TREATMENT OPTIONS FOR POST DISSECTION AORTIC ANEURYSMS

Stéphan Haulon,
J Sobocinski, T Martin-Gonzalez, R Clough,
R Spear, A Hertault, R Azzaoui

Aortic Center,
Lille University Hospital, France

Centre Hospitalier Régional
Universitaire de Lille

Disclosures

- Research support, Consulting, IP
  - Cook Medical, GE Healthcare

Chronic Dissections Definition

Medicine (Baltimore)1963

14 DAYS
< Acute, > Chronic

DISSECTING ANEURYSM OF THE AORTA:
A REVIEW OF 505 CASES

ALBERT E. HIRST, JR., M.D., VARNER J. JOHNS, JR., M.D., and S. WESLEY KIME, JR., M.D.

Subacute: 14 days to 3 months

Steuer J, *EJEVS* 2013

Hyperacute **0 to 48h**
Acute **2 to 7days**
Subacute **7 to 30days**
Chronic **>30 days**

Booher AM, *Am J Med* 2013

POST DISSECTION AORTIC ANEURYSMS = False Lumen Aneurysmal Evolution?

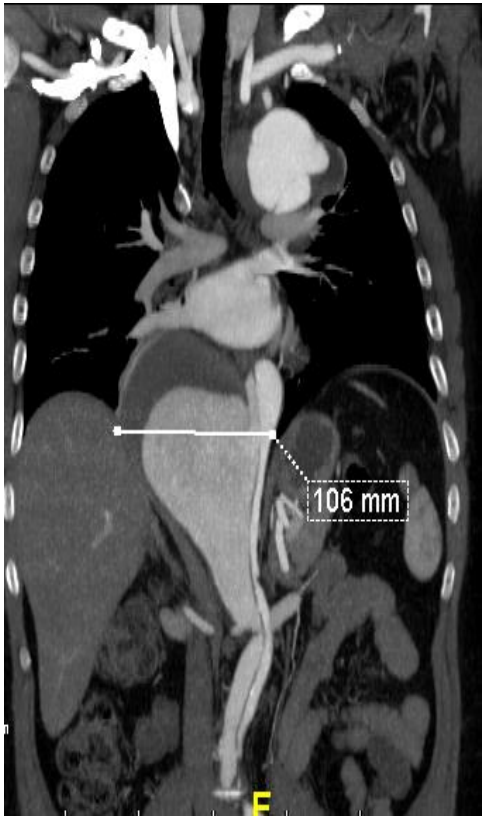
- Up to **49%** during FU after open surgery for type A AD
- Up to **73%** at 5 years after the acute onset of type B AD

[Tsai, TT et al. Circ 2006]

[Zierer, A et al. Ann Thorac Surg 2007]

[Fattori, R et al. JACC Cardiovasc Interv 2013]

[Jonker, FH et al. Ann Thorac Surg 2012]

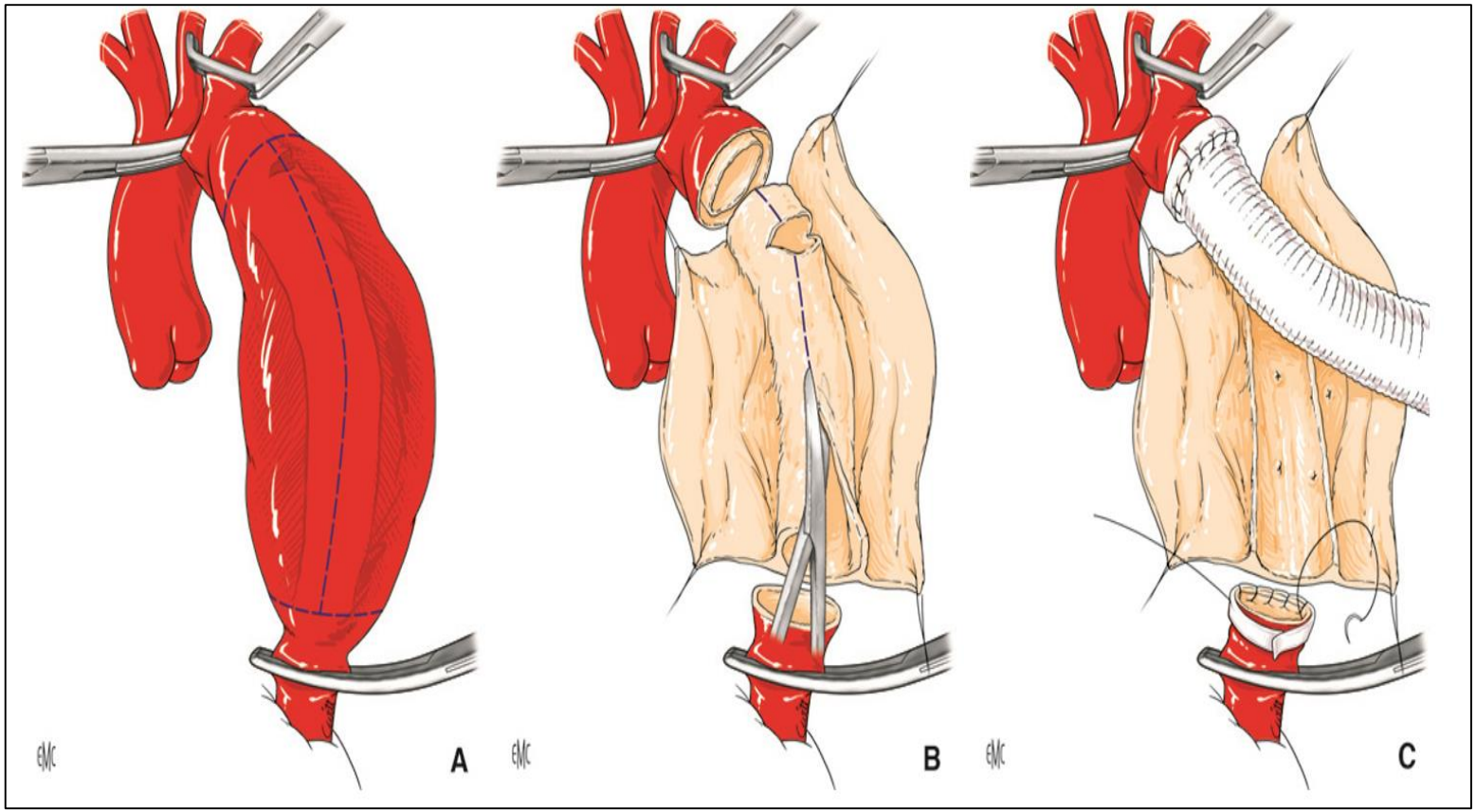


POST DISSECTION AORTIC ANEURYSMS Indication for Surgery?

- **Max Diameter >5.5-6cm** [Elefteriades. ATS 2002]
  or even larger when extensive repair is required

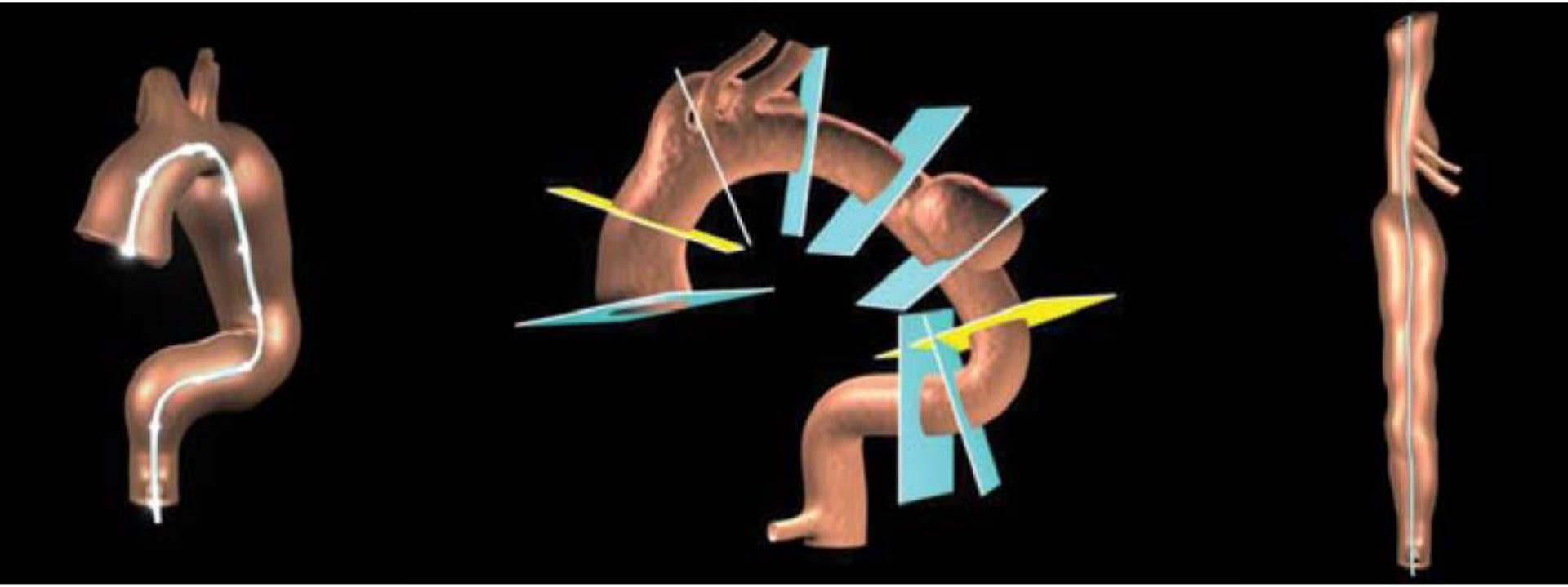
- **In most series, mean aortic diameter at the time of procedure was from 5.7 to 6.1cm** [Pujara JTCS 2012; Conway JVS 2014]

