Aortic Arch Aneurysms

Open and Endovascular Techniques

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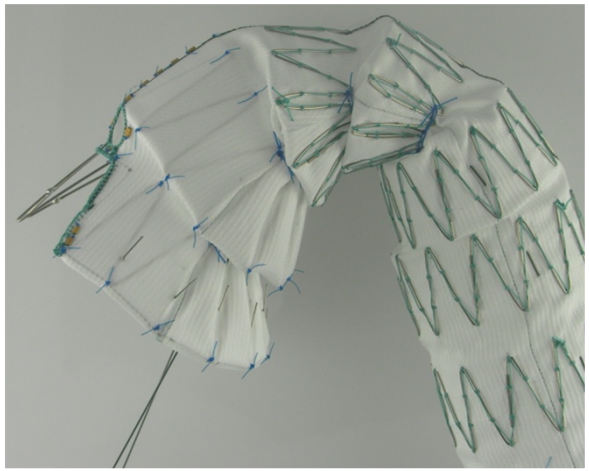
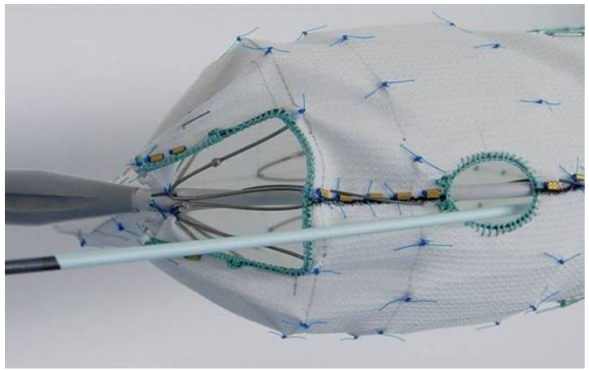
Universitaire de Lille

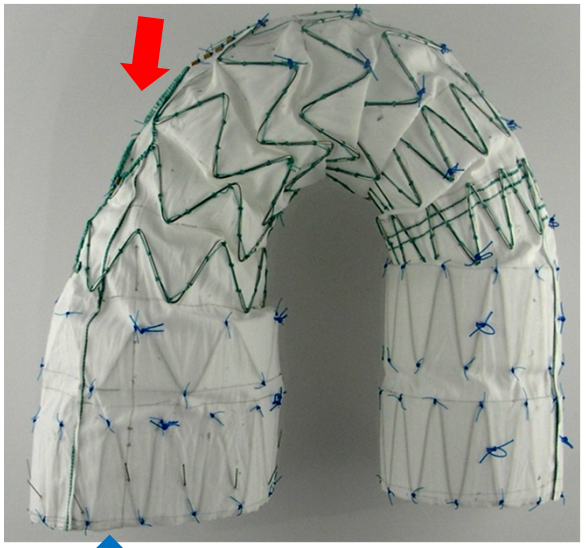
Disclosures

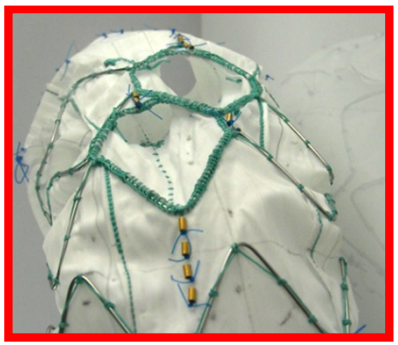
- Research support, Consulting
  - Cook Med, GE Healthcare

