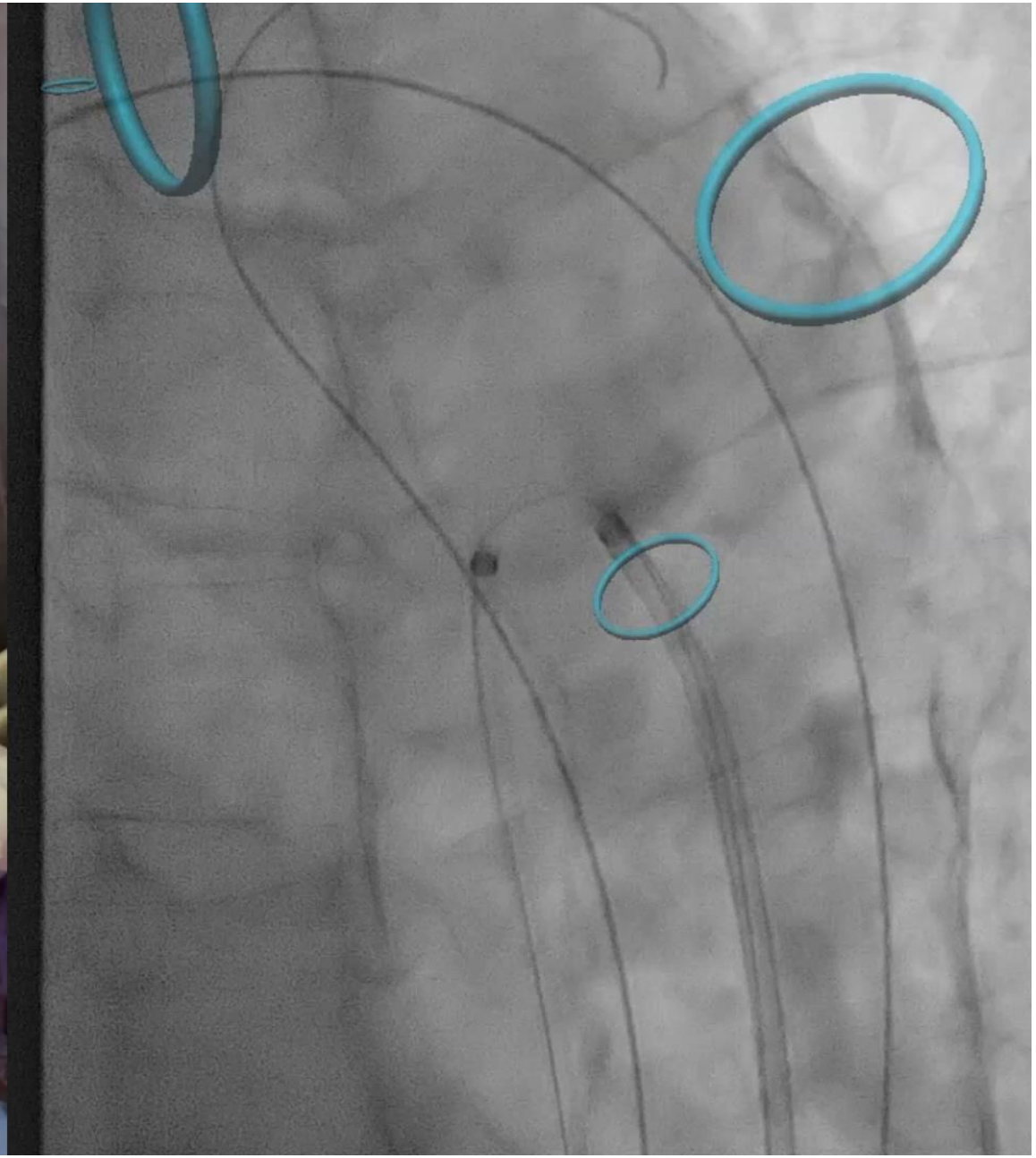
- Right CFA: 24F DrySeal sheath
  - 6.5F Aptus TourGuide steerable sheath
  - 6F Cook Flexor Ansel
  - (2x NaviCross 0.018” support catheter)
  - Modified Astato 30, 300cm 0.018” wire
  - Pressure flush with 5% glucose via both sheaths
- Left CFA access: 10F
  - IVUS: Volcano Vision PV .035 (8.2 F)