Surgical Options
OPEN



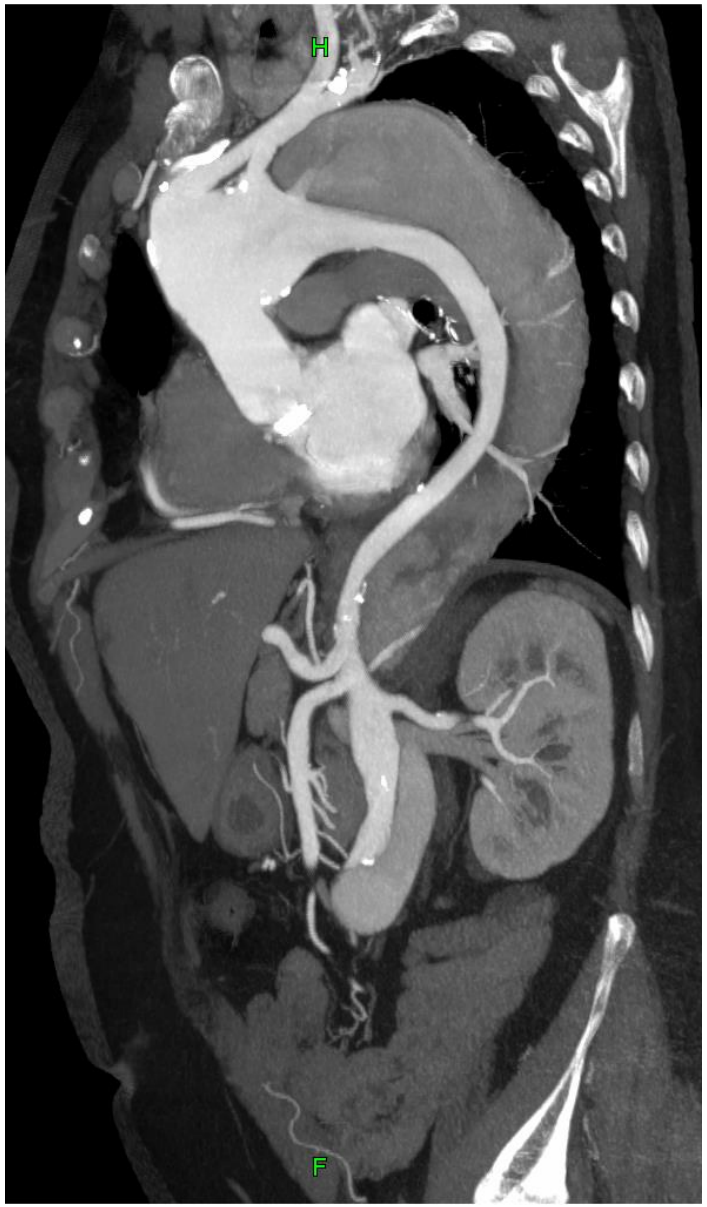
EMC

Surgical Options
TEVAR

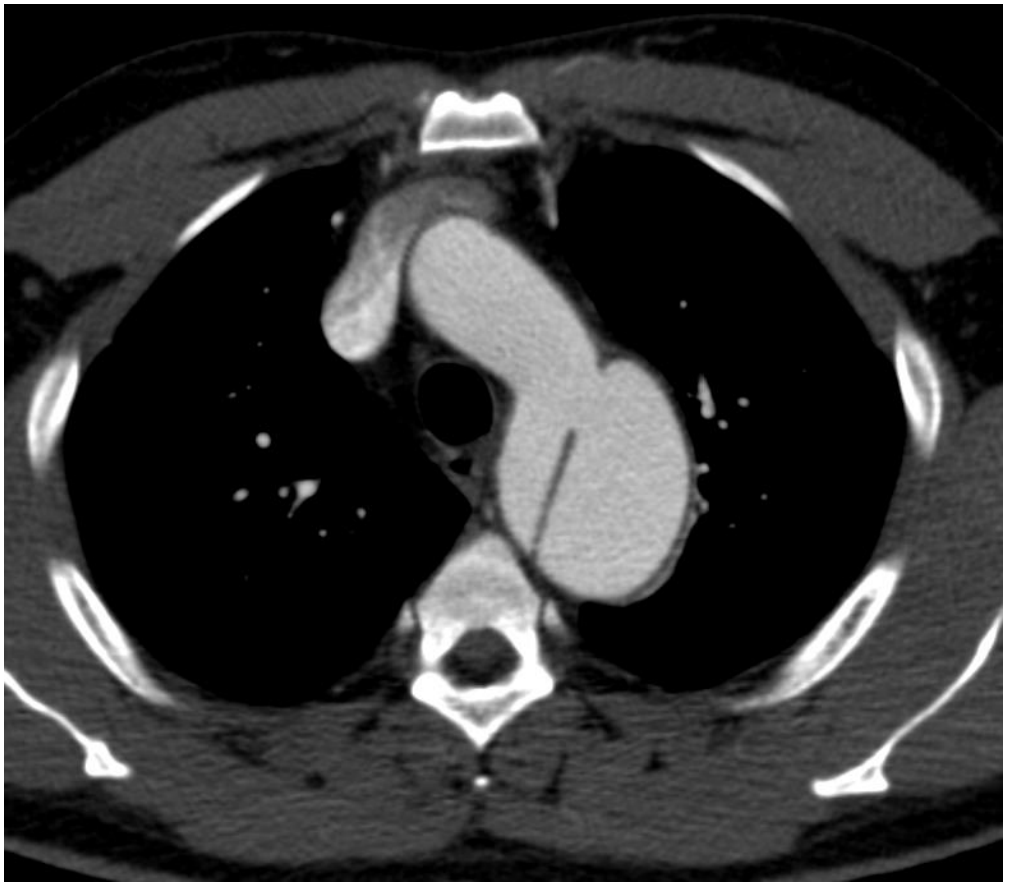


Chronic Dissections

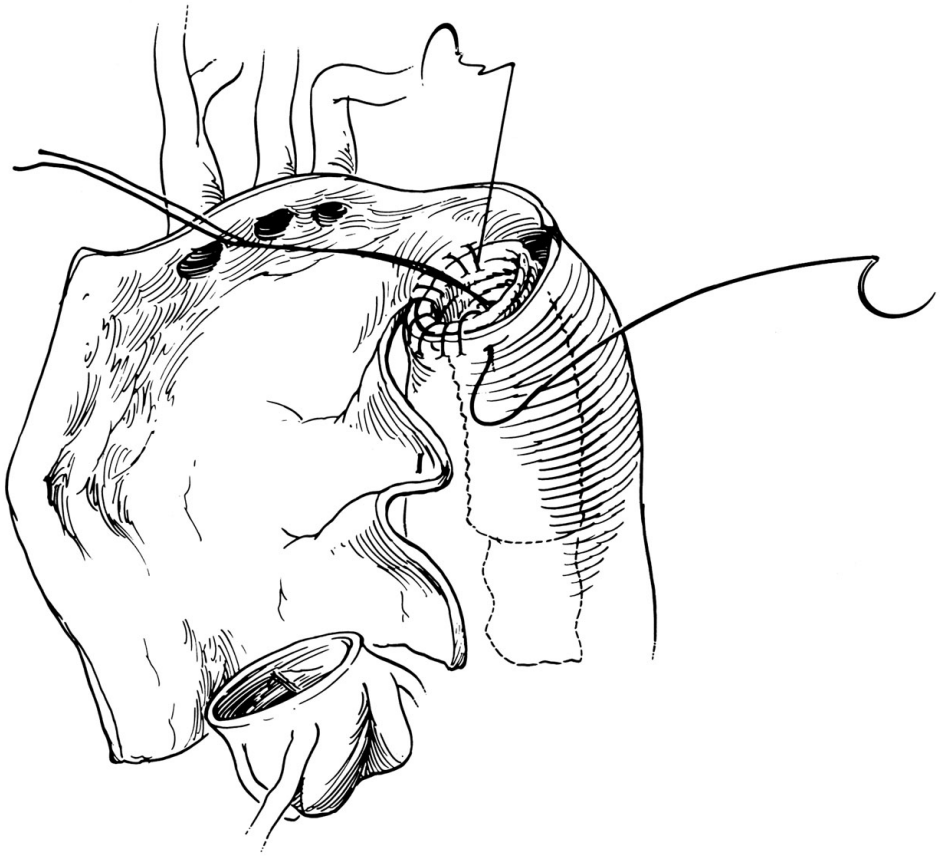
- Proximal and Distal Sealing
- Narrow true lumen
- Target vessels perfused by false lumen