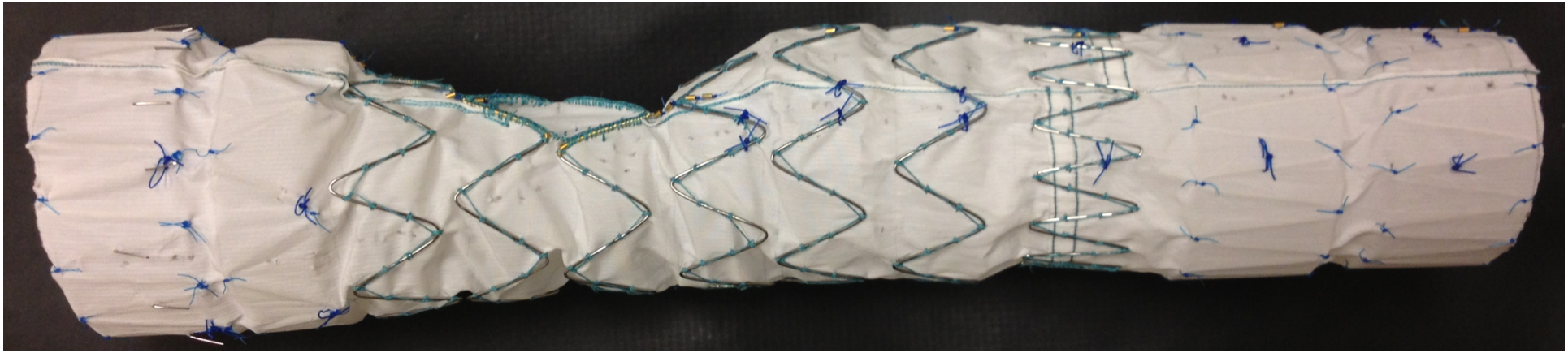
Arch Branch Device Evolution

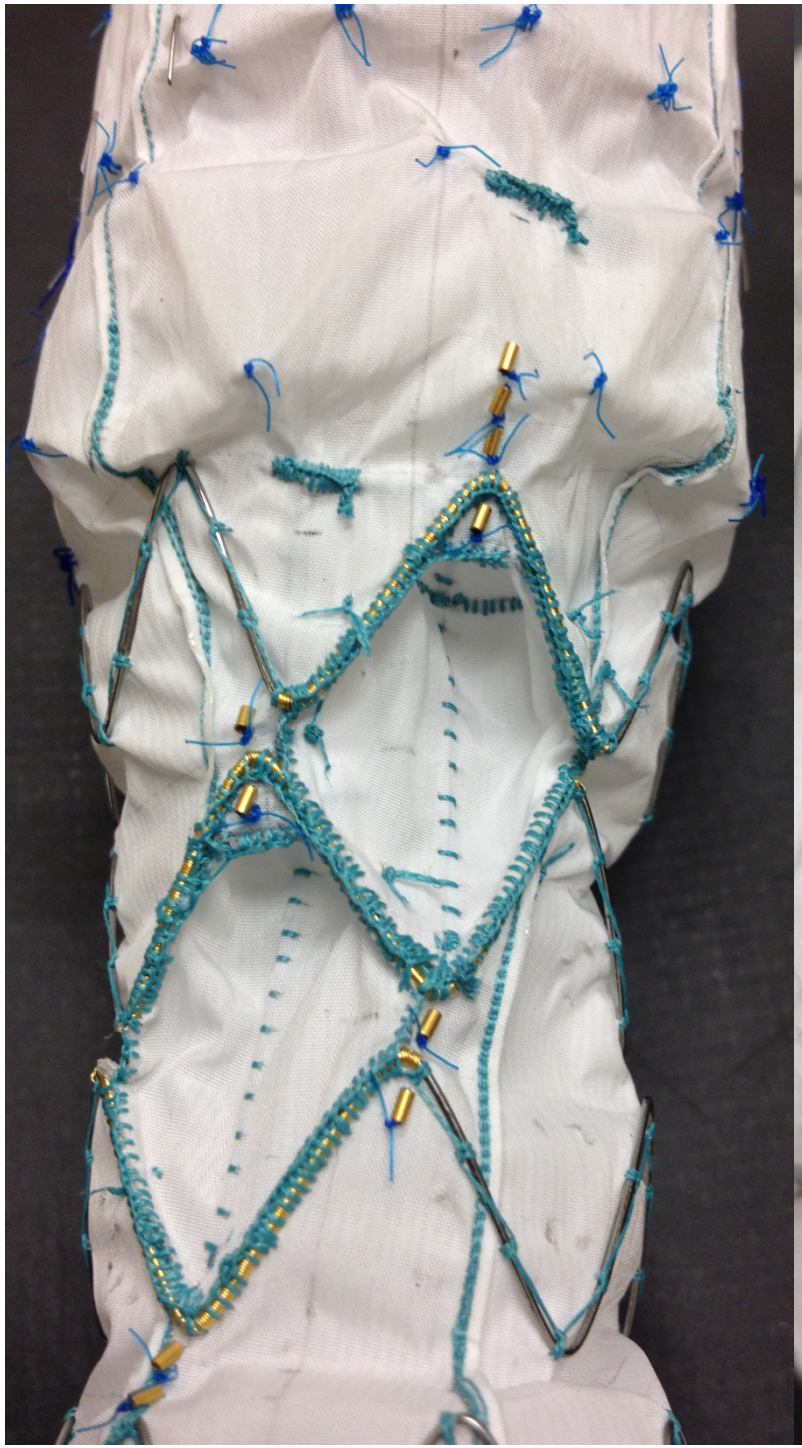


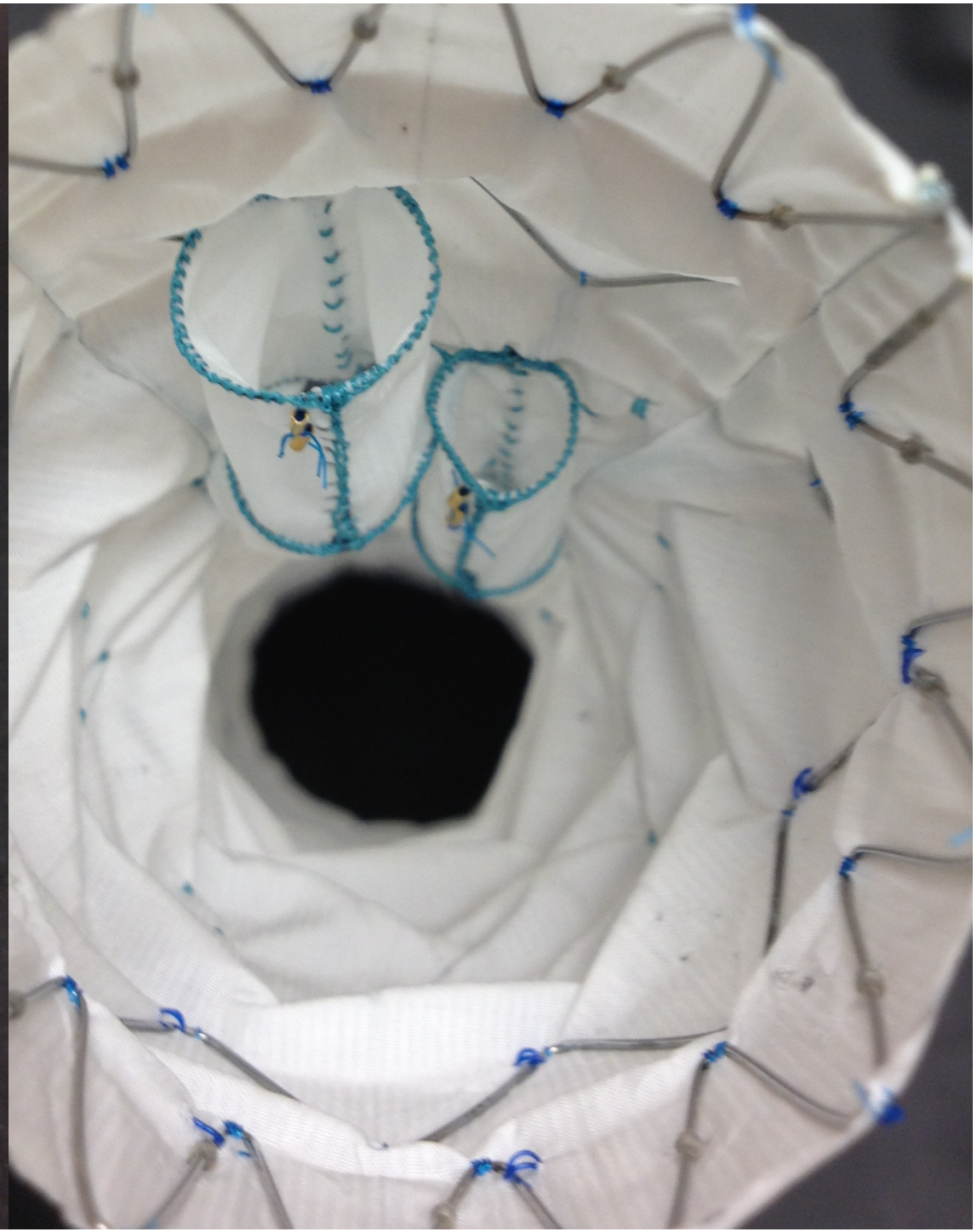


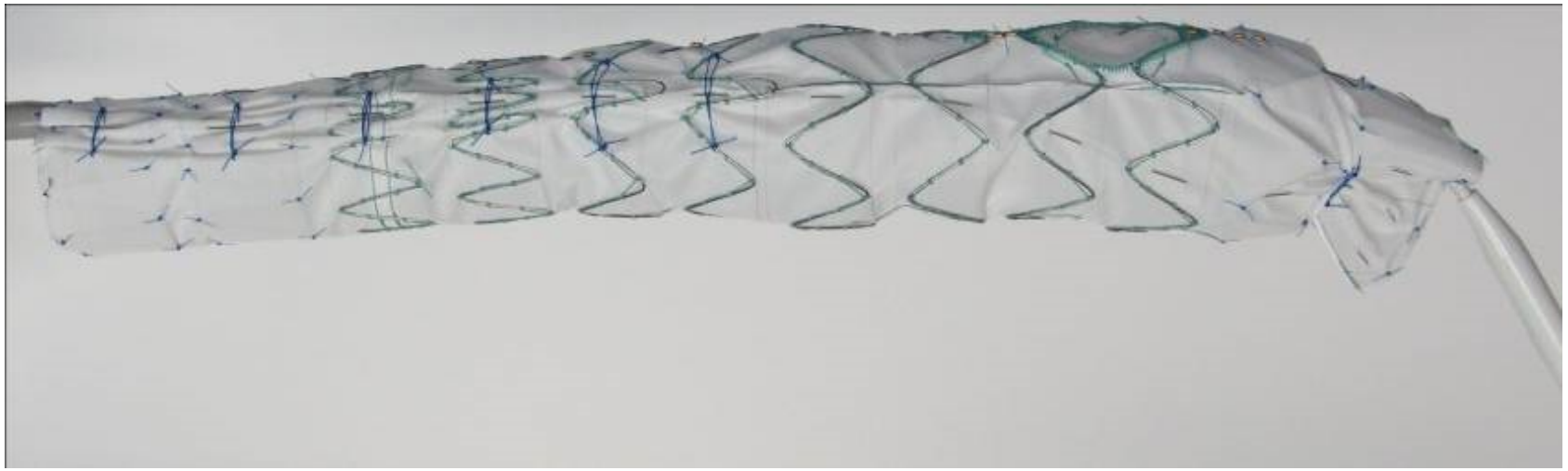


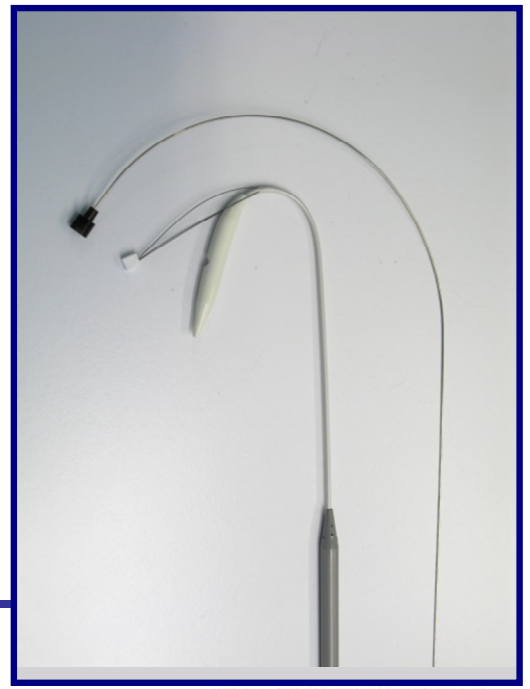












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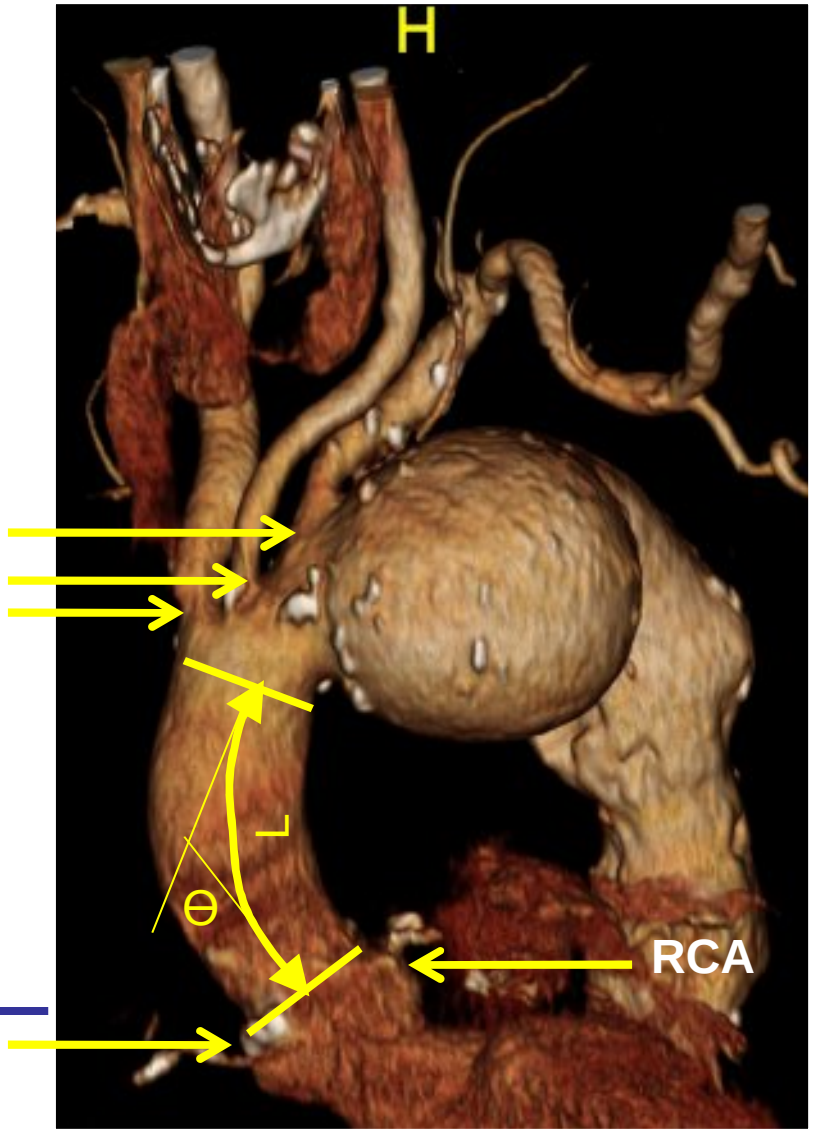
Ascending Aorta and Arch

	Length (L)	Angle (Θ)
Moon et al[1]	70.5 ± 1.8 mm	N/A
Sobocinski et al[2]	80.5 mm	N/A
TAA patients[3]	7.6 ± 0.8 mm	41.1 ± 6.1 °

- Ascending Aorta
  - Short
  - Angulated
- Branch Vessels
  - Dire consequences of inaccurate deployment
- Aortic Valve
  - Wire and delivery system tip must traverse aortic valve