# Septotomy - Preparation







# TEVAR

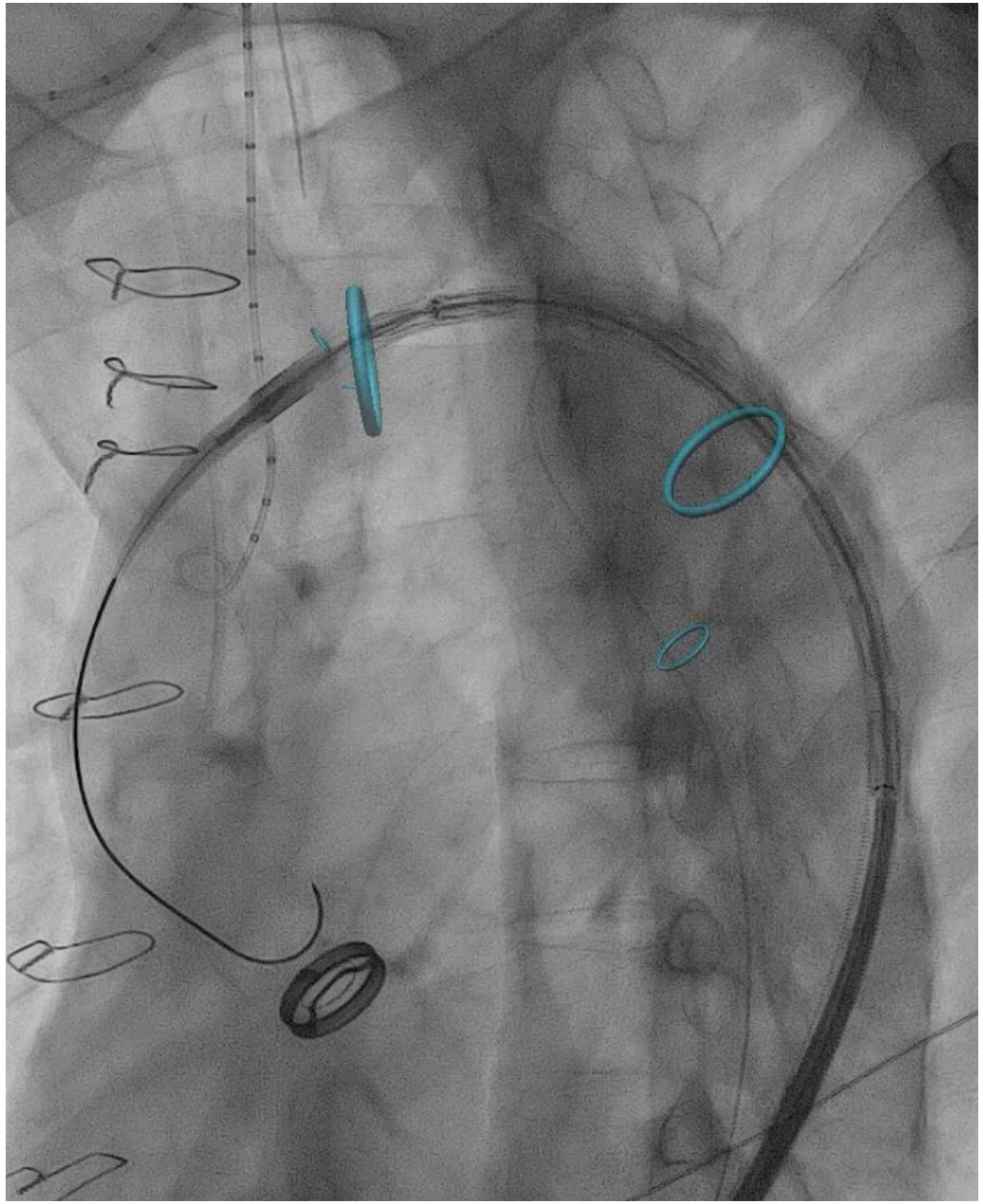
- Proximal: Elephant trunk
- Distal: Zone 5 ‘neo-lumen’
- Deployment during valsalva