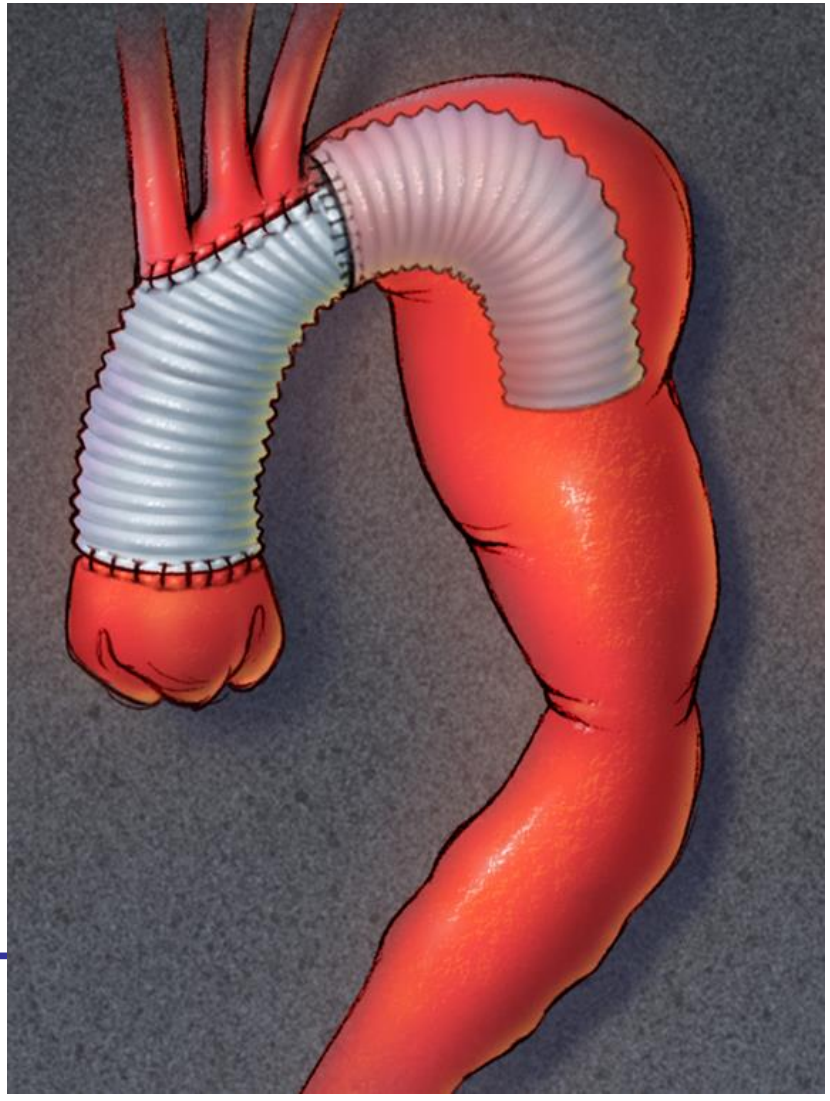


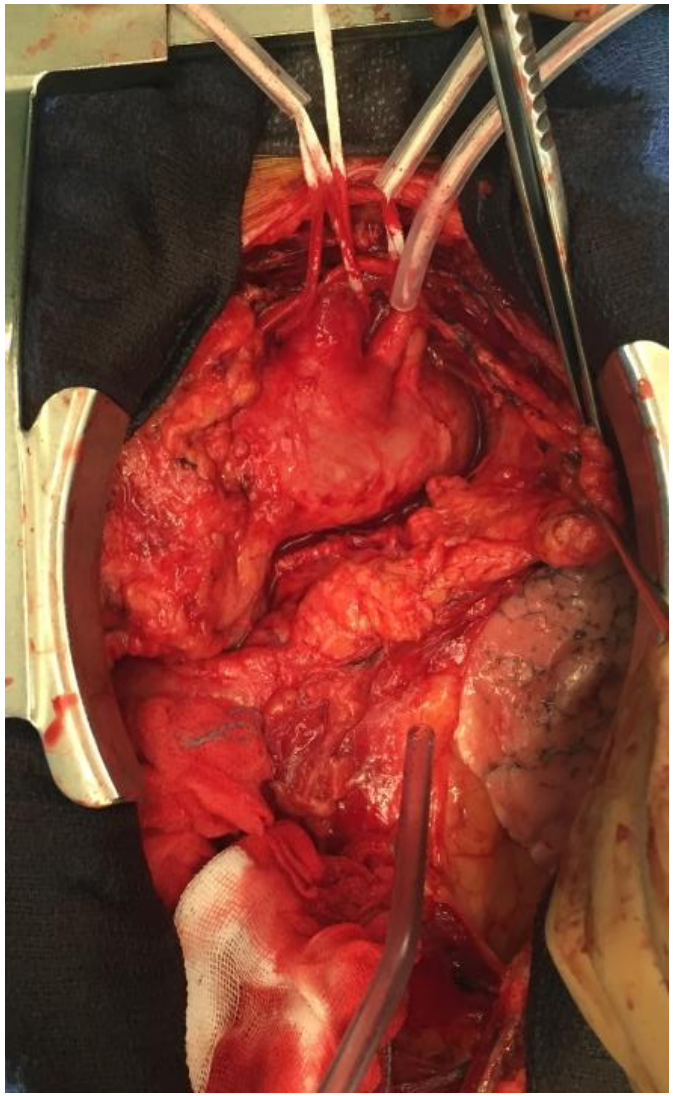

5mm/div

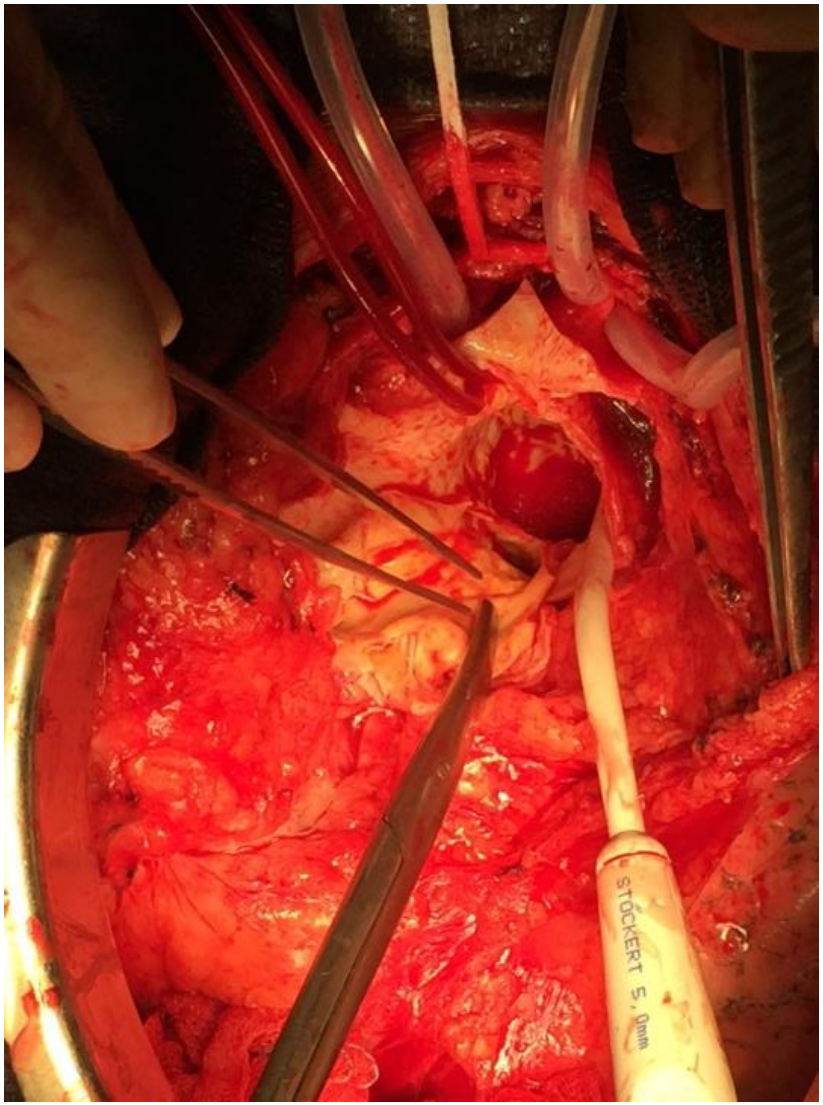


No Compromise on Proximal Seal - Open Surgery

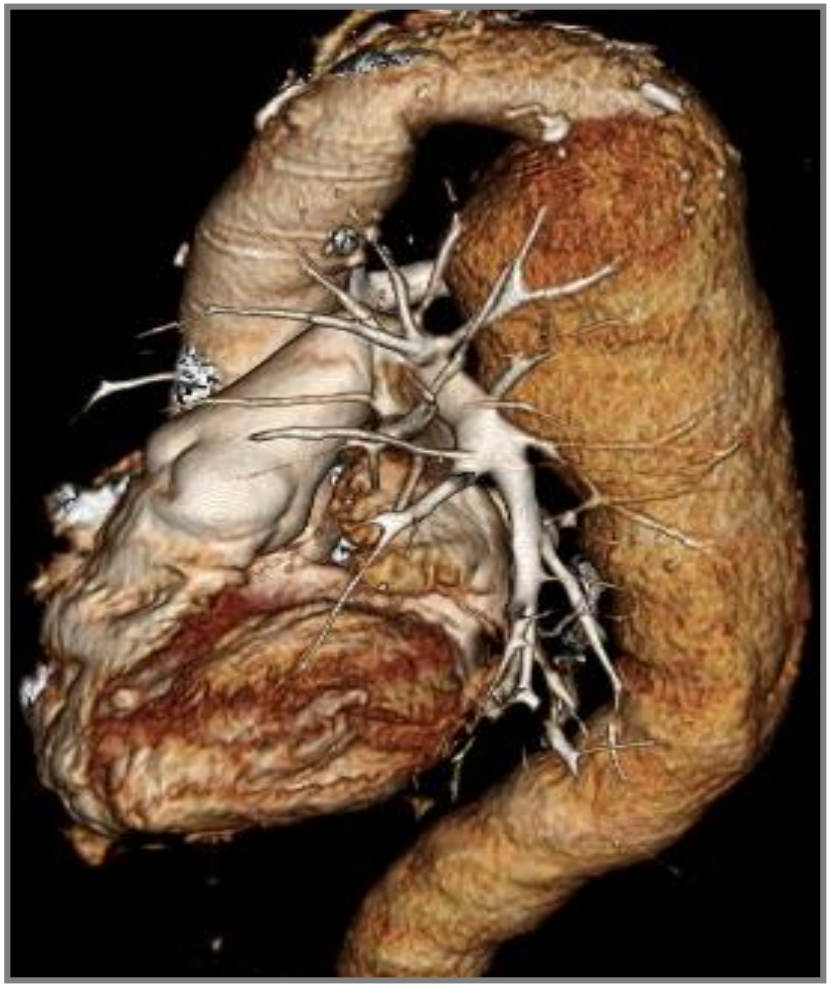


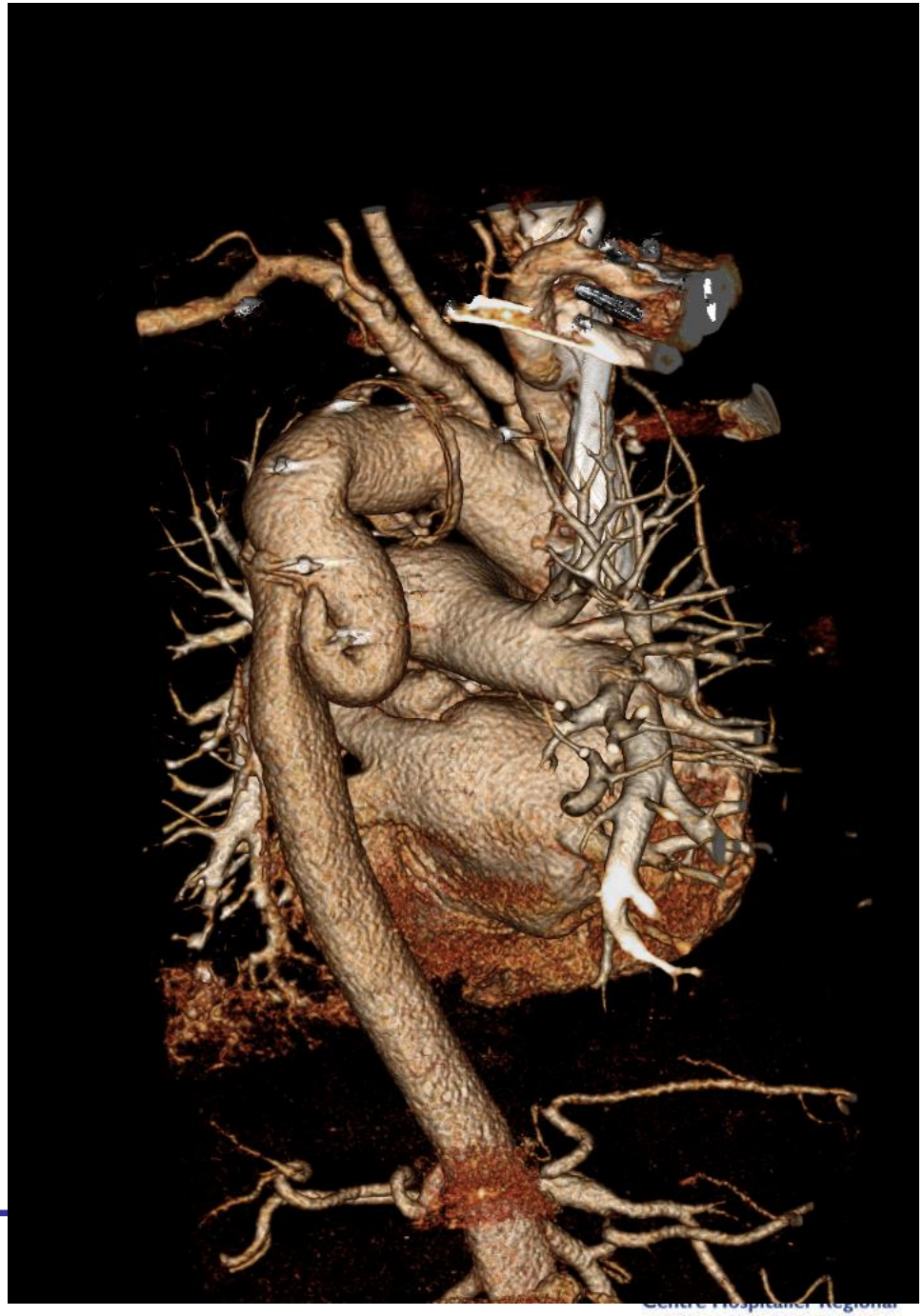


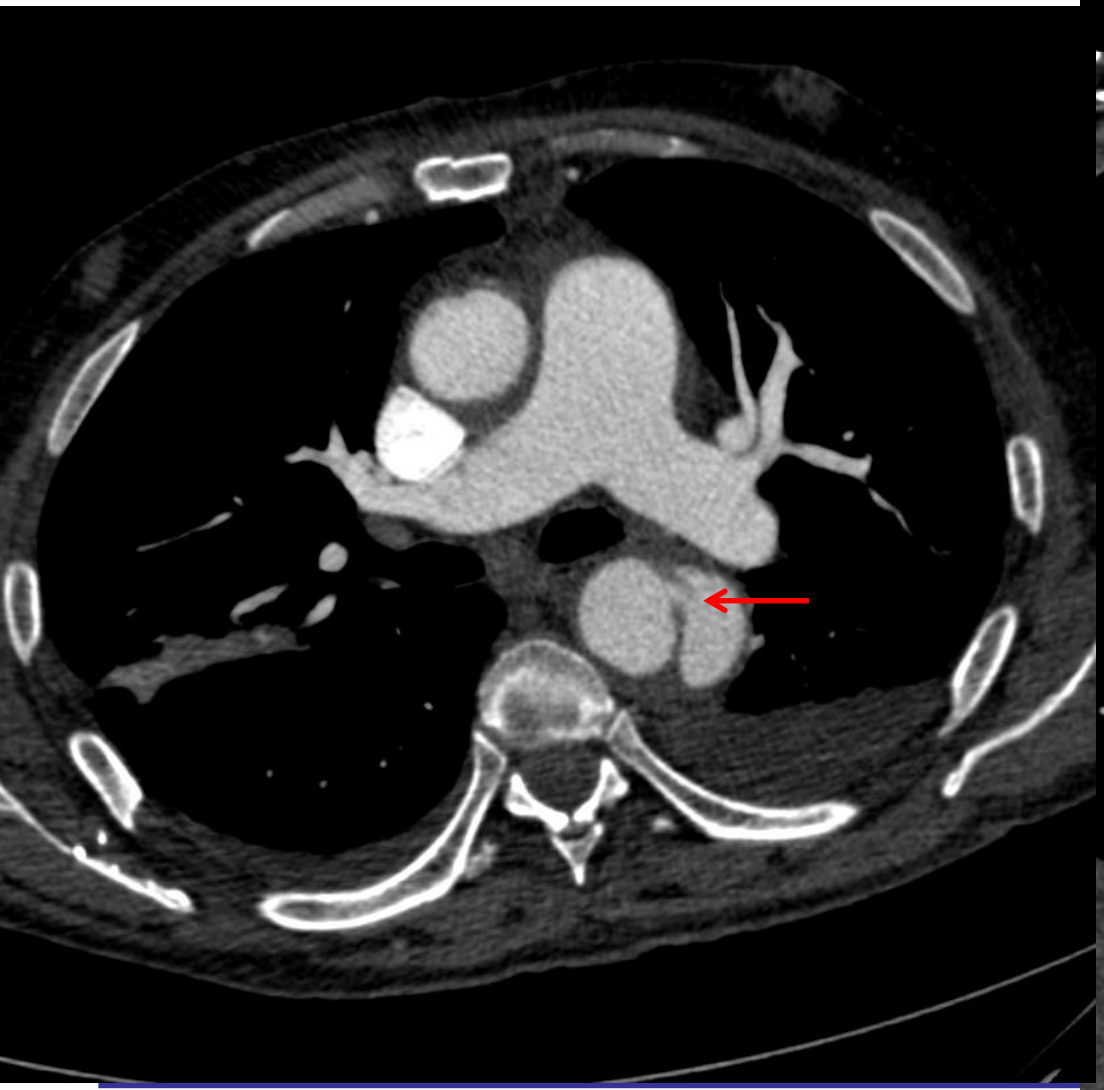


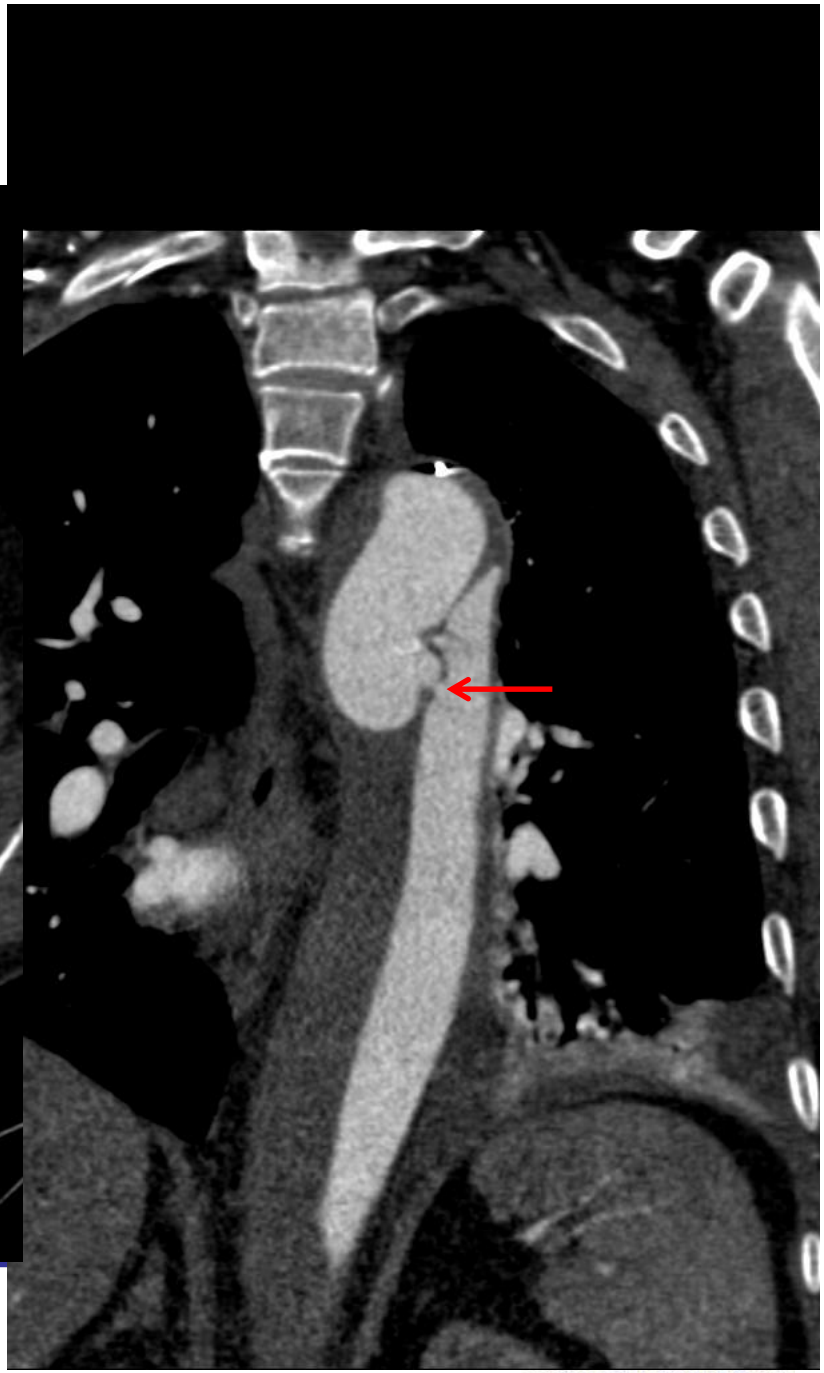

STÖCKERT 5,0mm

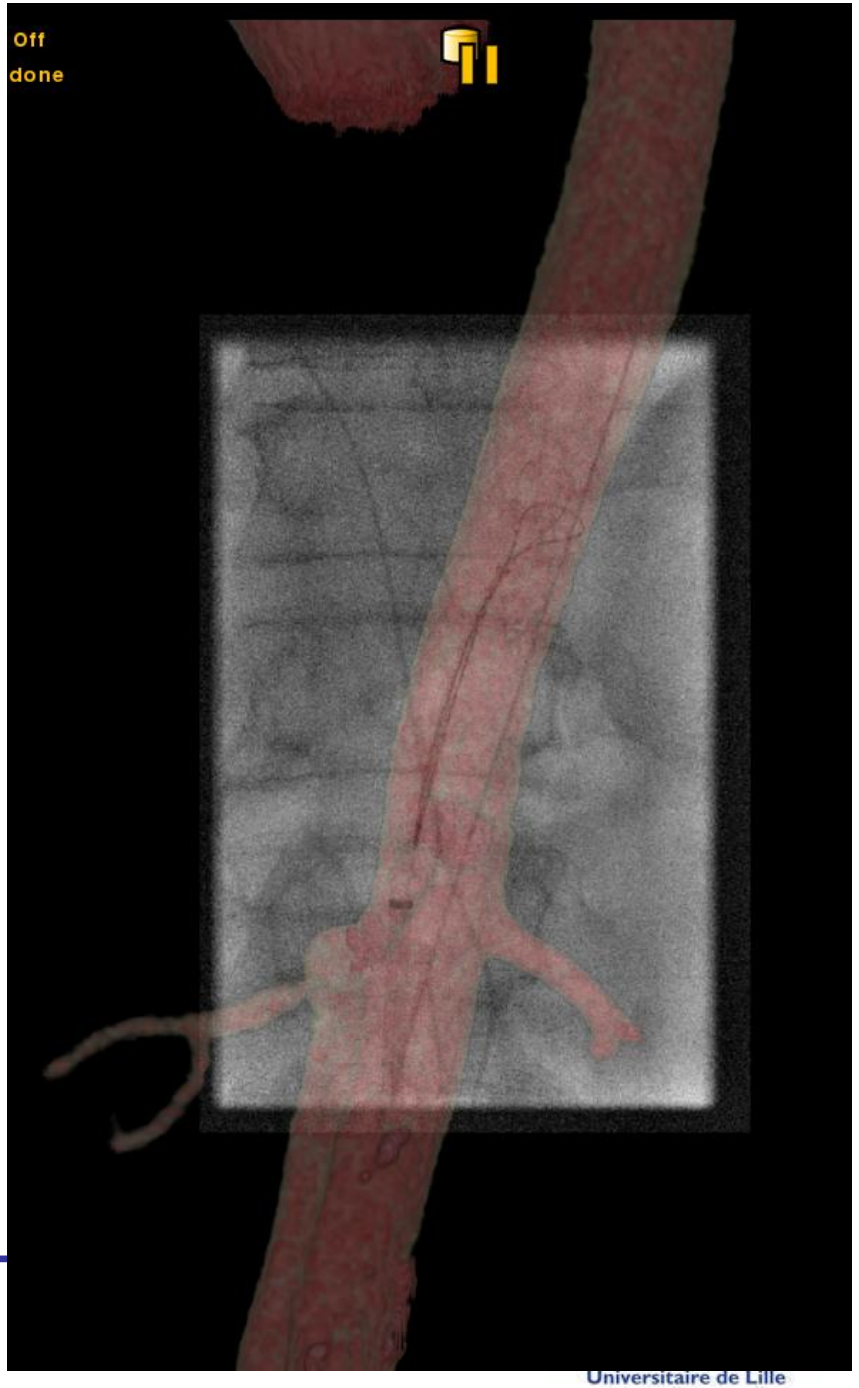
ELEPHANT TRUNK

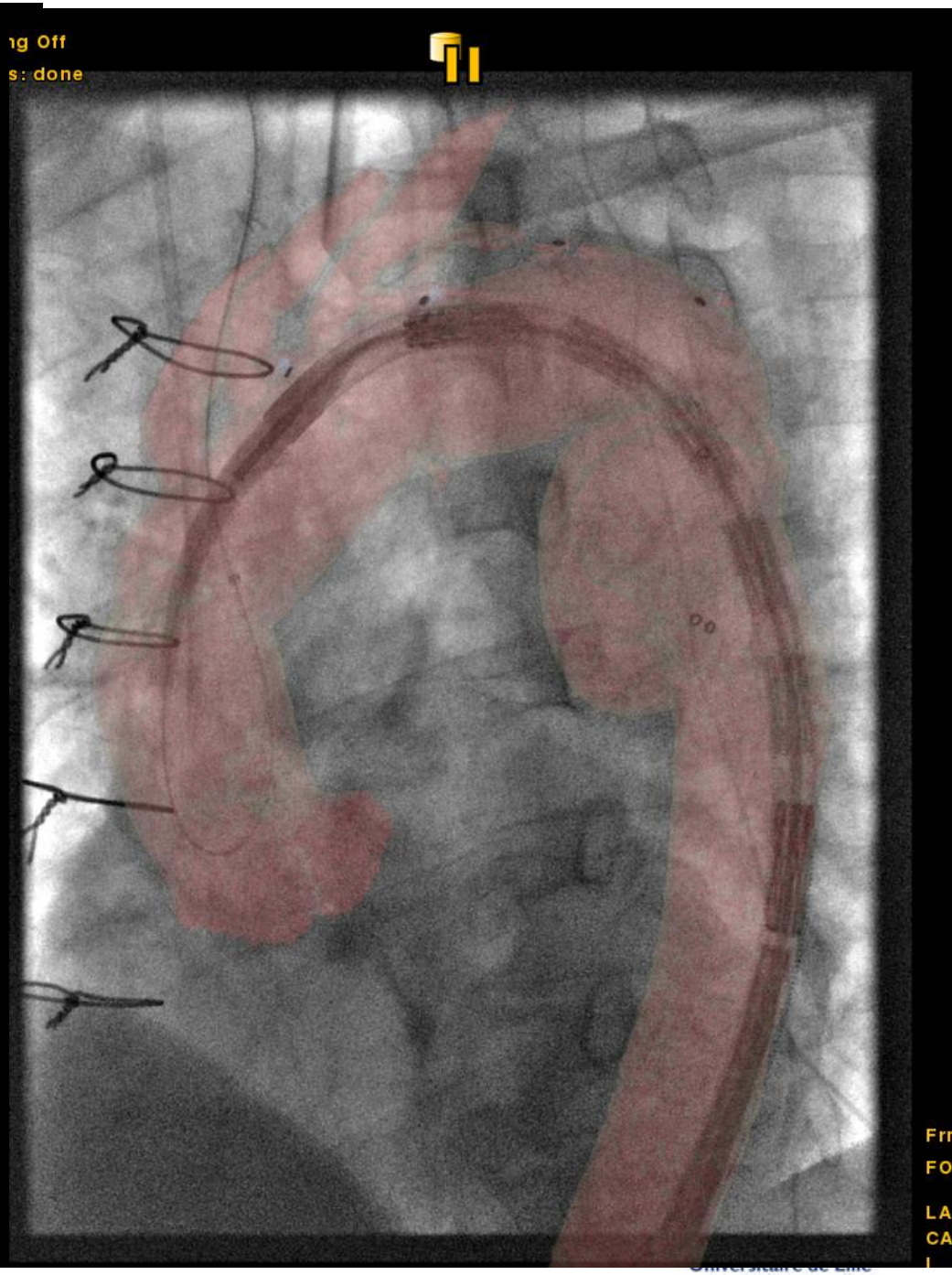


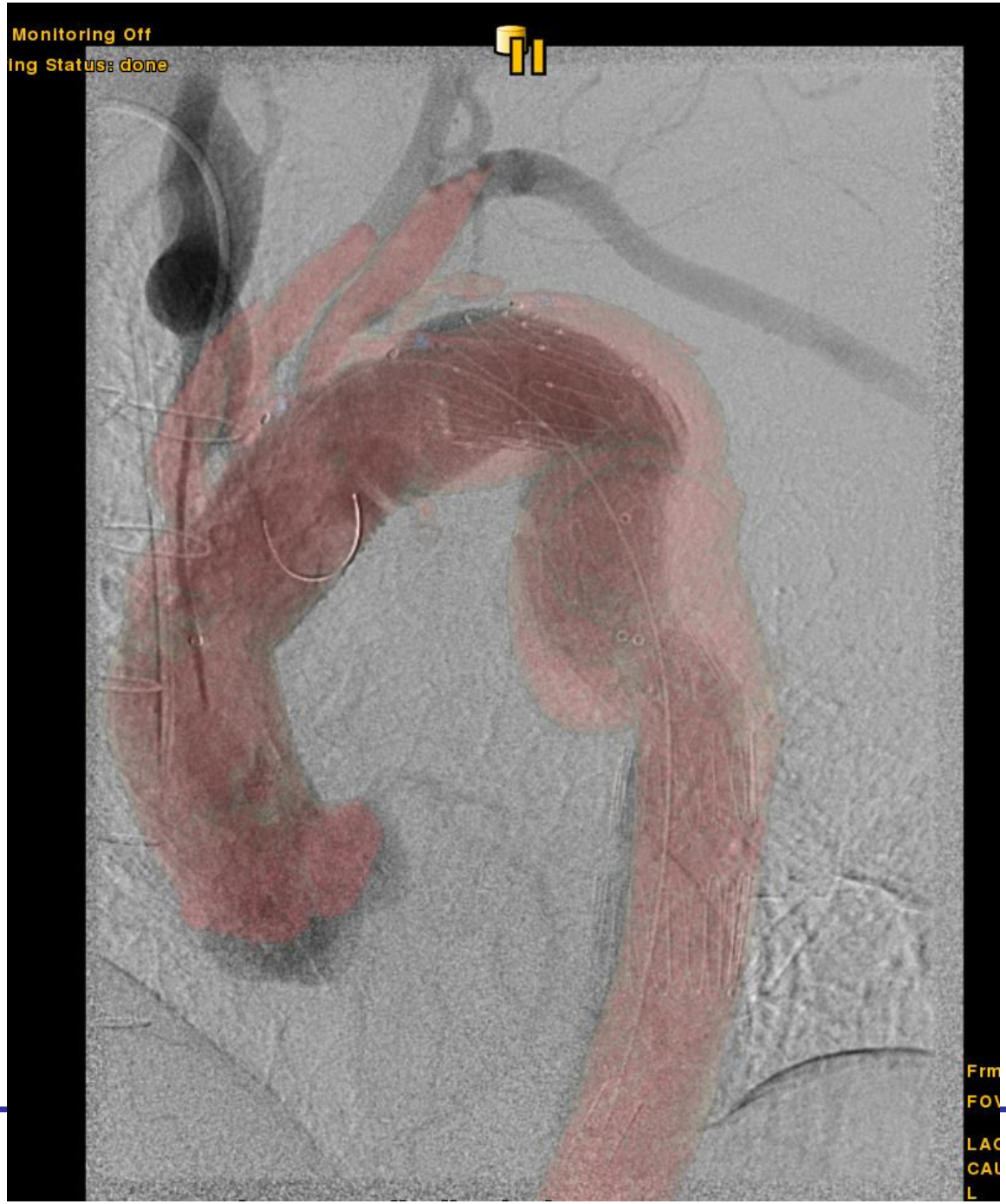




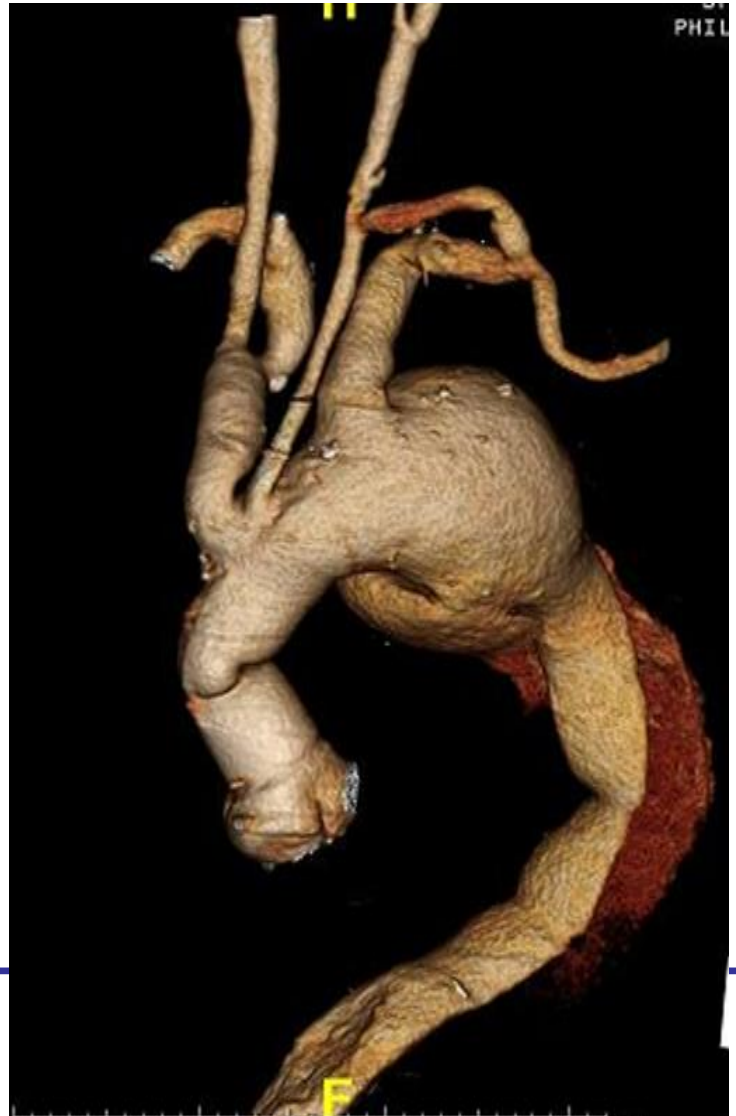



Off
done