1. Moon M. et al. J Vasc Surg 2011: 53(4):942-9.
2. Sobocinski et al. EJVES 2011
3. Cook internal data

GE DISCOVERY IGS 730

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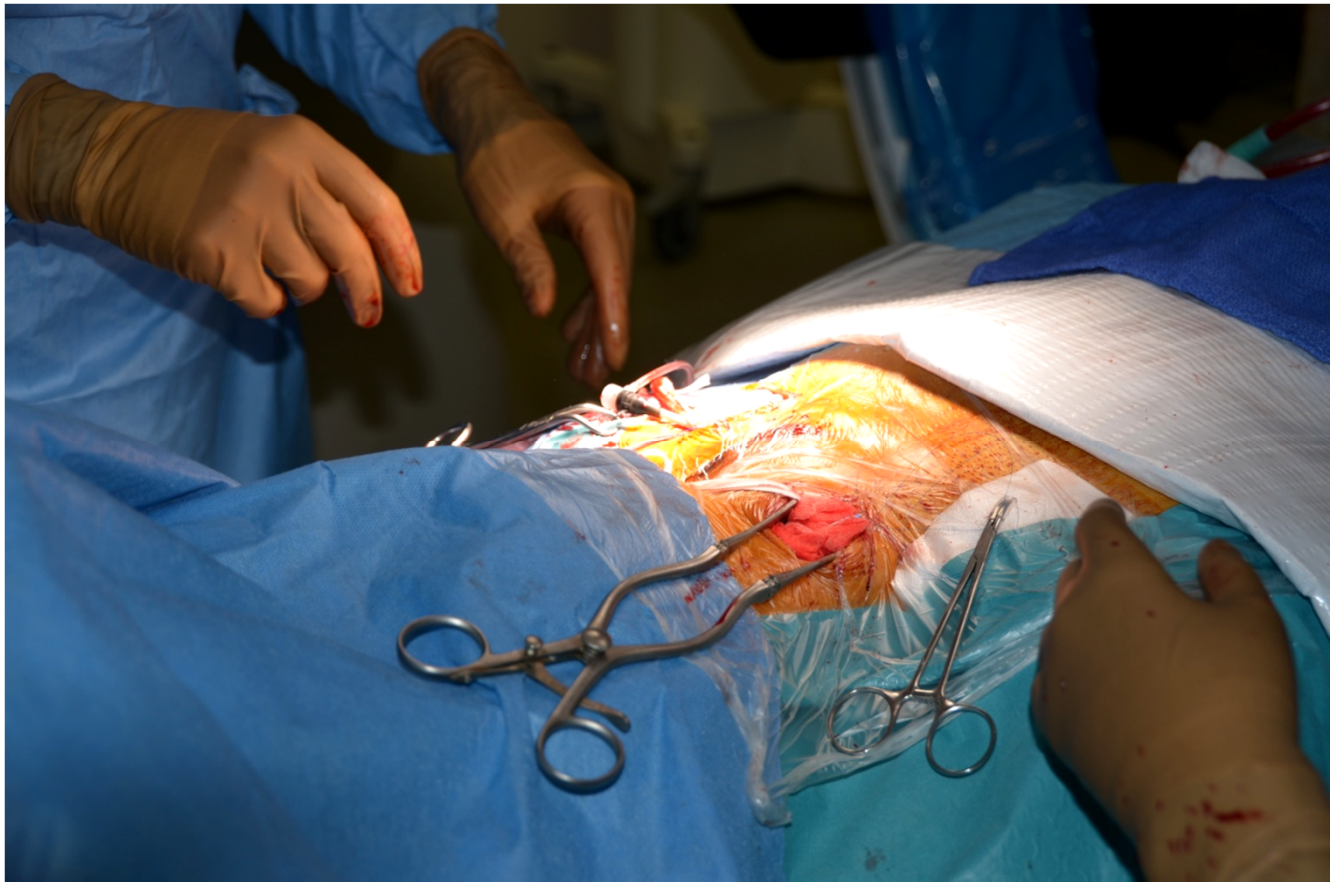
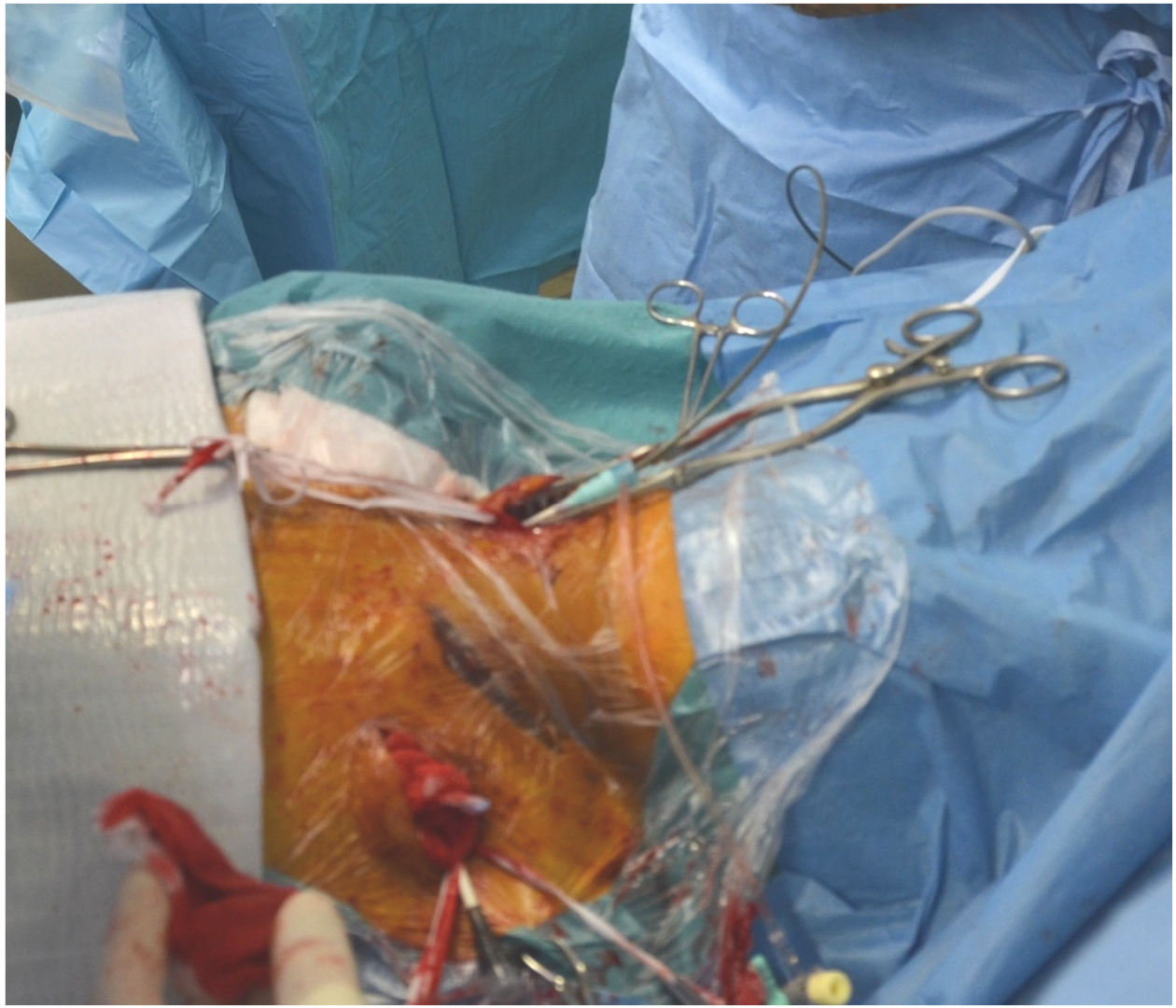
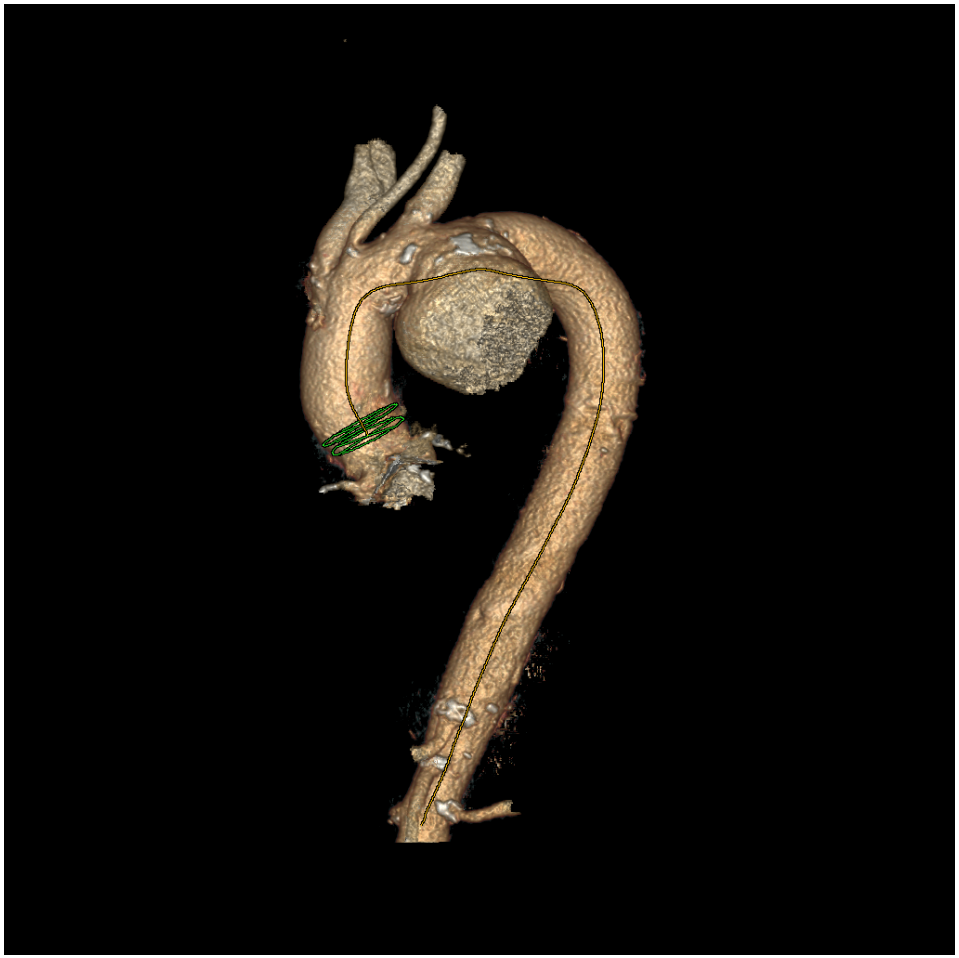
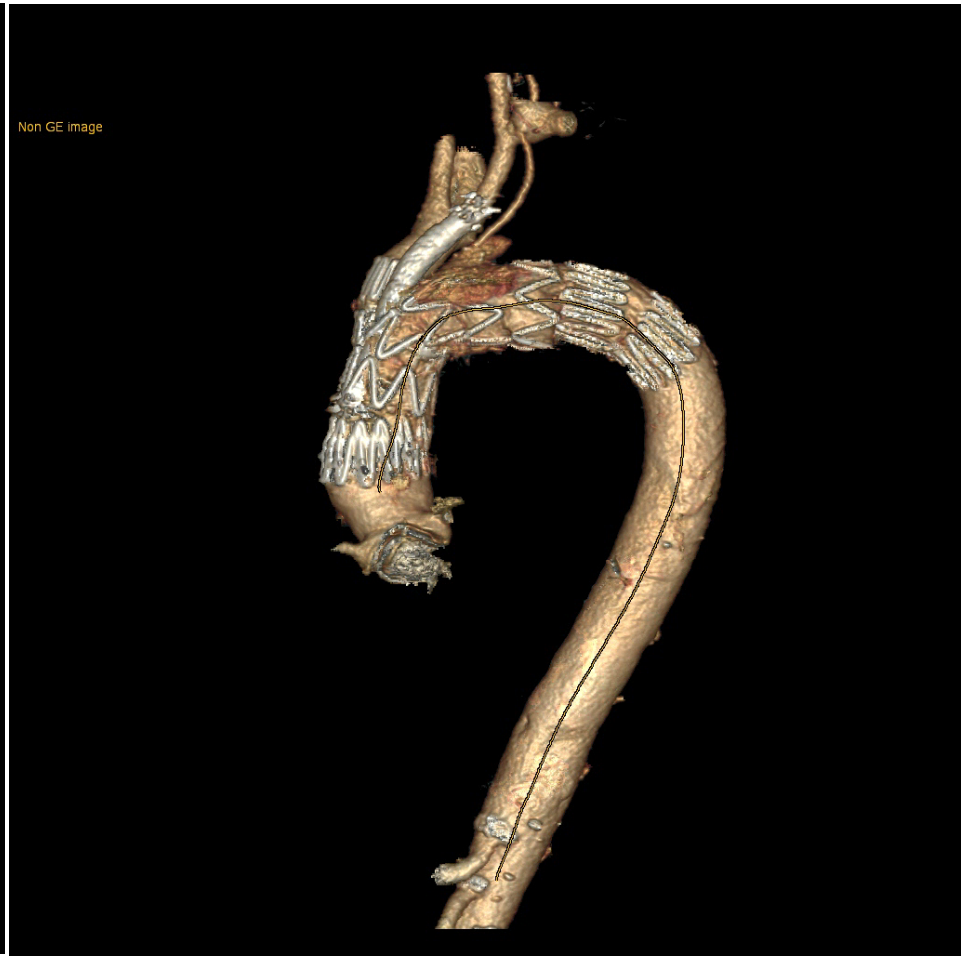
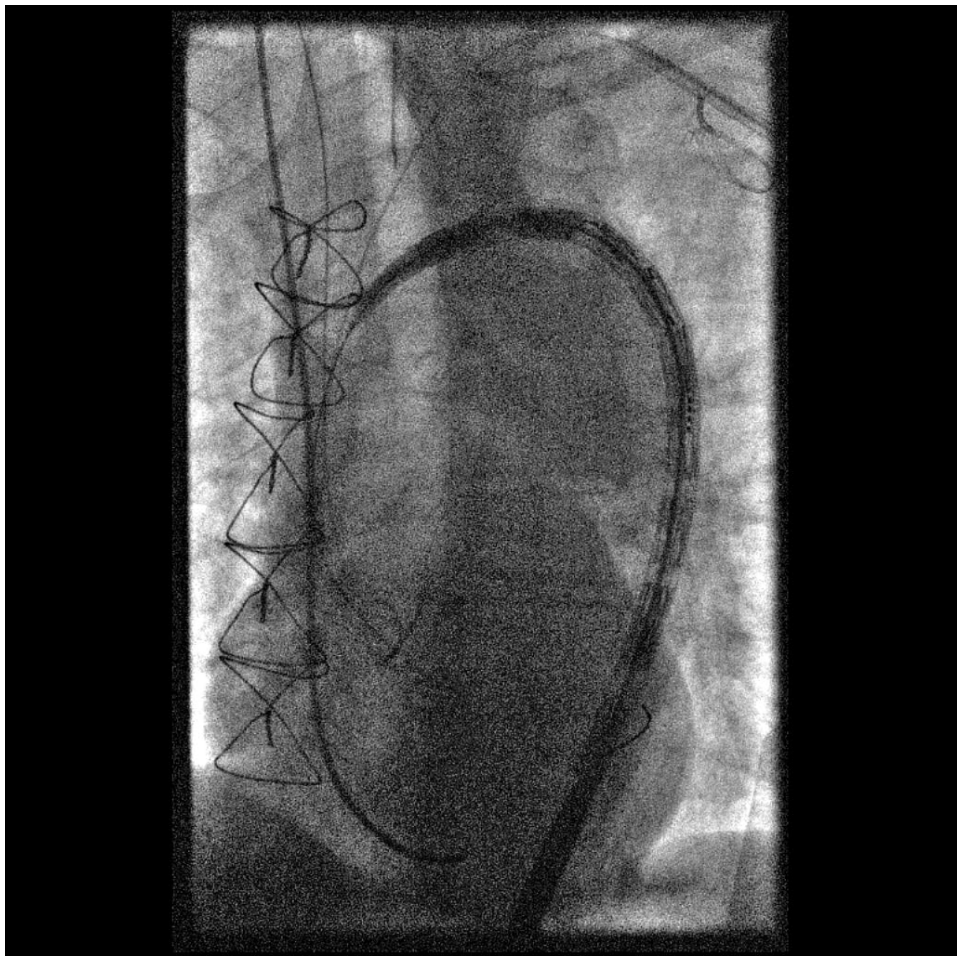
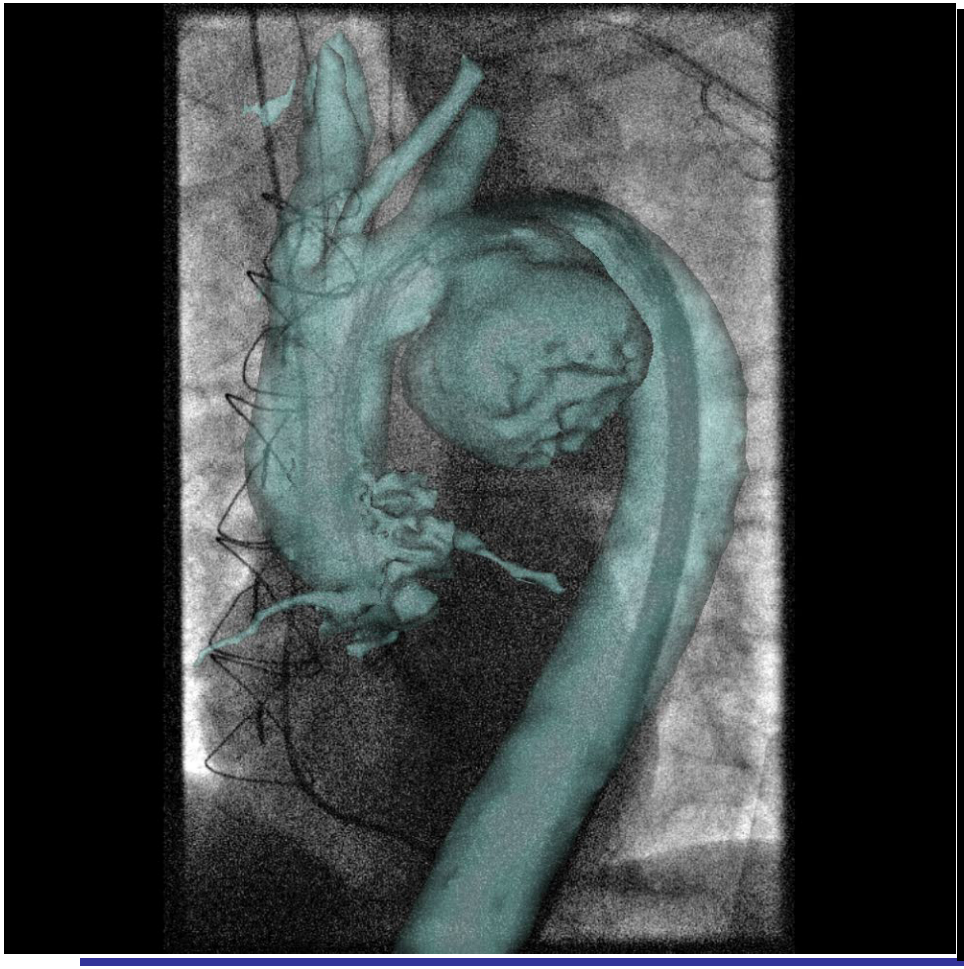