1. Cook Zenith Alpha ZTA-P

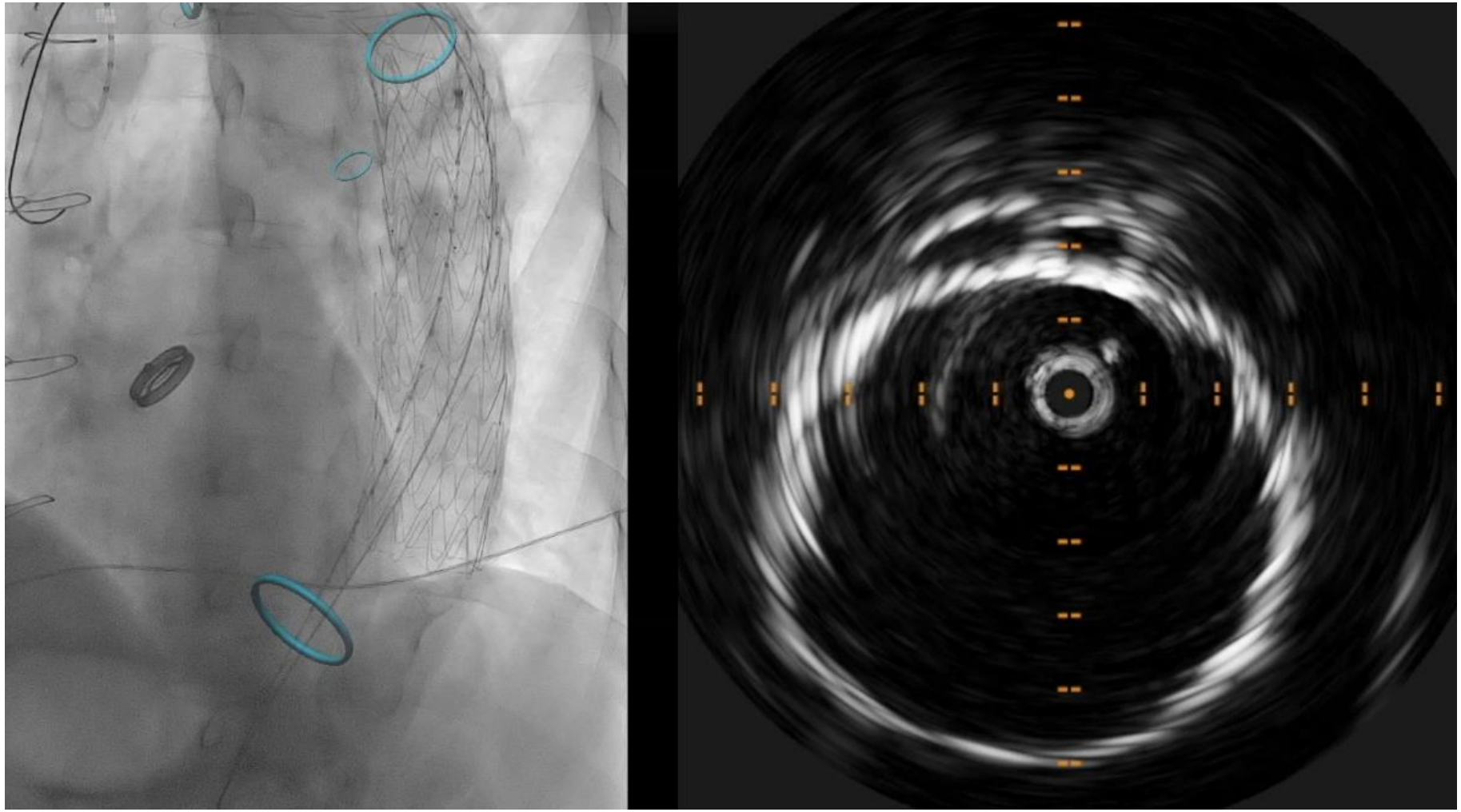
   34 – 34 – 161 mm

2. GORE cTAG