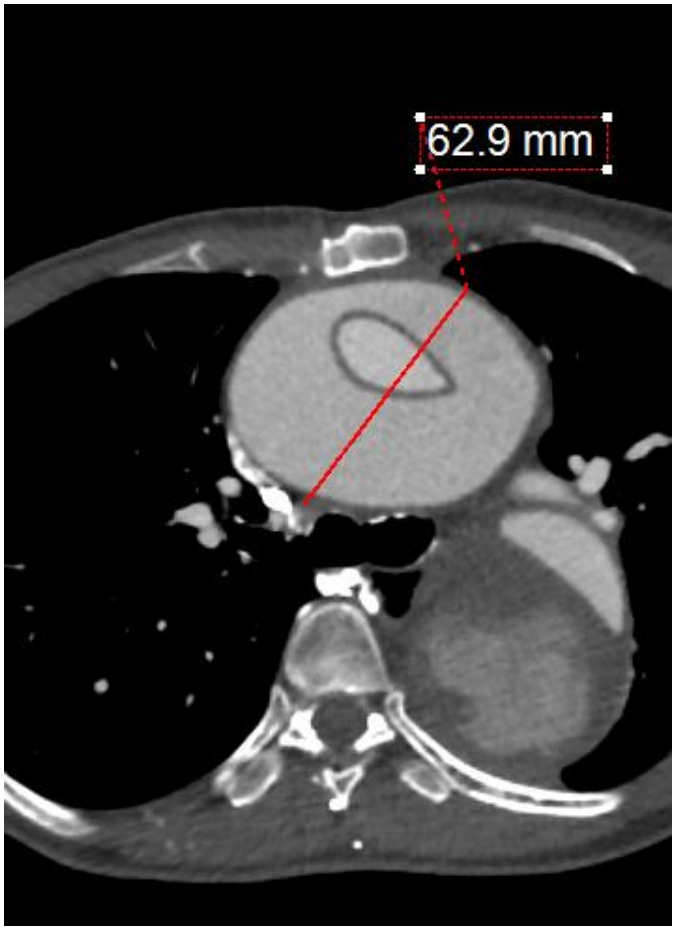



Monitoring Off
ing Status: done

Post Type A Repair
Branched Arch Endograft

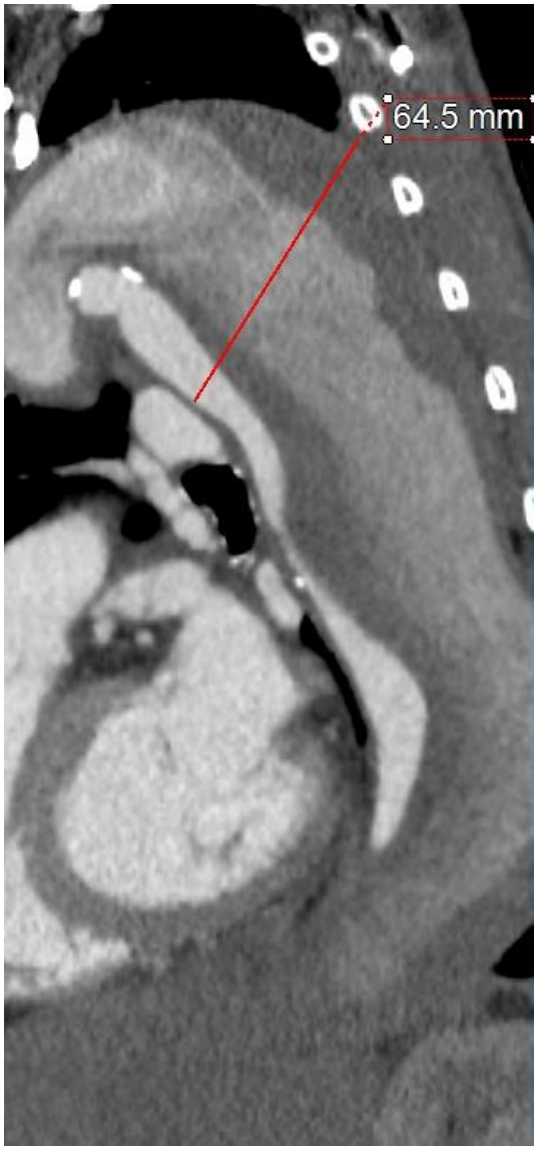


Centre Hospitalier Régional
Universitaire de Lille



Pre-operative CT

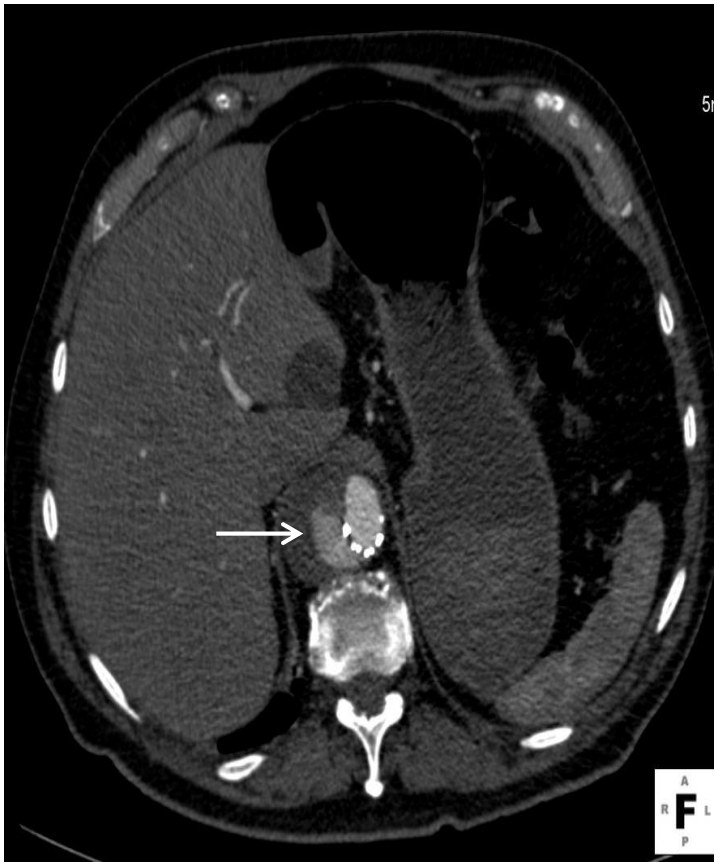
2-year control

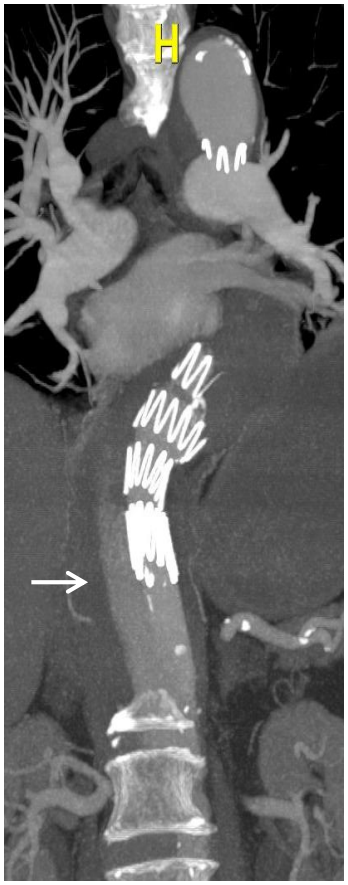


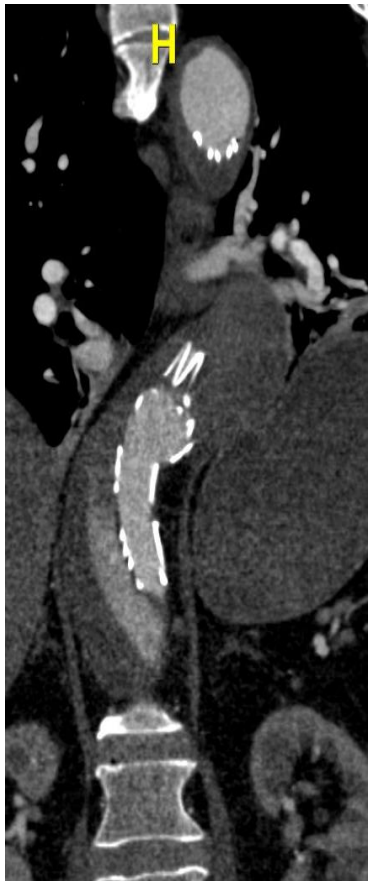
Pre-operative CT

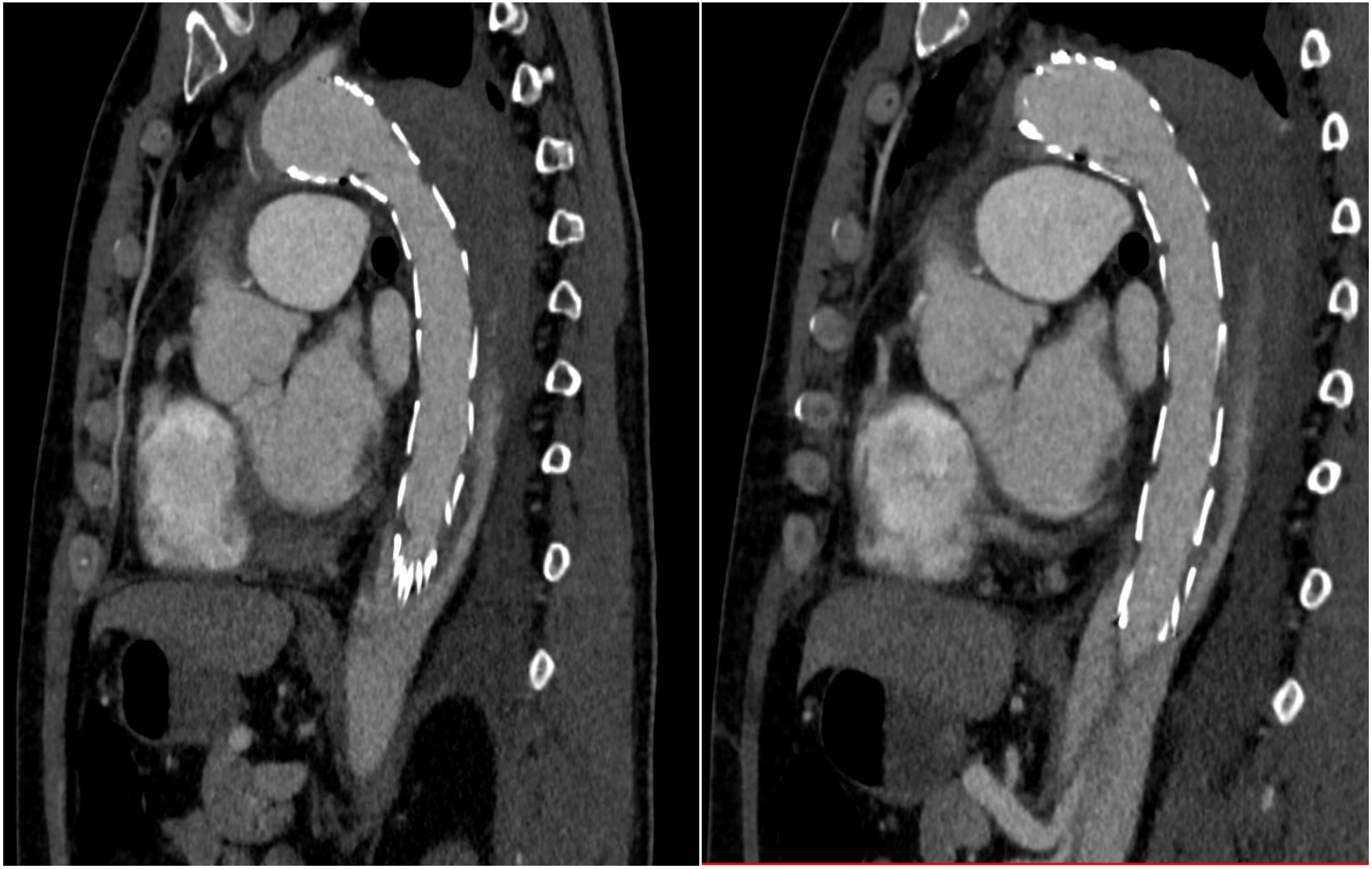
2-year control

TEVAR
DISTAL SEAL?

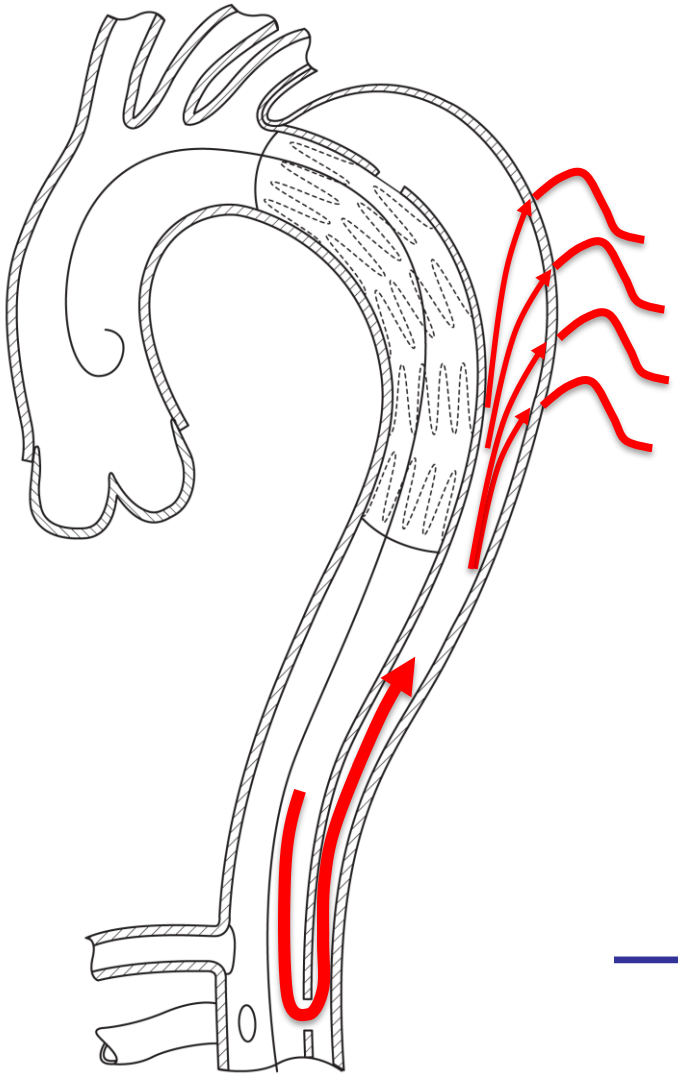








Failure to Remodel in Chronic Dissection