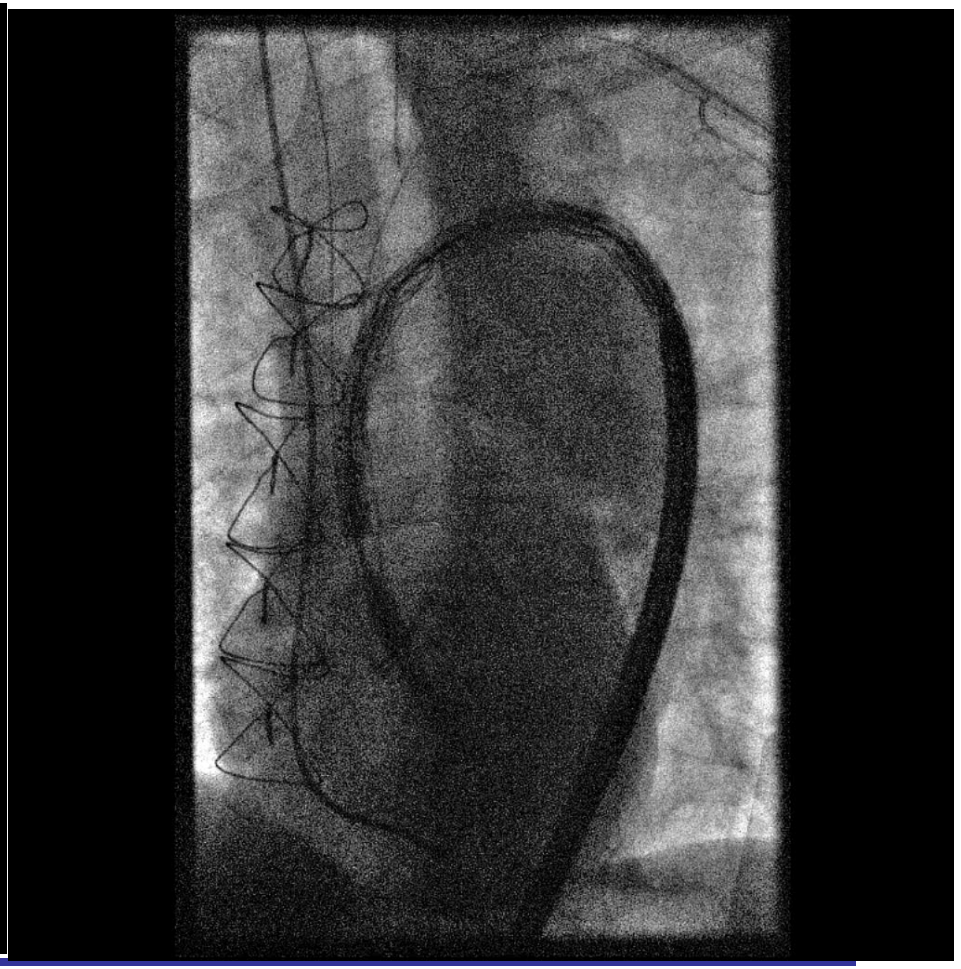





Non GE image







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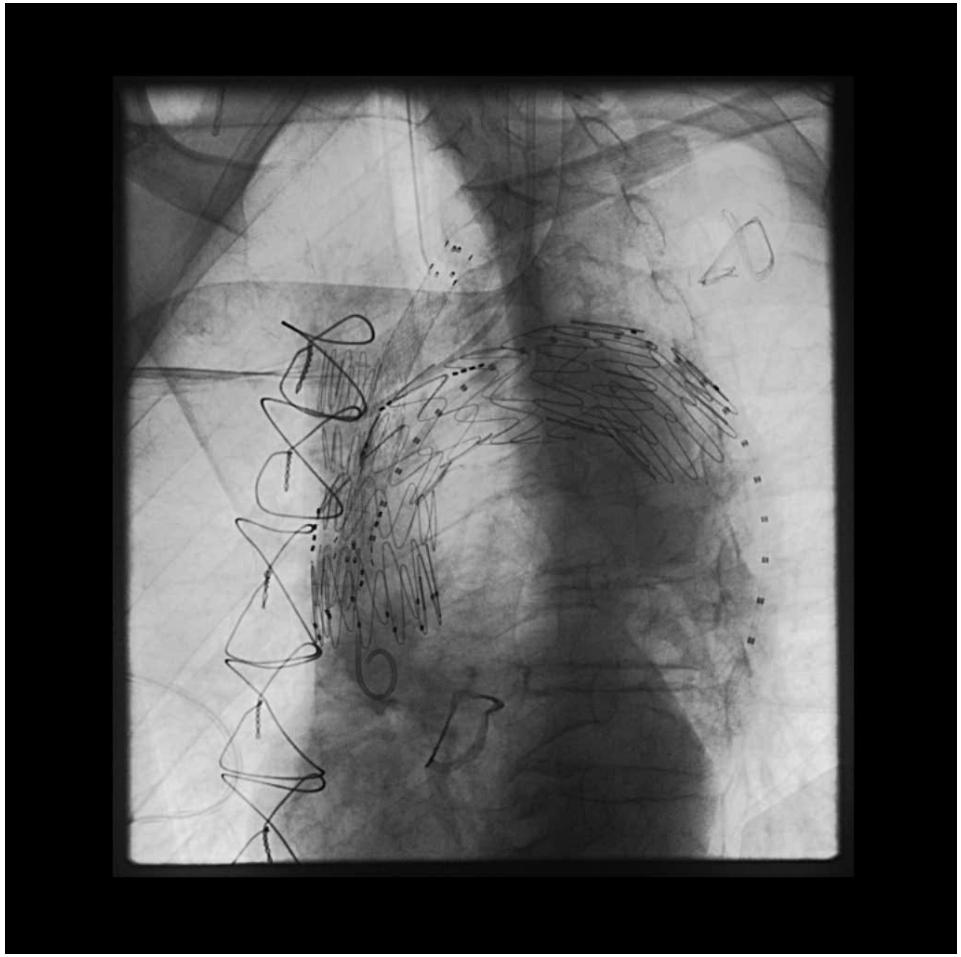
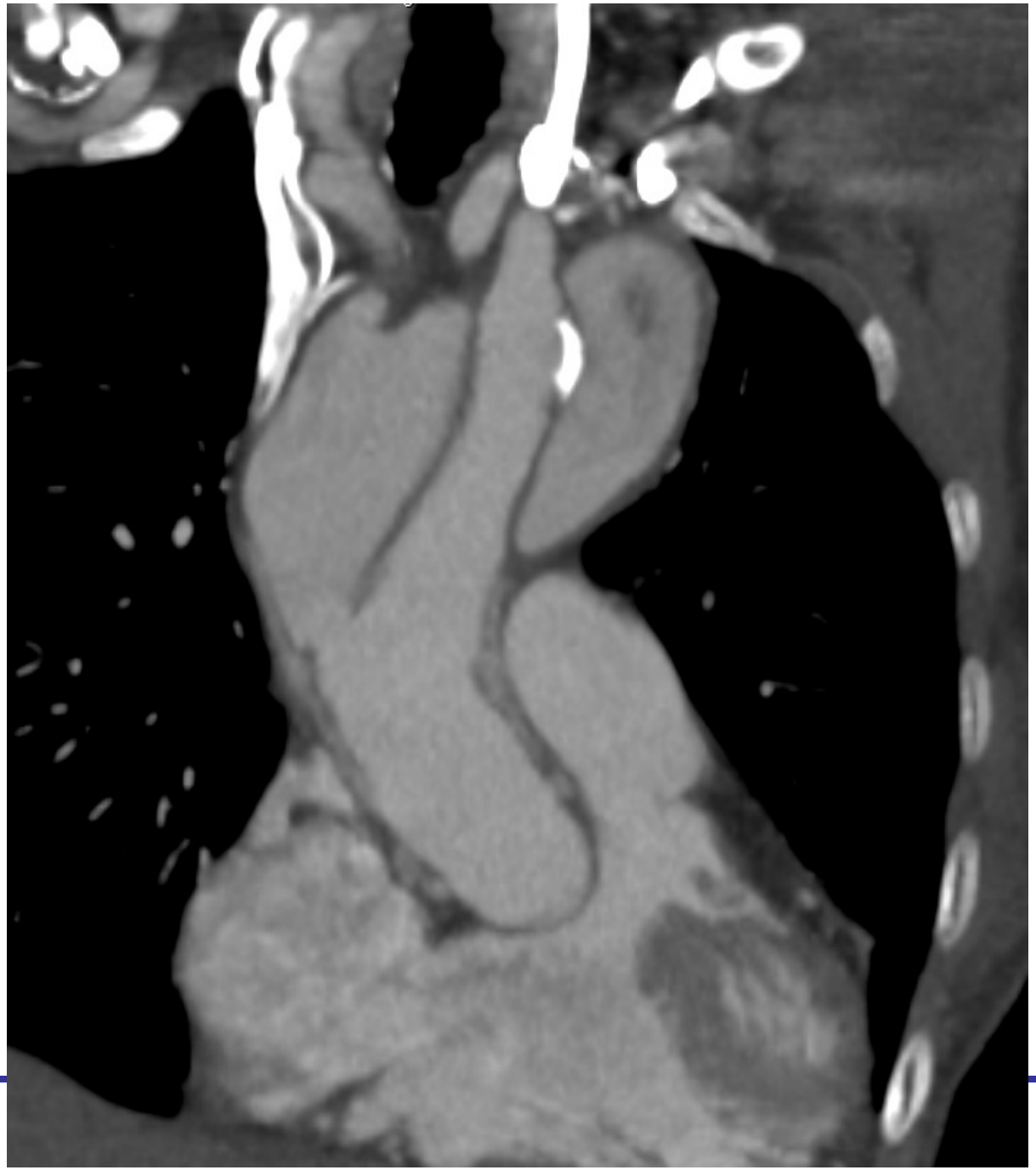
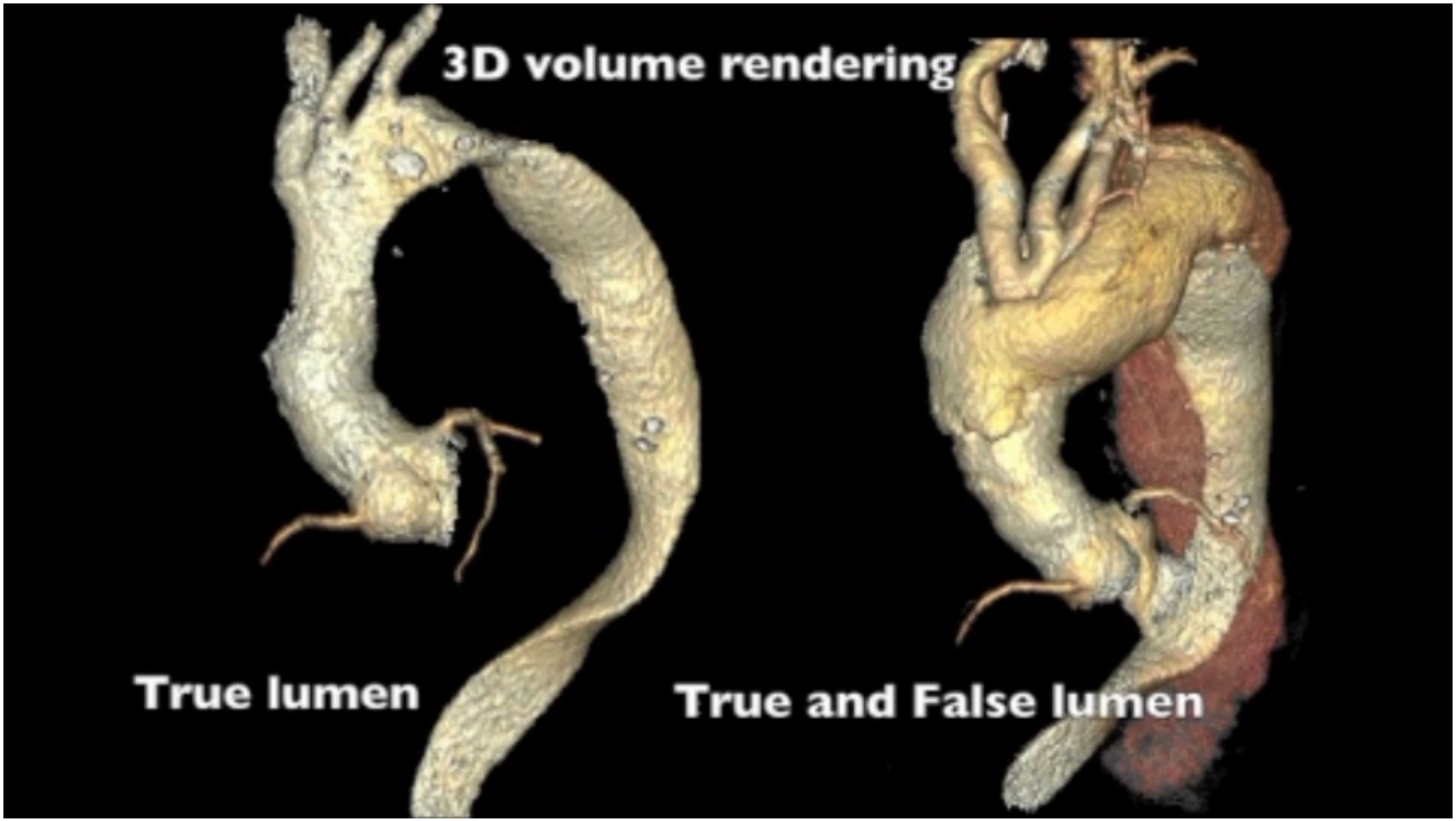
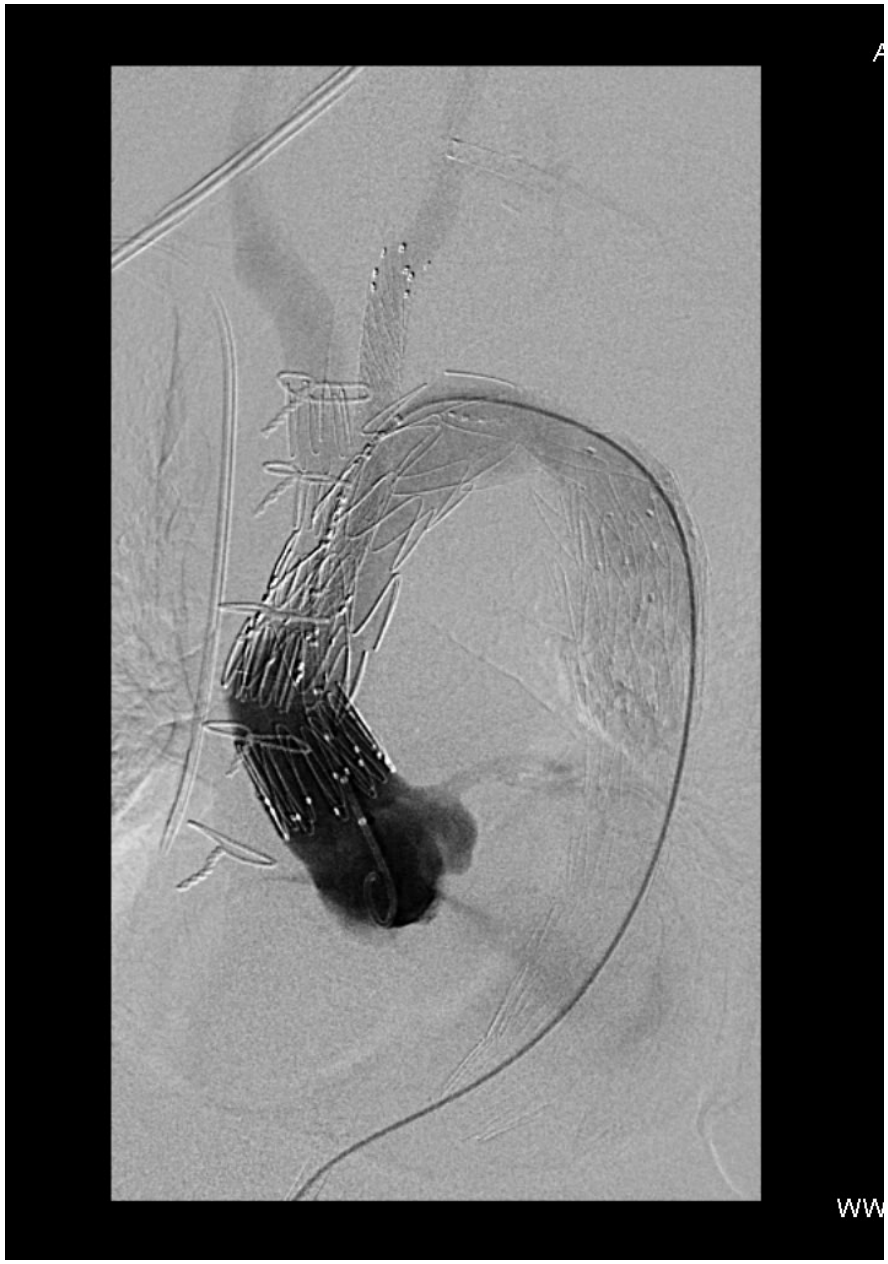