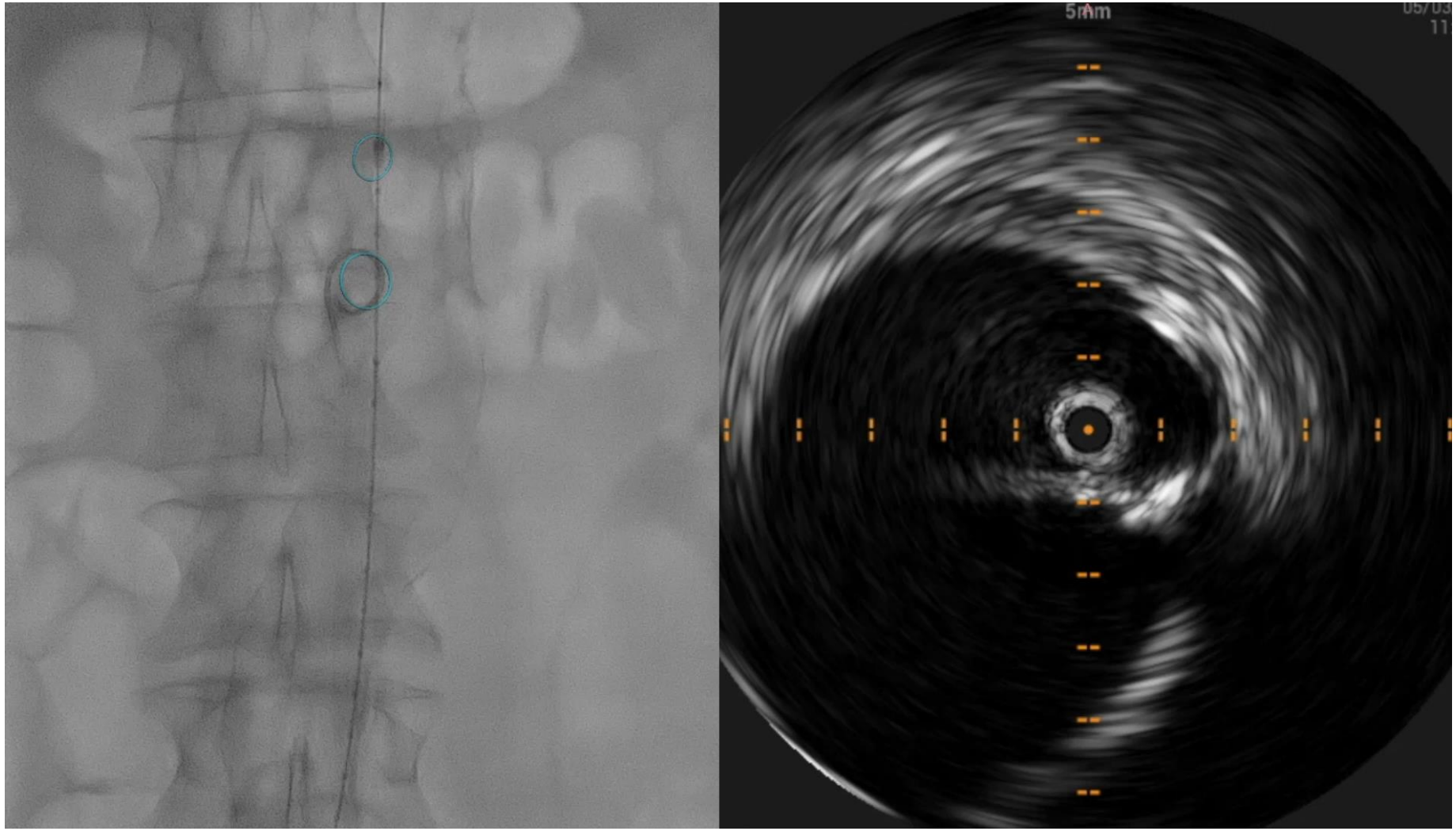
   45 – 45 – 200 mm



# Final Control with IVUS + VesselNavigator