- Perfusion and pressure unchanged in false lumen
- Presence of Intercostals originating from false lumen
- False lumen back flow to Intercostals

Courtesy Tilo Kölbel

TEVAR in Chronic Dissections

TEVAR induces aortic remodeling :

- **False lumen thrombosis**
- **True lumen expansion**

But this remodeling is Limited to the DTA along the stentgraft

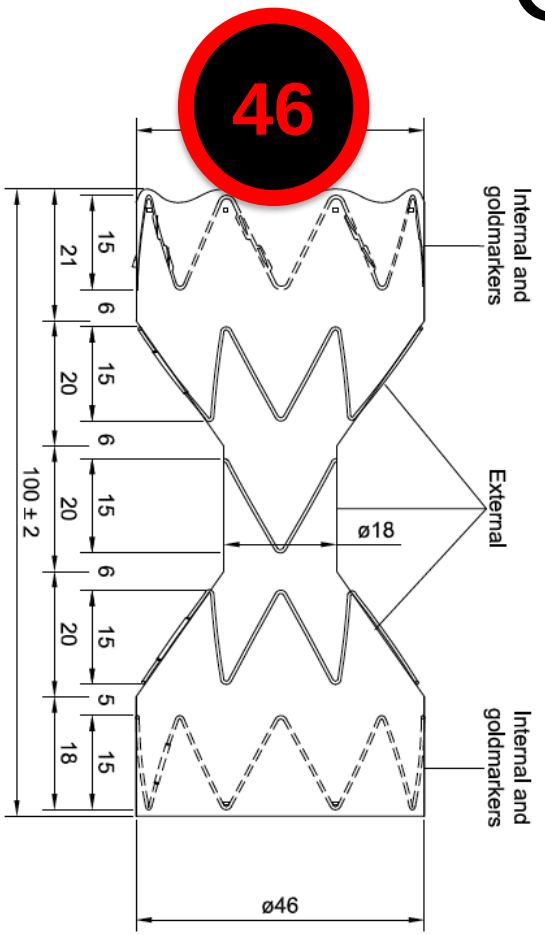
J ENDOVASC THER
2013;20:484–489

♦TECHNICAL NOTE ♦

Distal False Lumen Occlusion in Aortic Dissection With a Homemade Extra-Large Vascular Plug: The Candy-Plug Technique