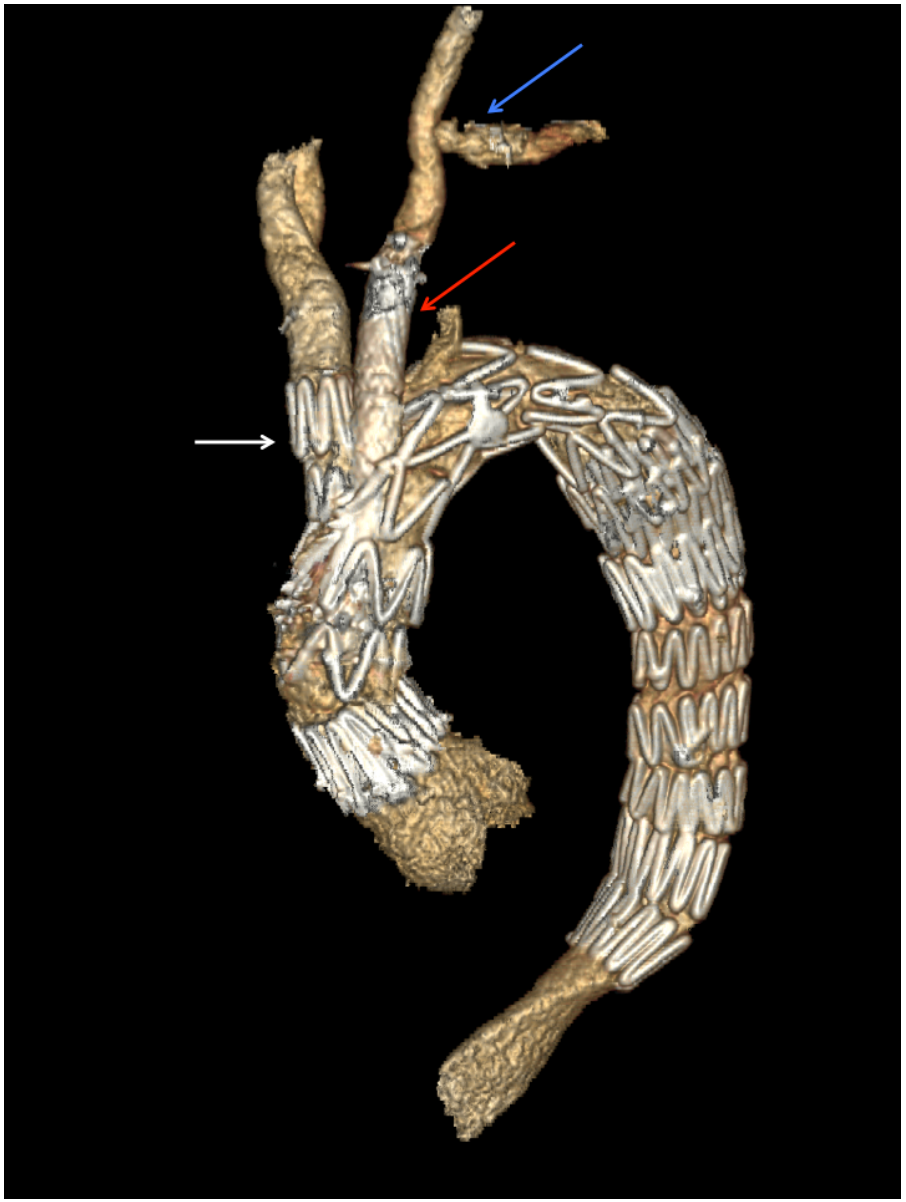
Type A Dissection Follow-Up

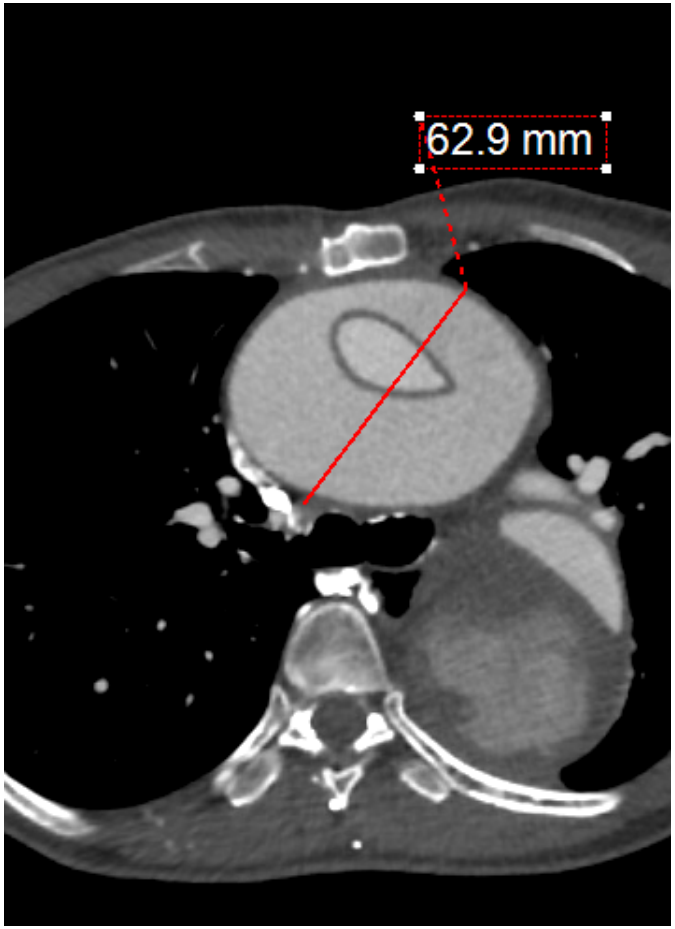
- 72 year-old female
- Previous condition
  - Acute type A dissection: Open Ascending Aorta repair in 2008
  - Essential Hypertension
  - Renal impairment
  - Severe COPD