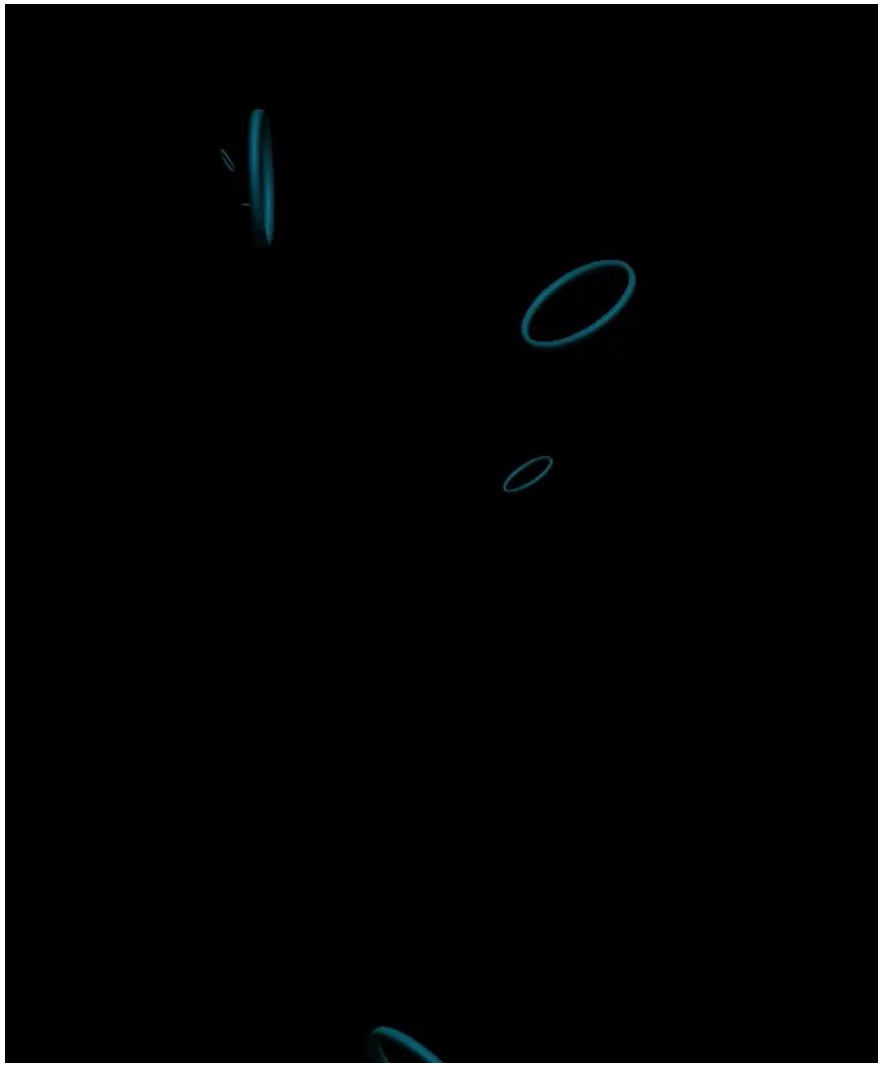


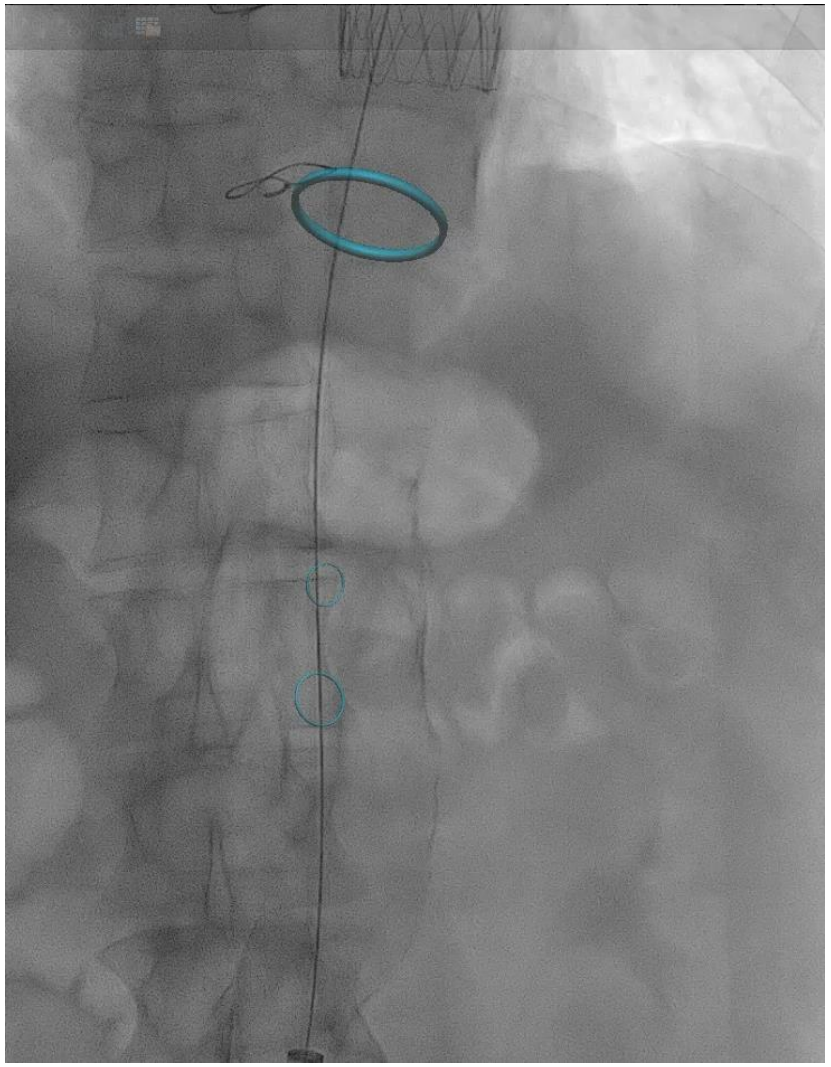
# Final Control with IVUS + VesselNavigator