Tilo Kölbel, MD, PhD; Christina Lohrenz, MD; Arne Kieback, MD; Holger Diener, MD; Eike Sebastian Debus, MD, PhD; and Axel Larena-Avellaneda, MD, PhD

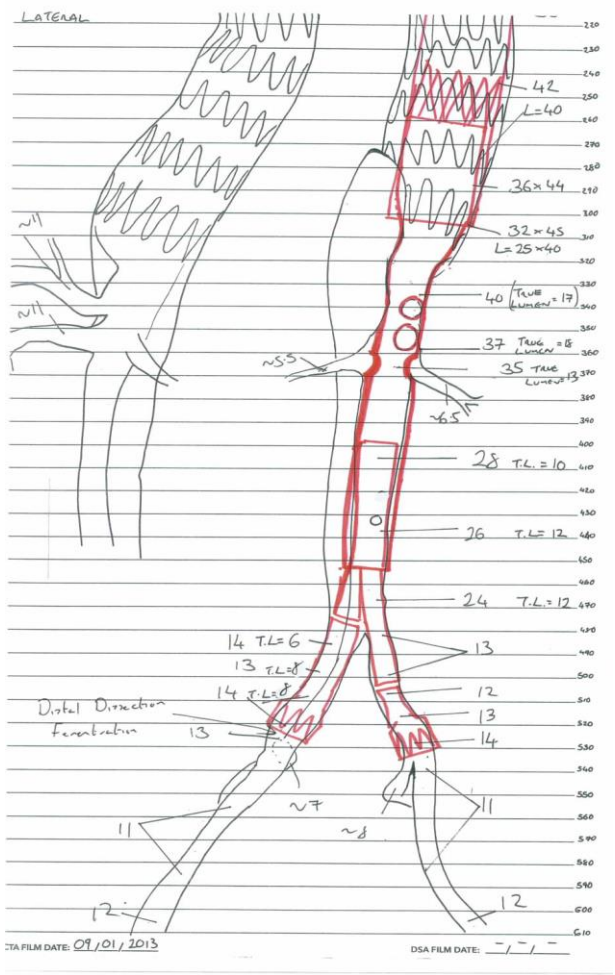
Candy-Plug

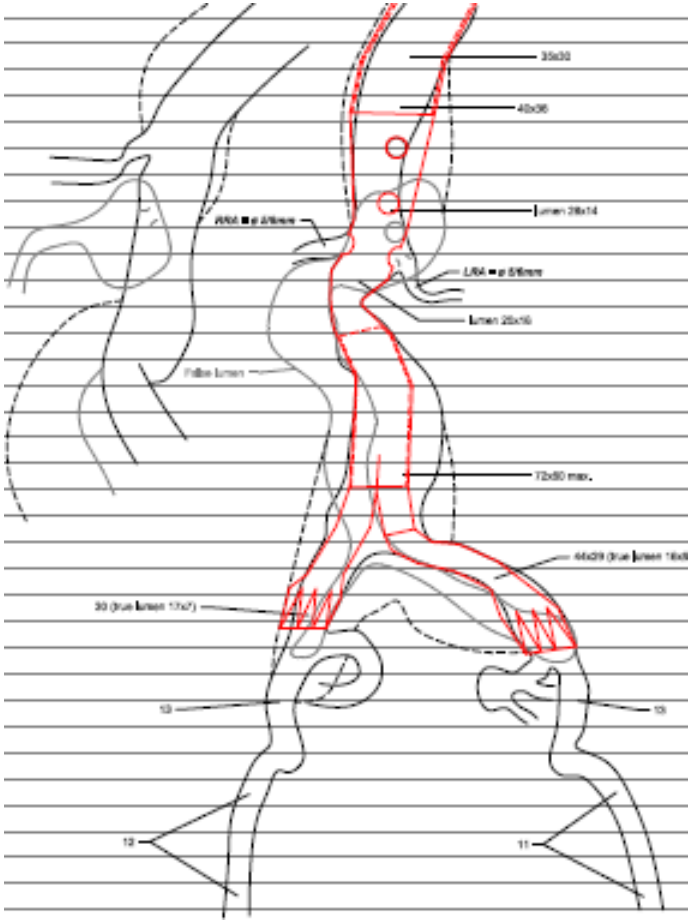


22mm Amplatzer plug II

Kölbel et al. 2013; J Endovasc Ther 20: 484-9

Fenestrated Distal Extension?