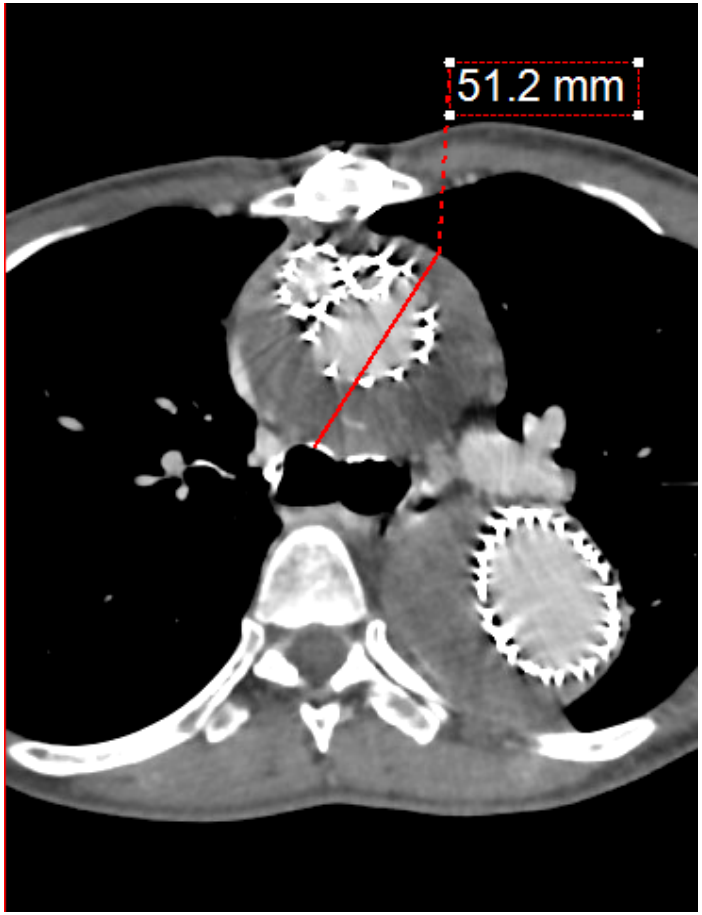



3D volume rendering
True lumen
True and False lumen



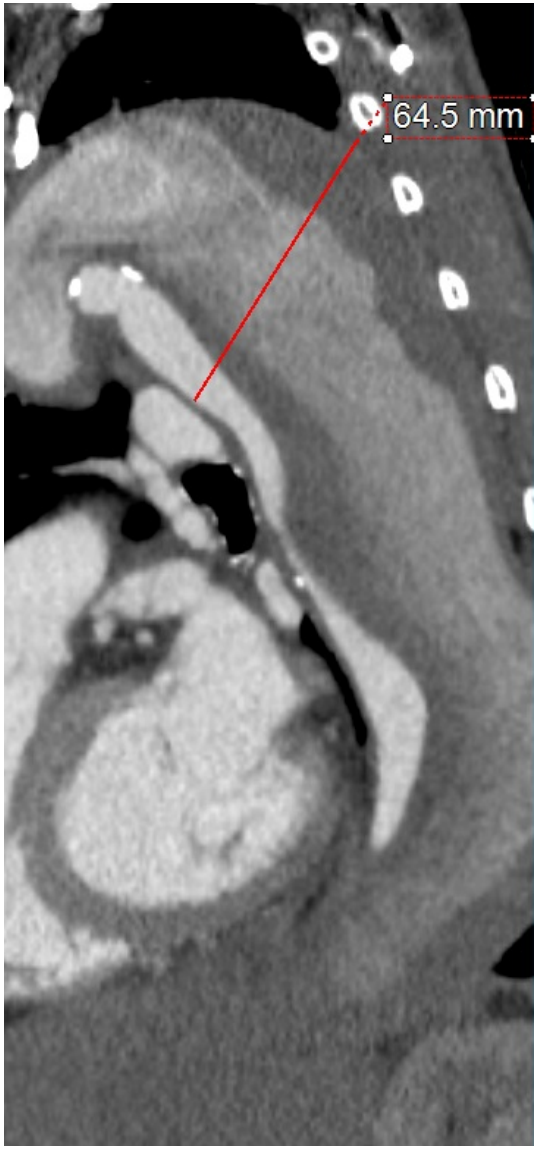




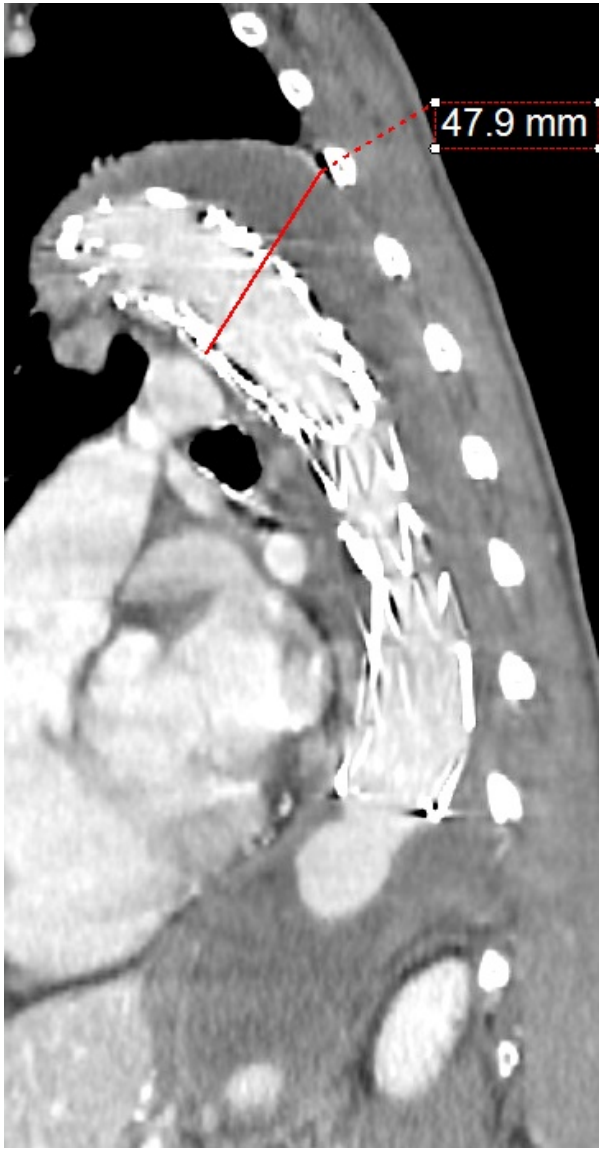


Pre-operative CT

2-year control



Pre-operative CT



2-year control

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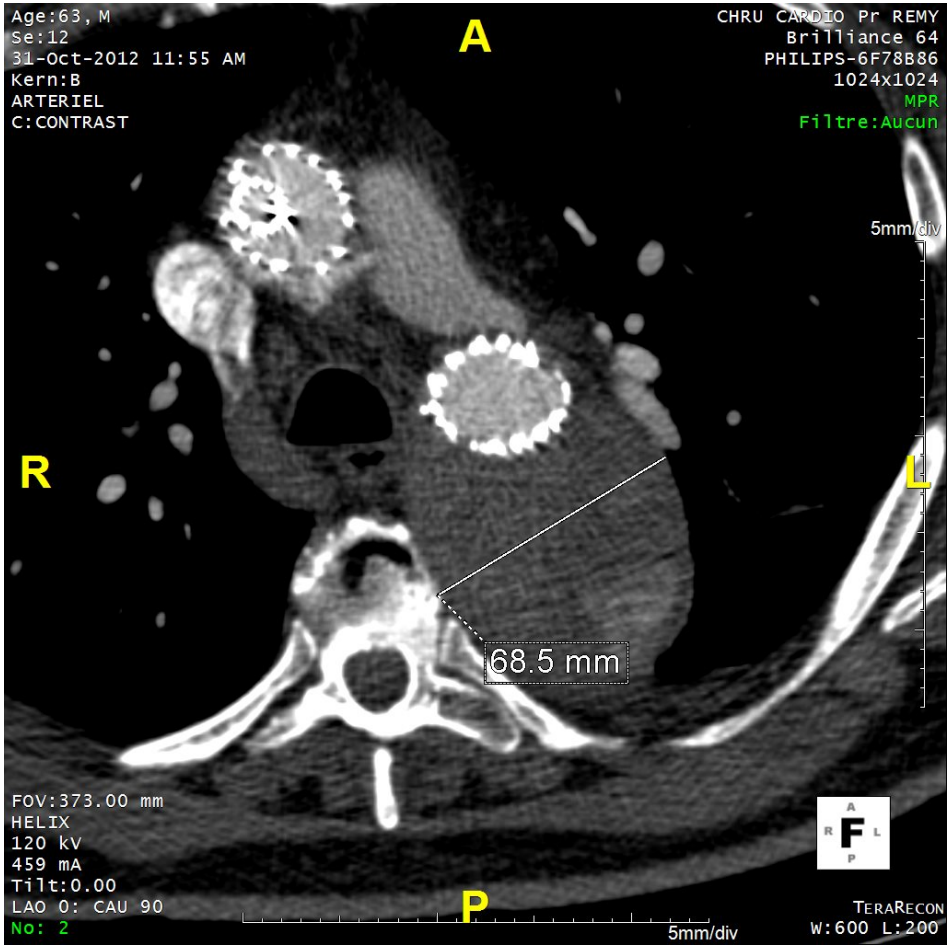
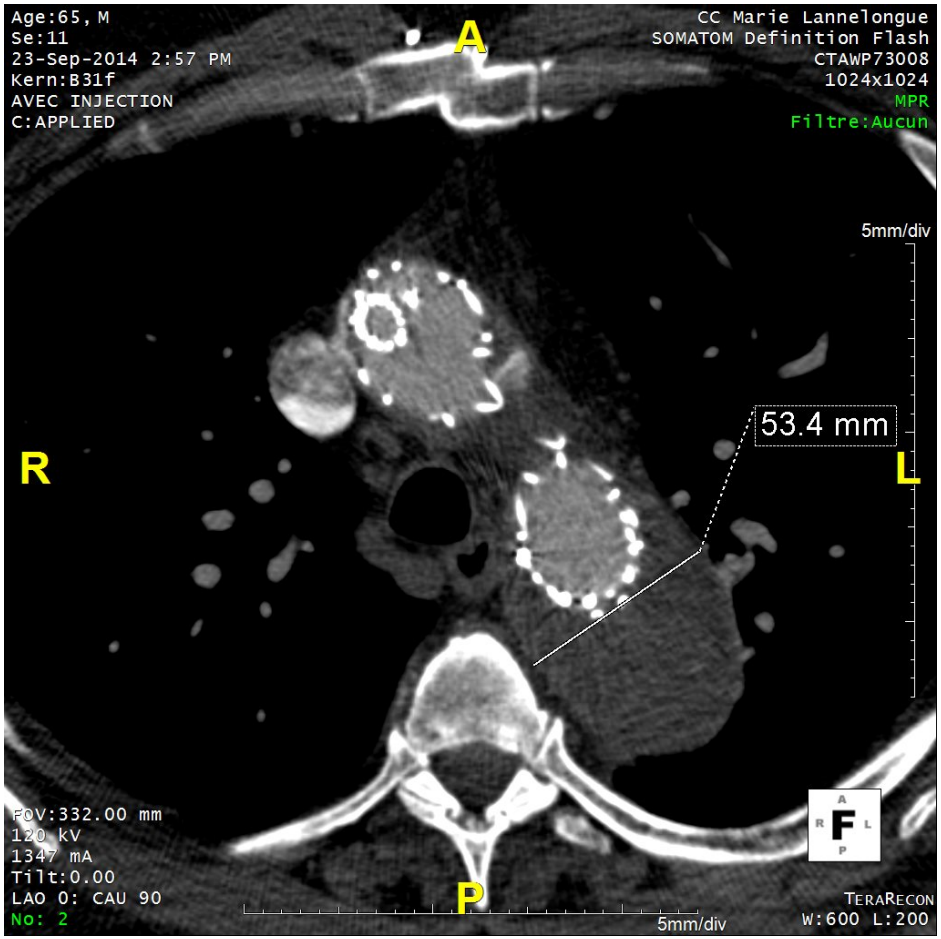


Post-operative CT



2-year control

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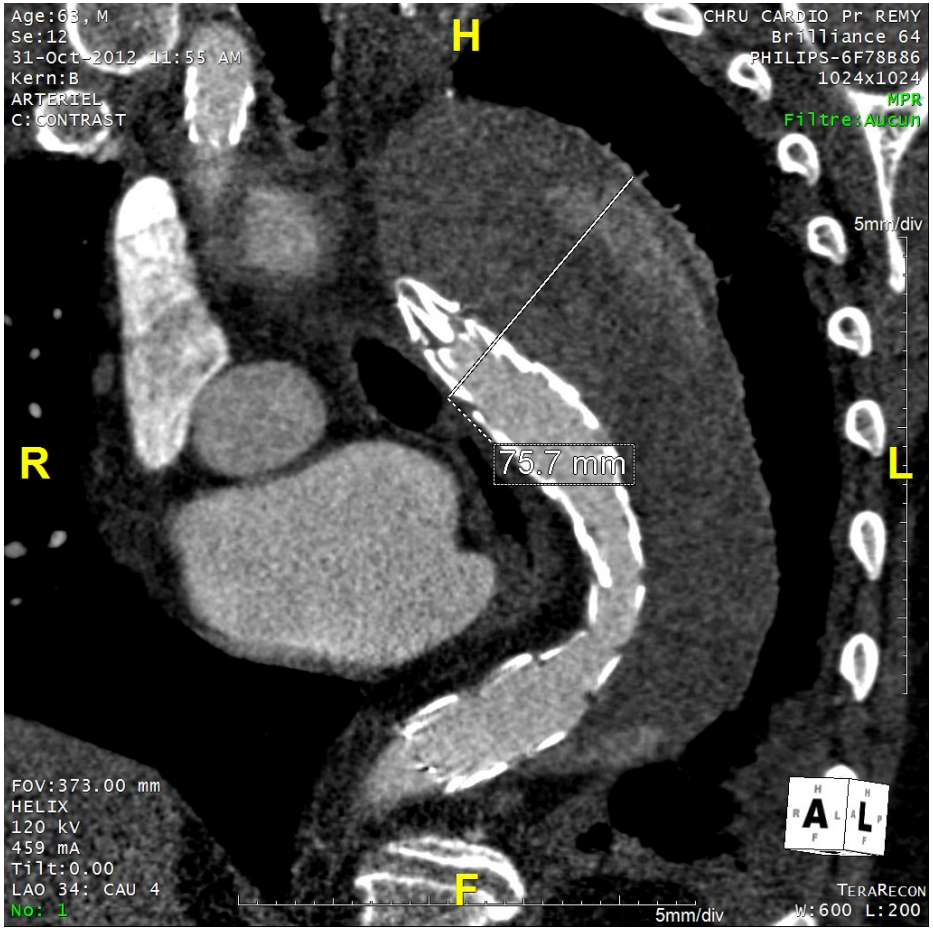
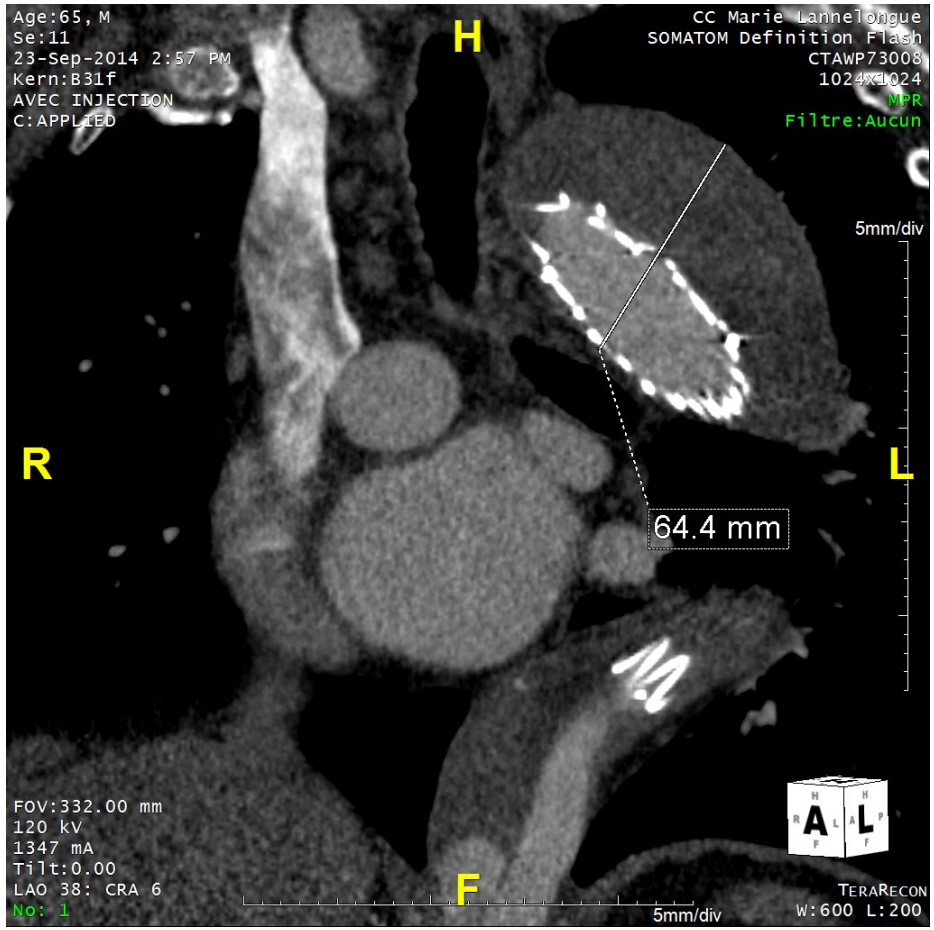


Post-operative CT



2-year control

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Global experience with an inner branched arch endograft

Stéphan Haulon, MD, PhD,[a] Roy K. Greenberg, MD,[b] Rafaëlle Spear, MD,[a] Matt Eagleton, MD,[b] Cherrie Abraham, MD,[c] Christos Lioupis, MD,[c] Eric Verhoeven, MD, PhD,[d] Krassi Ivancev, MD,[e] Tilo Kölbel, MD, PhD,[f] Brendan Stanley, MD,[g] Timothy Resch, MD,[h] Pascal Desgranges, MD, PhD,[i] Blandine Maurel, MD,[a] Blayne Roeder, PhD,[j] Timothy Chuter, MD,[k] and Tara Mastracci, MD[b]

Background: Branched endografts are a new option to treat arch aneurysm in high-risk patients.

Methods and results: We performed a retrospective multicenter analysis of all patients with arch aneurysms treated with a new branched endograft designed with 2 inner branches to perfuse the supra aortic trunks. Thirty-eight patients were included. The median age was 71 years (range, 64-74 years). An American Society of Anesthesiologists score of 3 or 4 was reported in 89.5% (95% confidence interval [CI], 79.7-99.3) of patients. The 30-day mortality rate was 13.2% (95% CI, 2.2-24.2). Technical success was obtained in 32 patients (84.2% [95% CI, 72.4-95.9]). Early secondary procedures were performed in 4 patients (10.5% [95% CI, 0.7-20.3]). Early cerebrovascular complications were diagnosed in 6 patients (15.8% [95% CI, 4.0-27.6]), including 4 transient ischemic attacks, 1 stroke, and 1 subarachnoid hemorrhage. The median follow-up was 12 months (range, 6-12 months). During follow-up, no aneurysm-related death was detected. Secondary procedures during follow-up were performed in 3 patients (9.1% [95% CI, 0.0-19.1]), including 1 conversion to open surgery. We compared the first 10 patients (early experience group) with the subsequent 28 patients. Intraoperative complications and secondary procedures were significantly higher in the early experience group. Although not statistically significant, the early mortality was higher in the early experience group (30% [95% CI, 0.0-60.0]) versus the remainder (7.1% [95% CI, 0.0-16.9]; $P = .066$). Being part of the early experience group and ascending aortic diameter $\geq$38 mm were found to be associated to higher rates of combined early mortality and neurologic complications.

Conclusions: Our preliminary study confirms the feasibility and safety of the endovascular repair of arch aneurysms in selected patients who may not have other conventional options. Clinical trial registration information: Thoracic IDE NCT00583817, FDA IDE# 000101. (J Thorac Cardiovasc Surg 2014;■:1-8)

Risk Factors for Early Mortality and Neurologic Events

	EE (n = 10) versus LE (n = 28)	AAD ≥38 mm (n = 11) versus AAD <38 mm (n = 27)	PAAS (n = 12) versus no PAAS (n = 26)
Early mortality and neurologic events (n = 11)	6 (60.0; 28.1-91.9) vs 5 (17.9; 3.4-32.4)	6 (54.5; 13.7-85.3) vs 5 (18.5; 3.6-33.4)	2 (16.7; 5.5-38.7) vs 9 (34.6; 16-53.2)
P value	**.019**	**.026**	.23

Values are given as n (%; 95% confidence interval). Boldface indicates *P* values < .05. *EE*, Early experience (first 10 patients); *LE*, late experience (later 28 patients); *AAD*, ascending aorta diameter; *PAAS*, prior ascending aortic surgery.

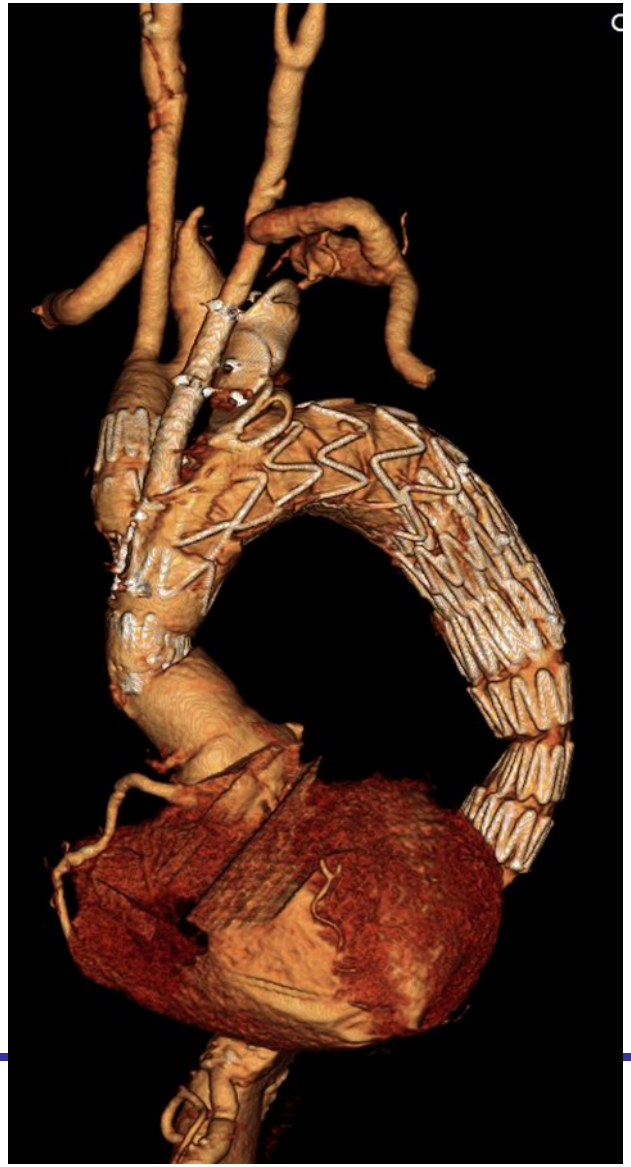
Update
Abstract submitted to SVS

- Aortic Centre, CHRU Lille, France
- Vascular Surgery, Jikei University, Tokyo, Japan
- Klinik und Poliklinik für Gefäßmedizin, Universitäres Herzzentrum Hamburg, Hamburg, Germany

SVS Abstract

- 27 patients
- Technical success always achieved
- No patients died during the 30-day postoperative period
- Early neurologic events:
  - 2 major and one minor strokes (11%)
  - Transient spinal cord ischemia with full recovery was observed in 2 patients (7%).