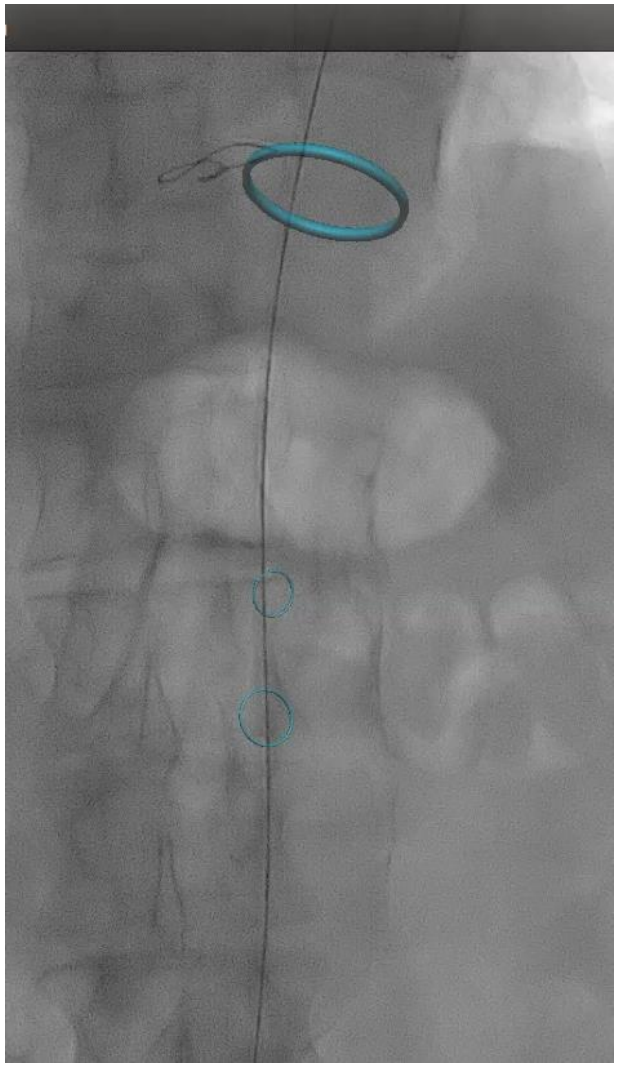


1.5x speed

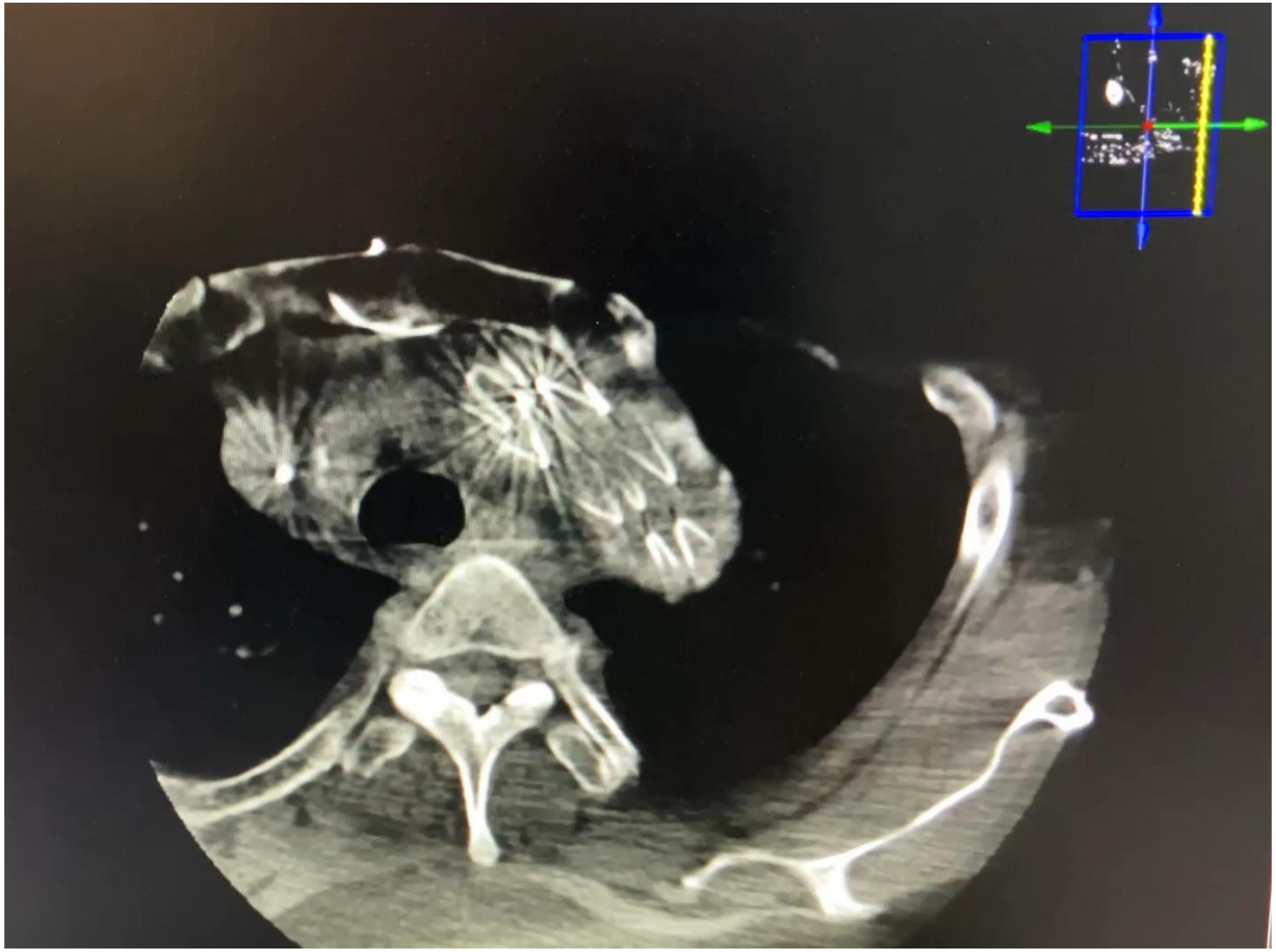
# Final Control with Angiography



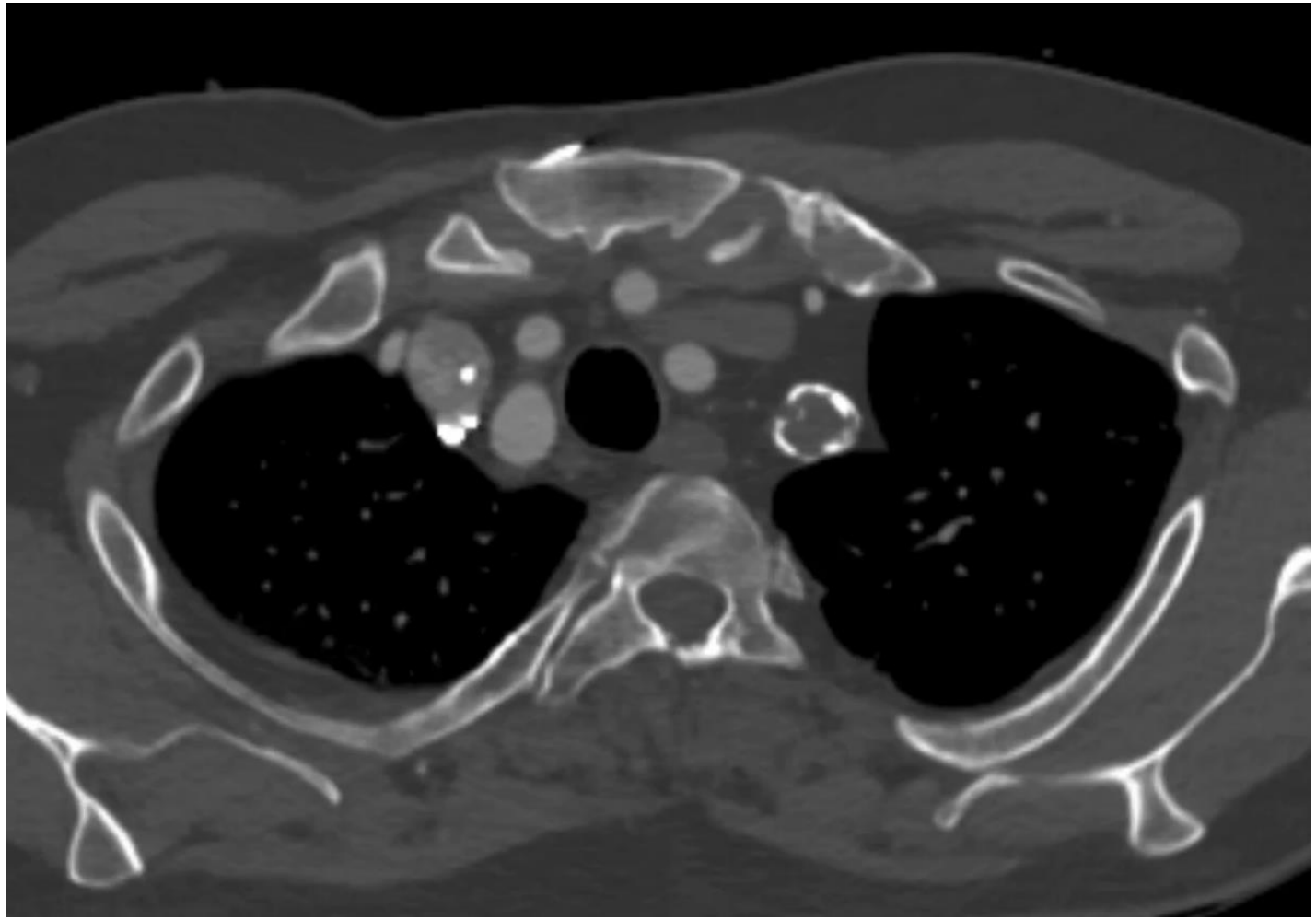




# Completion Cone-Beam CT-scan

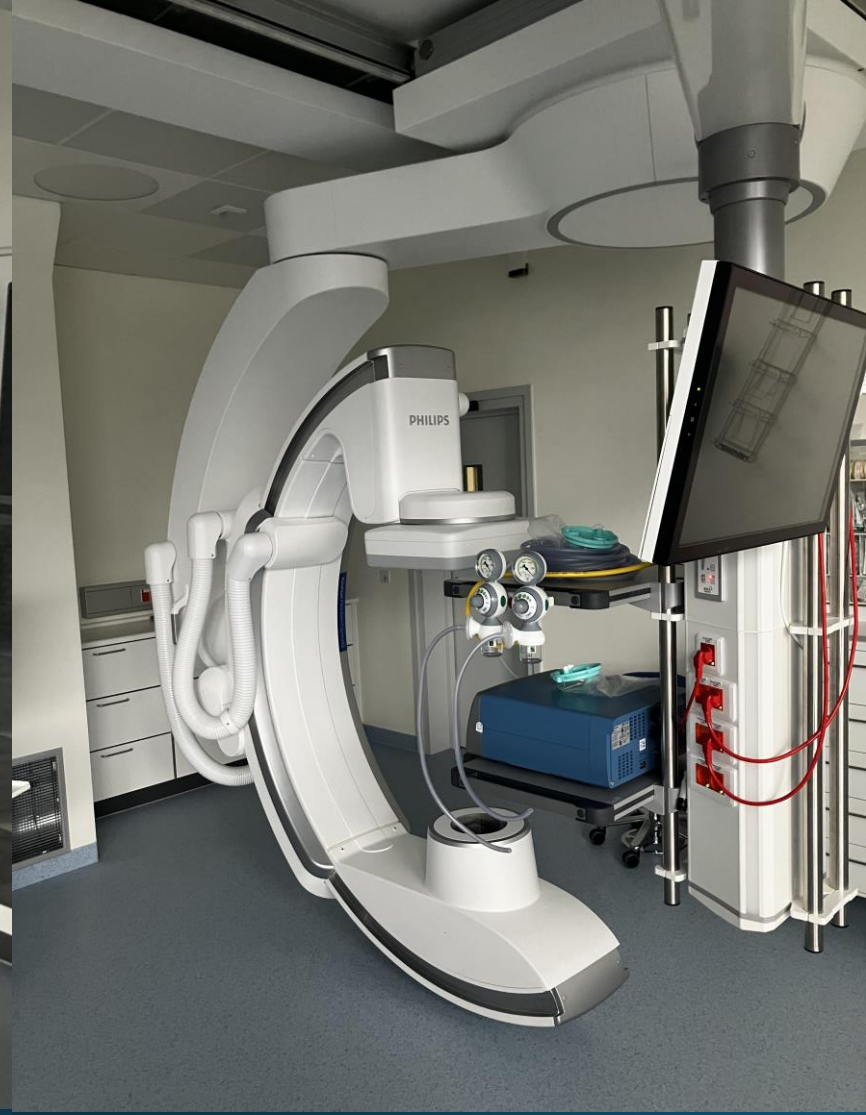


# CTA on 1st postoperative day, before discharge



# Conclusion

- Complex aortic surgery highly benefits from advanced and multimodal images
- Combined imaging (IVUS, CT-Fusion, X-ray, Angiography) might facilitate complex procedures, increases safety and reduce use of contrast medium and radiation
- IVUS helps live localisation of dissection membrane, entries and vessel origins




# Thank you for your attention

New Philips hybrid room at

Rigshospitalet

Copenhagen, Denmark