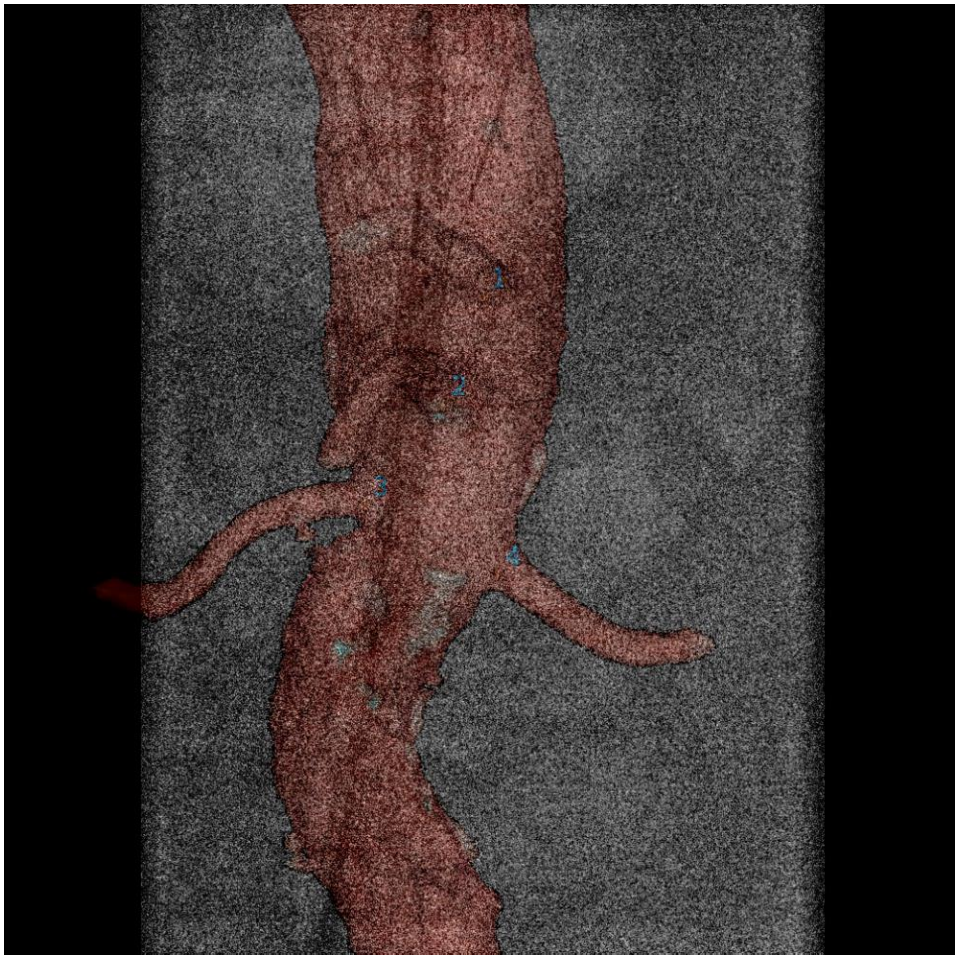




Centre Hospitalier Régional Universitaire de Lille

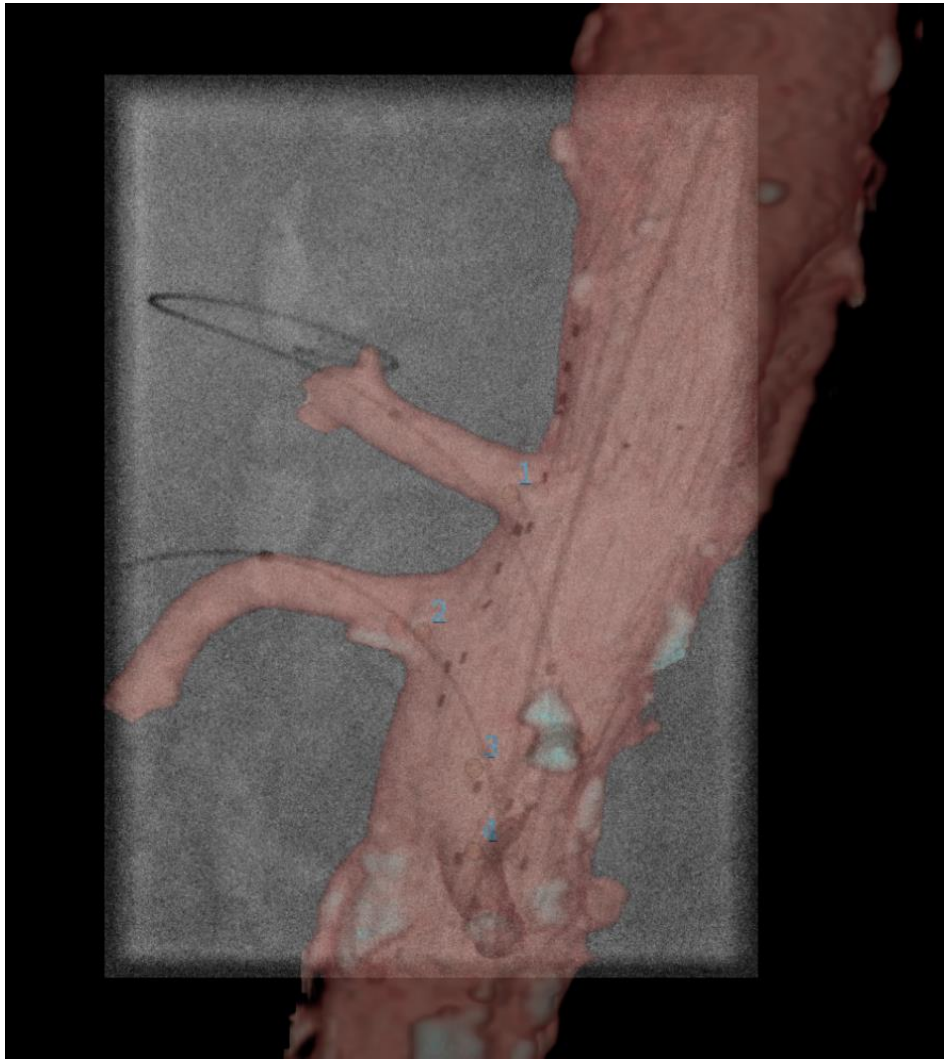
GE Discovery IGS 730

Centre Hospitalier Régional
Universitaire de Lille



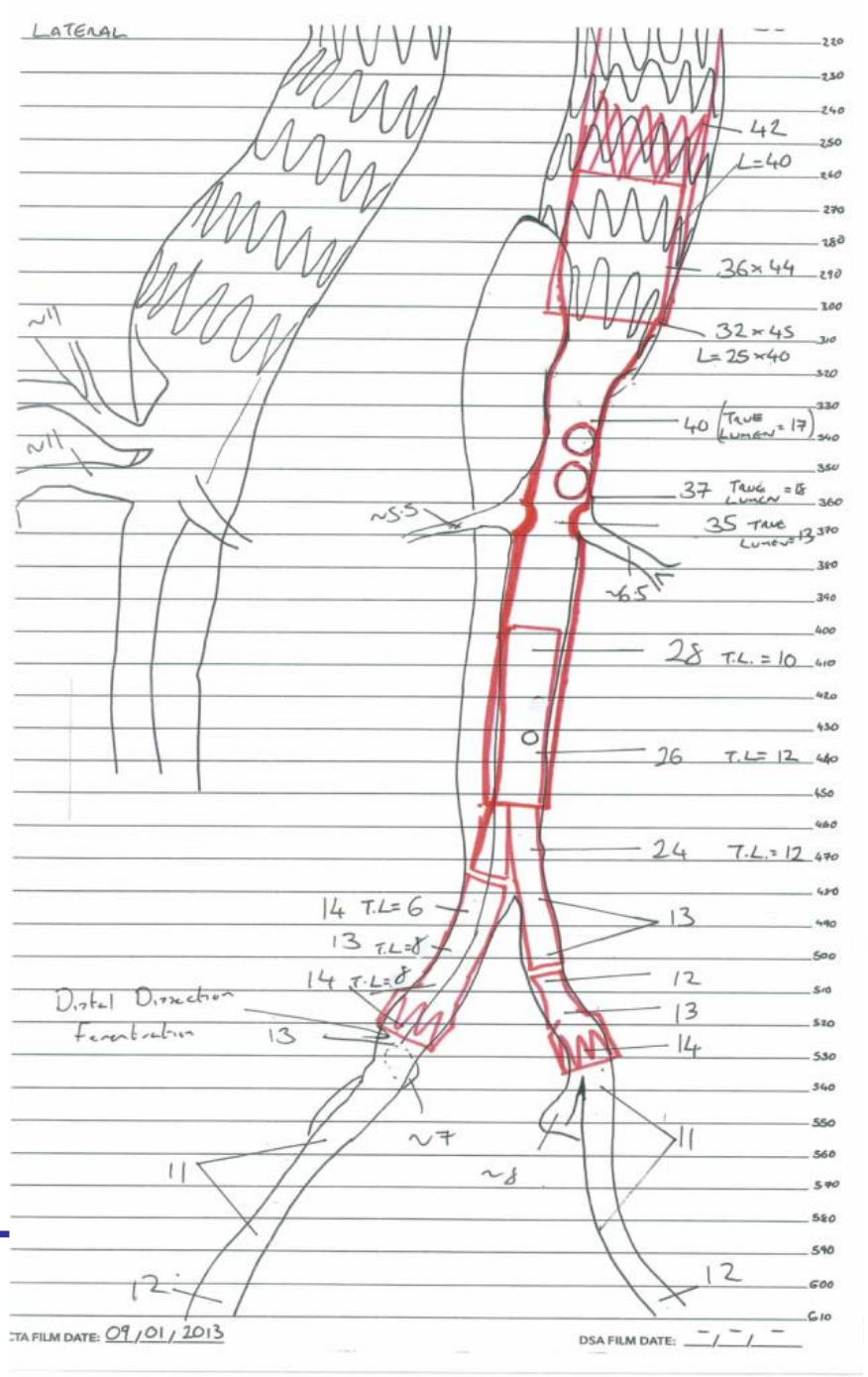
GE DISCOVERY IGS 730

Centre Hospitalier Régional
Universitaire de Lille

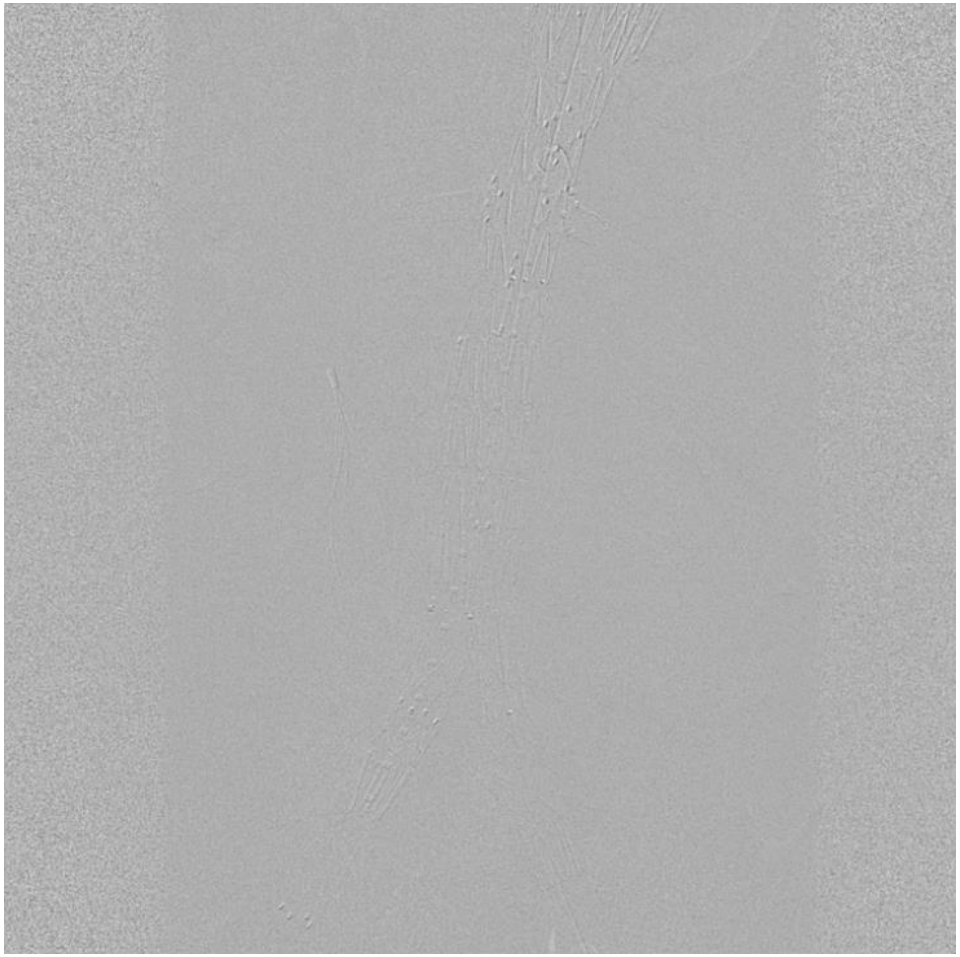


GE DISCOVERY IGS 730

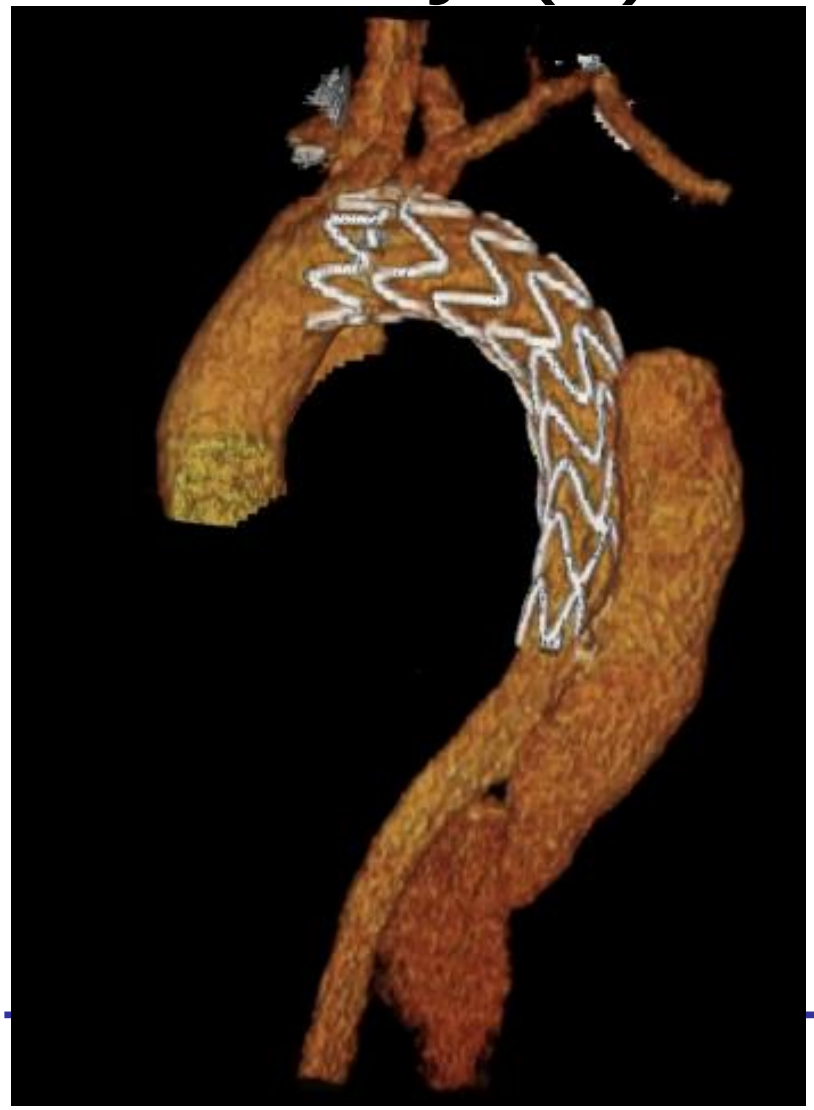
Centre Hospitalier Régional
Universitaire de Lille