Post Type A Repair



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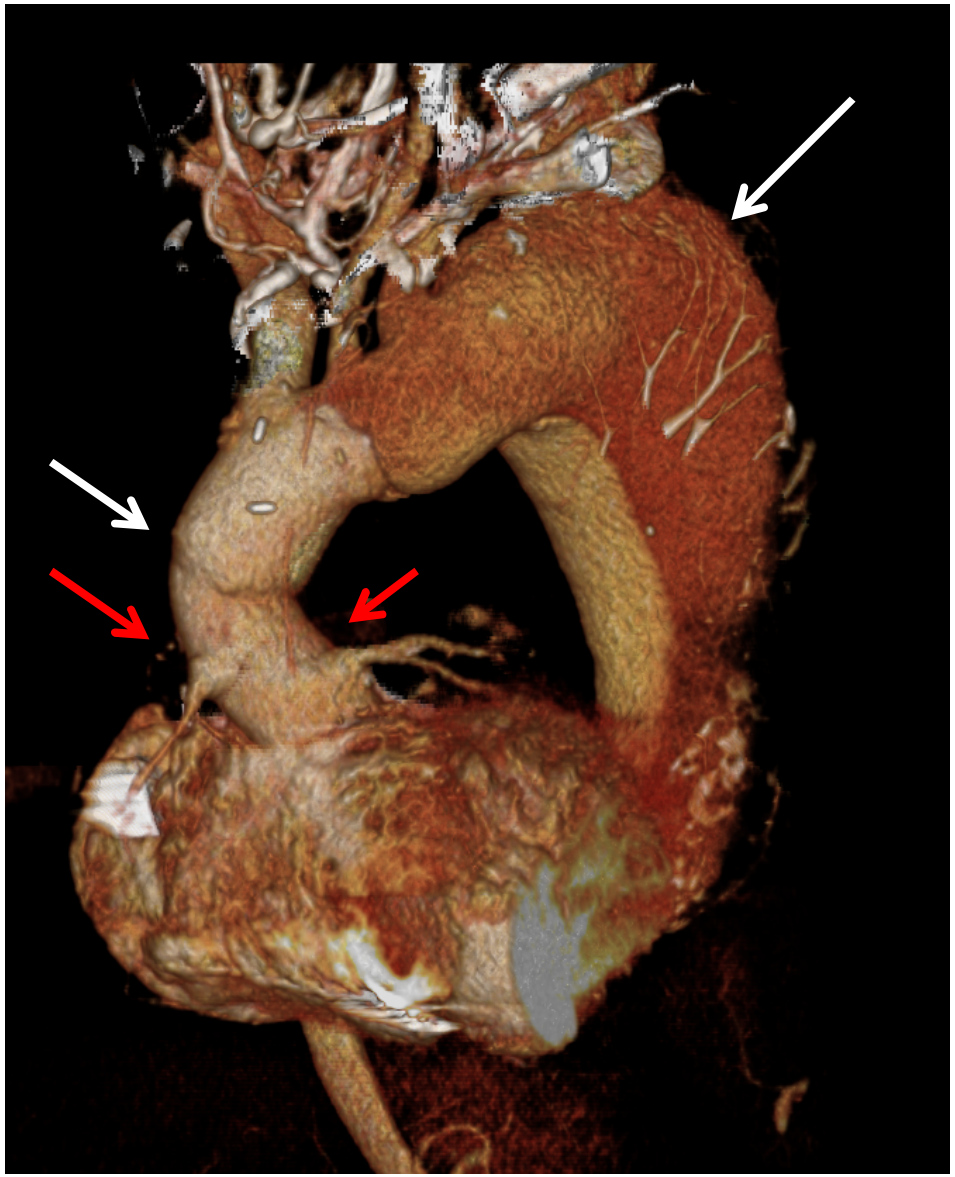

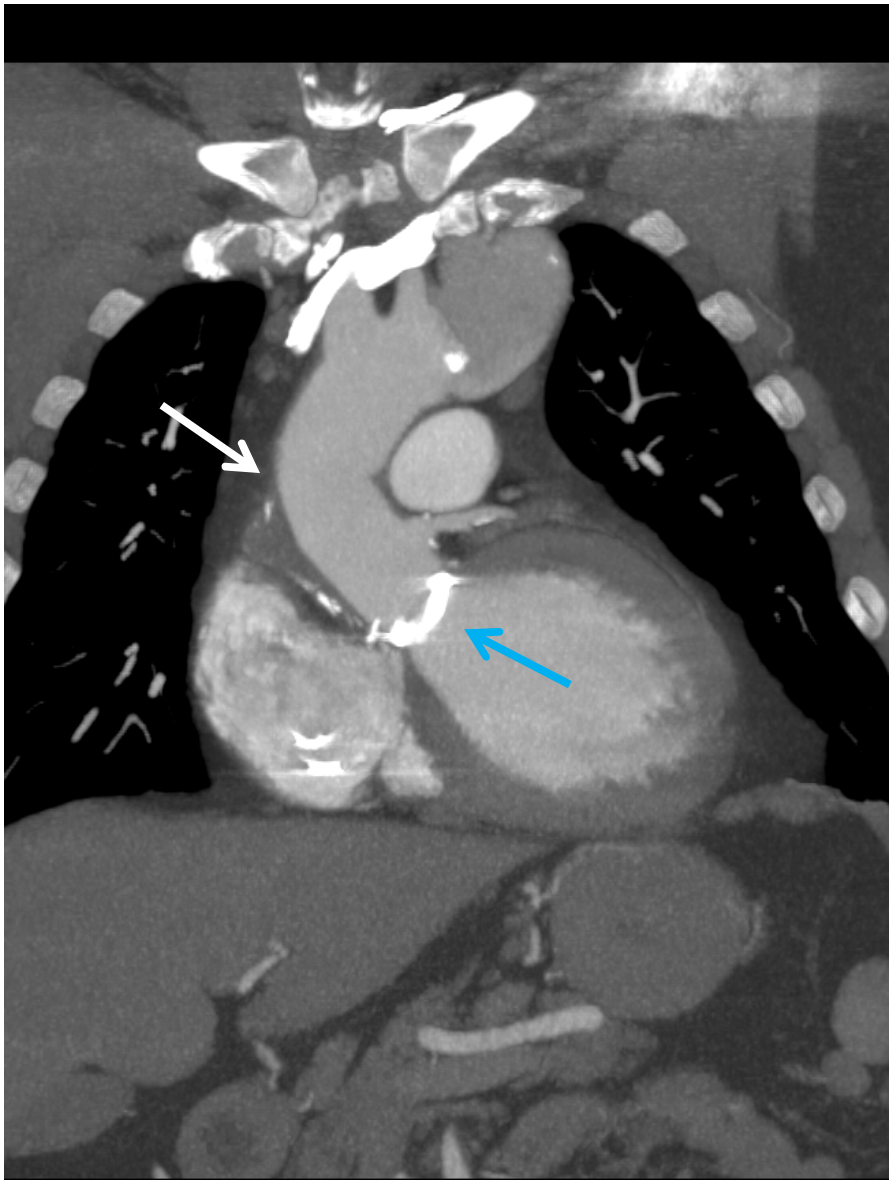

ANATOMIC RESTRICTIONS

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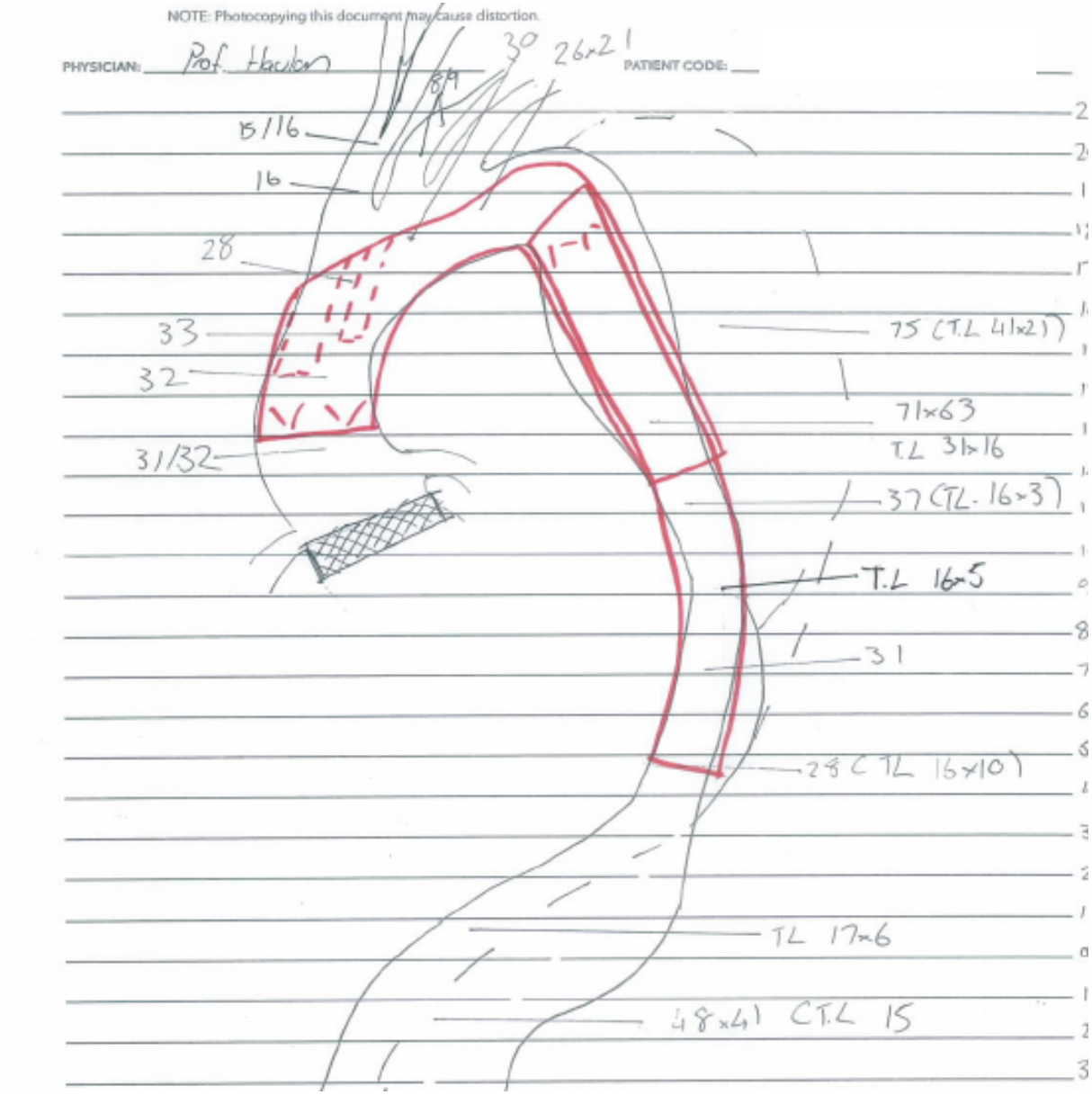
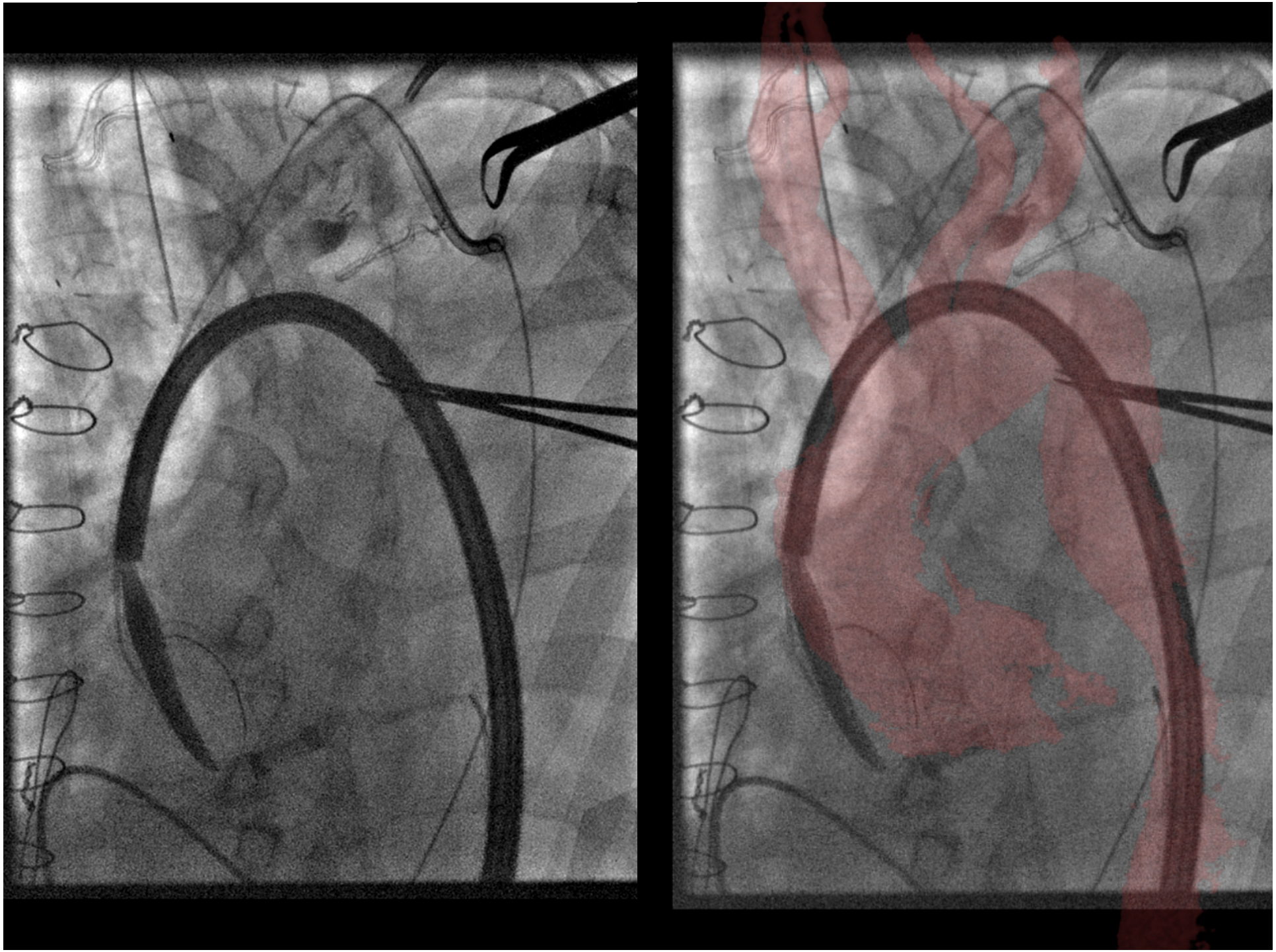
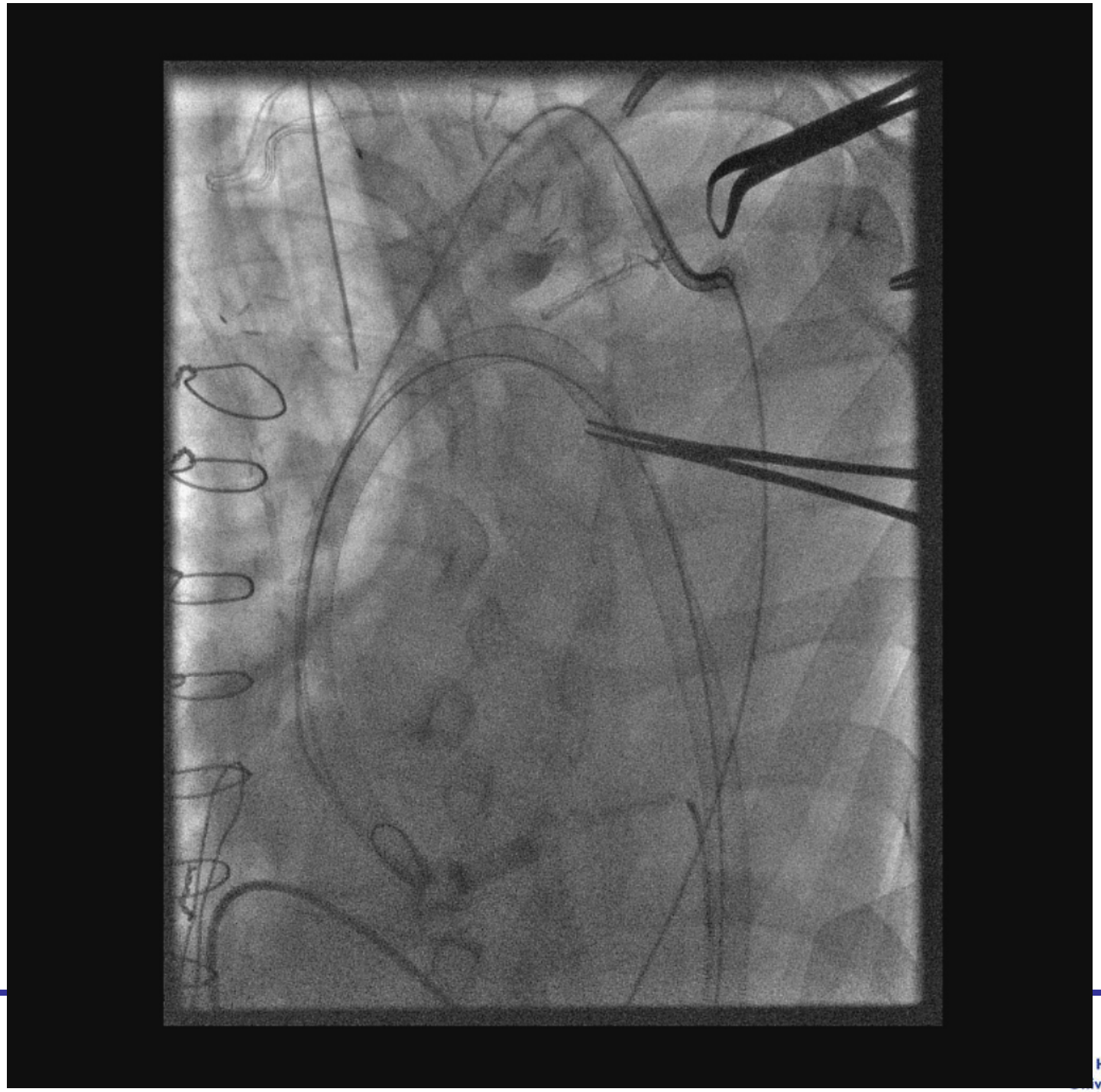

NOTE: Photocopying this document may cause distortion.
PHYSICIAN: Prof. Hacidon
30
26x21
PATIENT CODE:
89
15/16
16
28
33
32
31/32
75 (T.L 41x21)
71x63
T.L 31x16
37 (T.L. 16x3)
T.L 16x5
31
28 (T.L 16x10)
T.L 17x6
48x41 C.T.L 15





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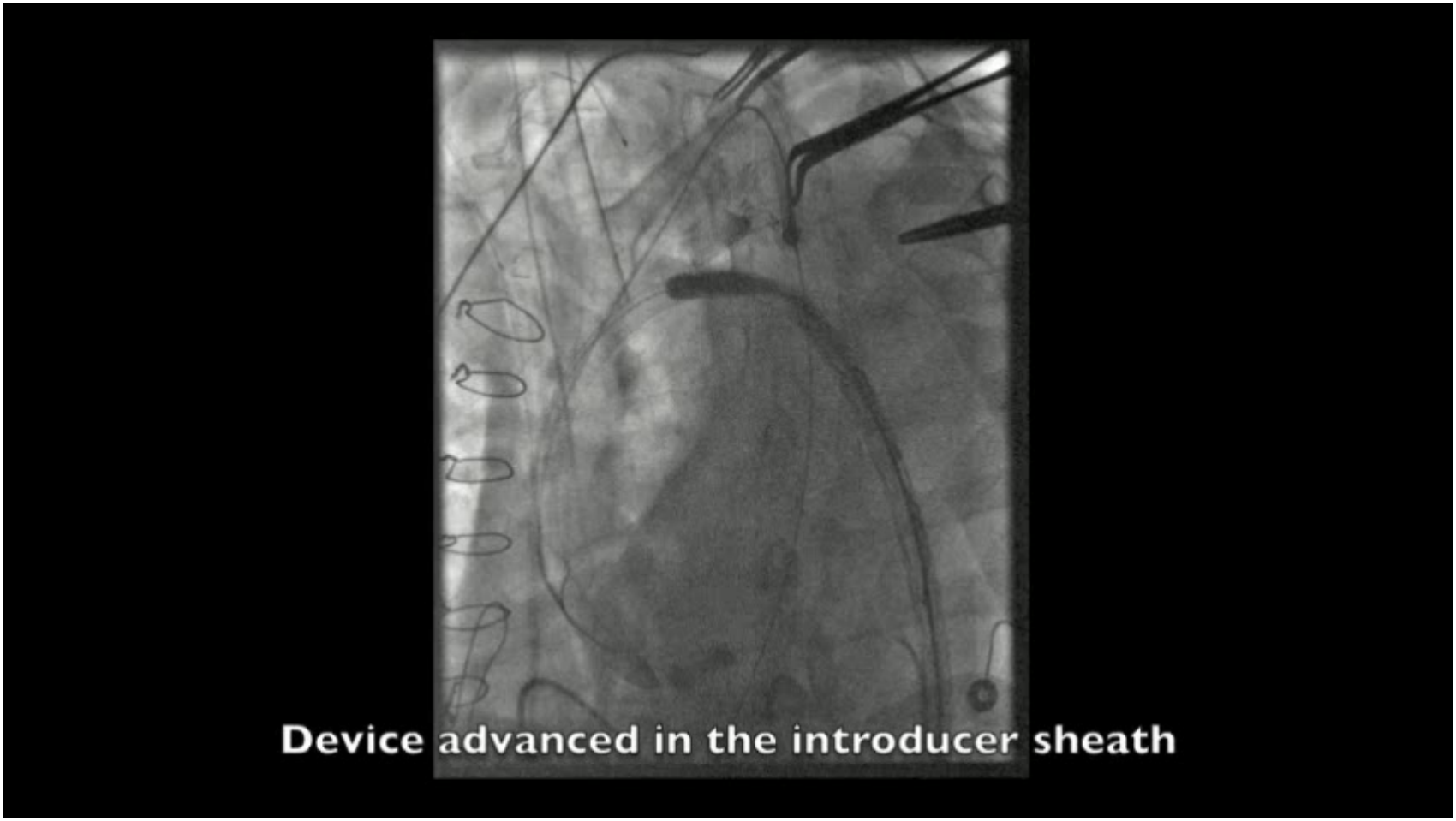
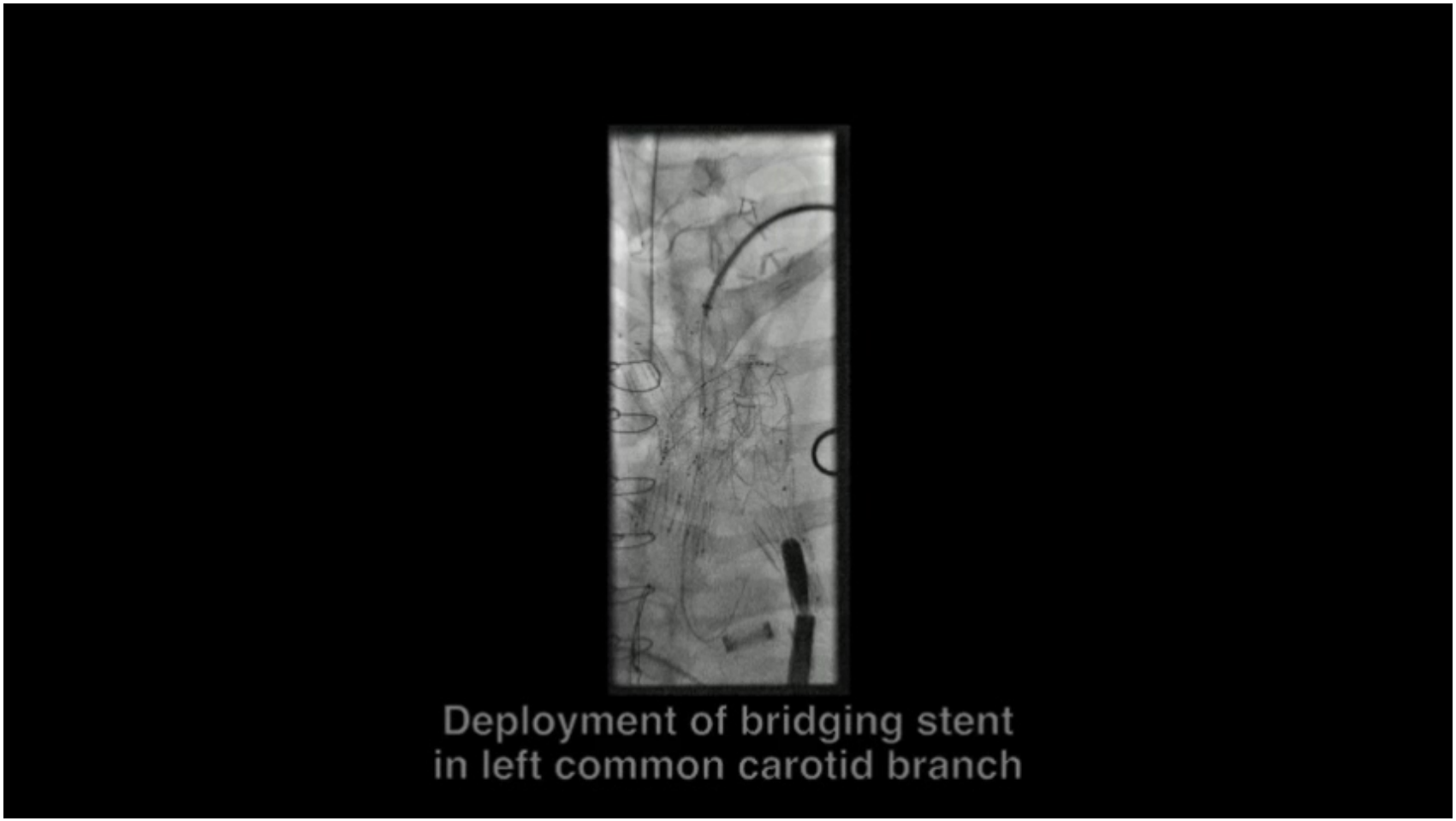

Device advanced in the introducer sheath


Deployment of bridging stent
in left common carotid branch

CONCLUSION

- ✓ Conventional surgery: «gold standard» but not in « high risk patients »
- ✓ Hybrid technique: Seal in Ascending Aorta?
- ✓ Total endovascular repair:
  - ✓ Seal in Ascending Aorta?
  - ✓ Type A dissection Follow-up
  - ✓ Patients unfit for redo sternotomy