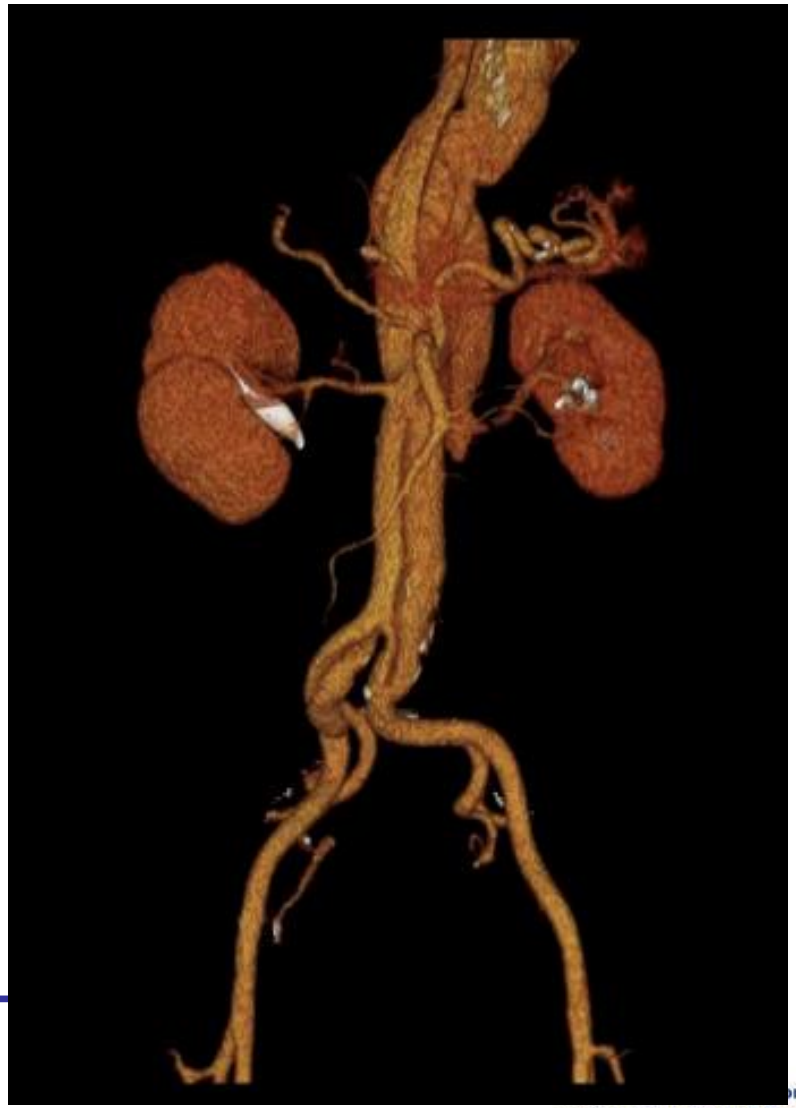


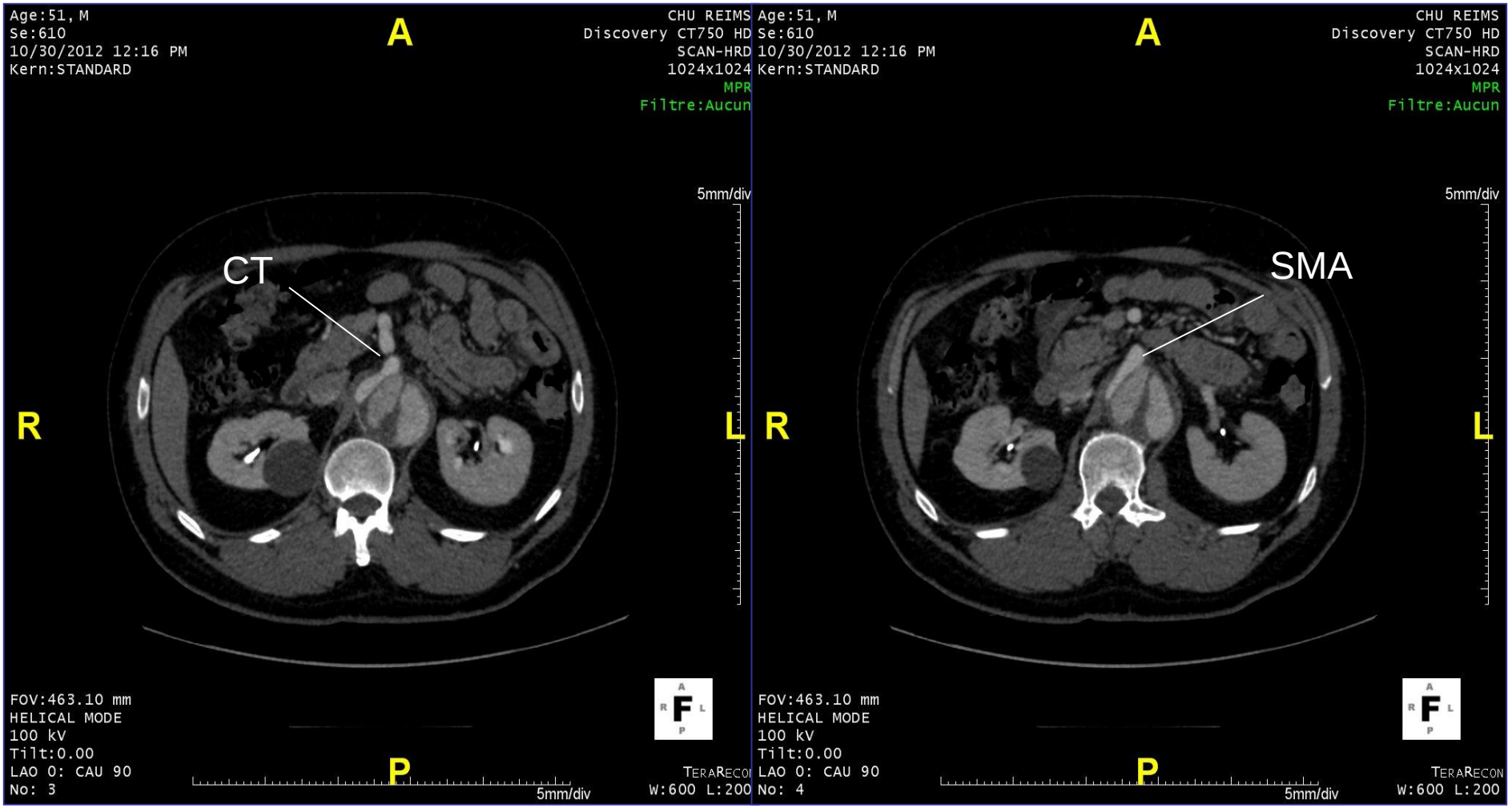
CTA FILM DATE: 09/01/2013



Left Renal Perfused by (2) False Lumen



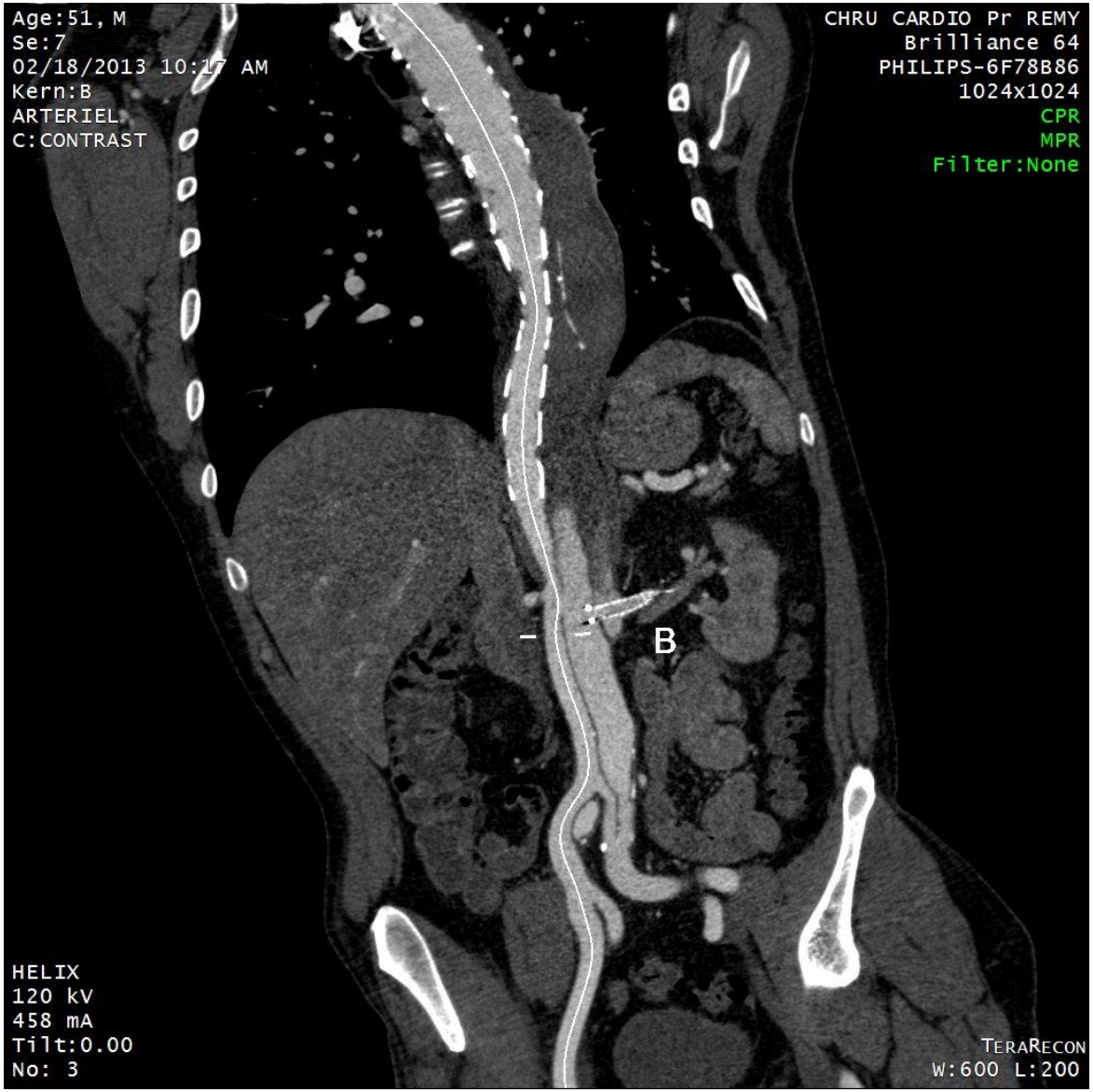


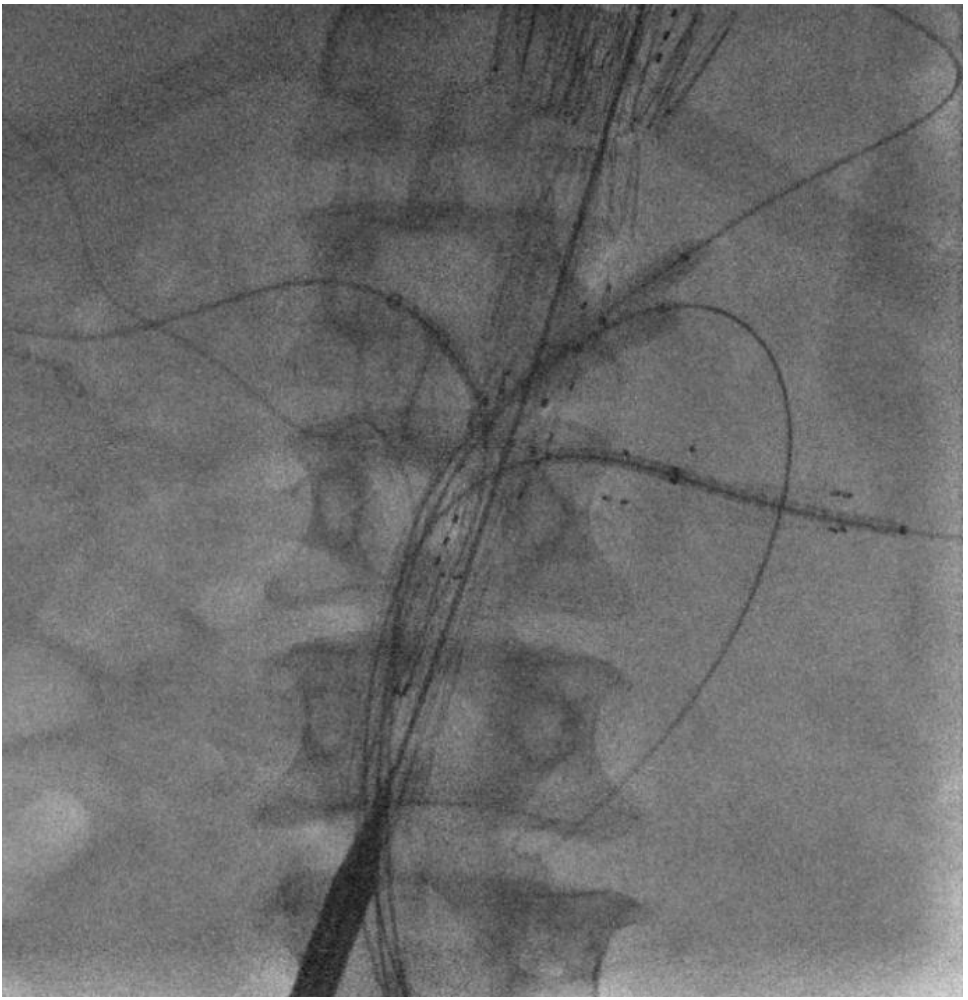


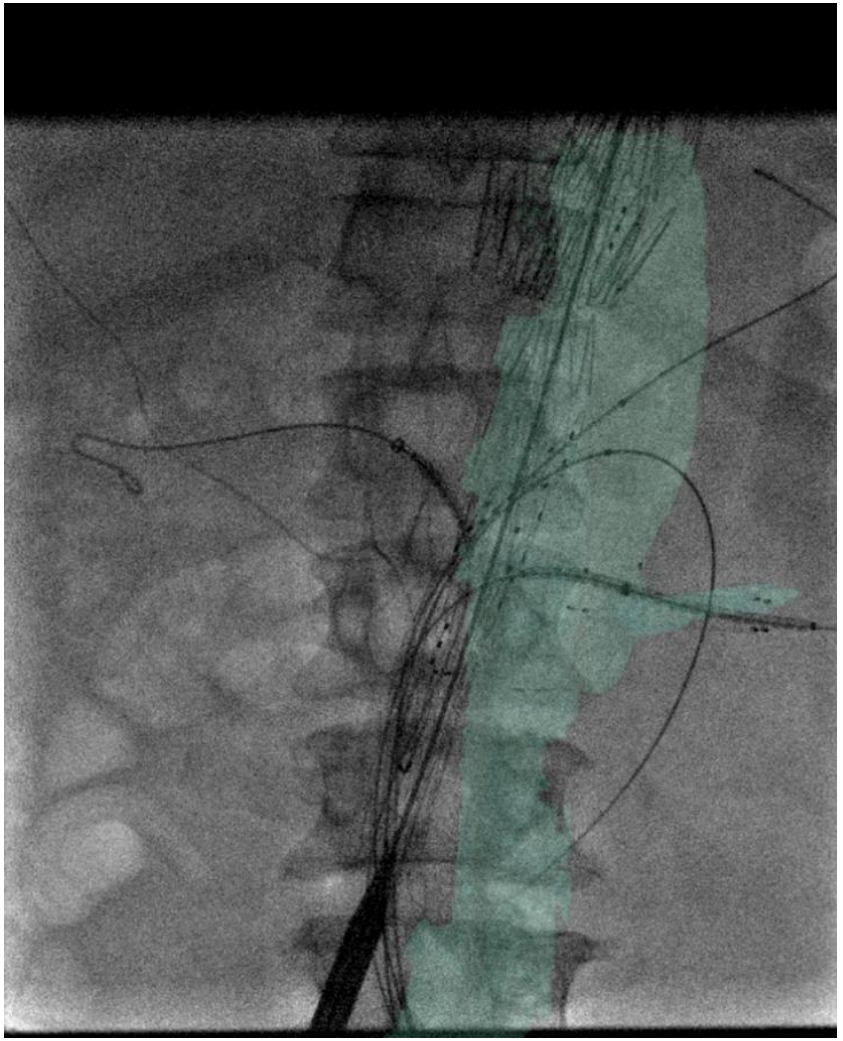
Centre Hospitalier Régional
Universitaire de Lille

Centre Hospitalier Régional
Universitaire de Lille

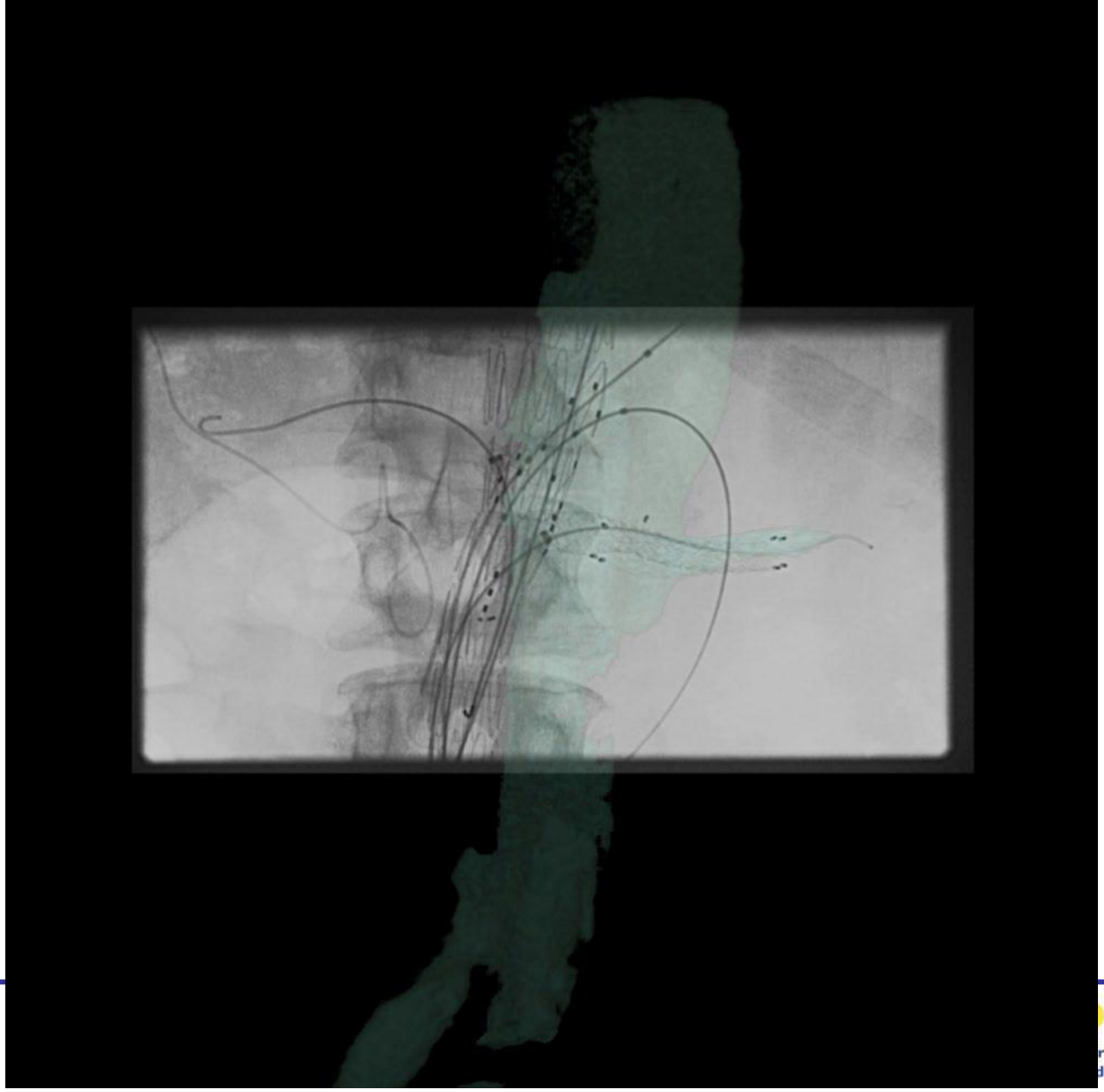

GE MEDICAL SYSTEMS
Innova Vision
Ex:
Se: 10
Im: 178
chu Lille Hal Cardiologique
DISSECTION MANAGEMENT
AW1189389577.502.1360675660
Feb 12 2013
11:49:36 AM
Mag = 1.00
FL:
ROT:


Age:51, M
Se:7
02/18/2013 10:17 AM
Kern:B
ARTERIEL
C:CONTRAST
CHRU CARDIO Pr REMY
Brilliance 64
PHILIPS-6F78B86
1024x1024
CPR
MPR
Filter:None
B
HELIX
120 kV
458 mA
Tilt:0.00
No: 3
TERARECON
W:600 L:200





pitalier Régional
itaire de Lille




Non GE image

Post TEVAR

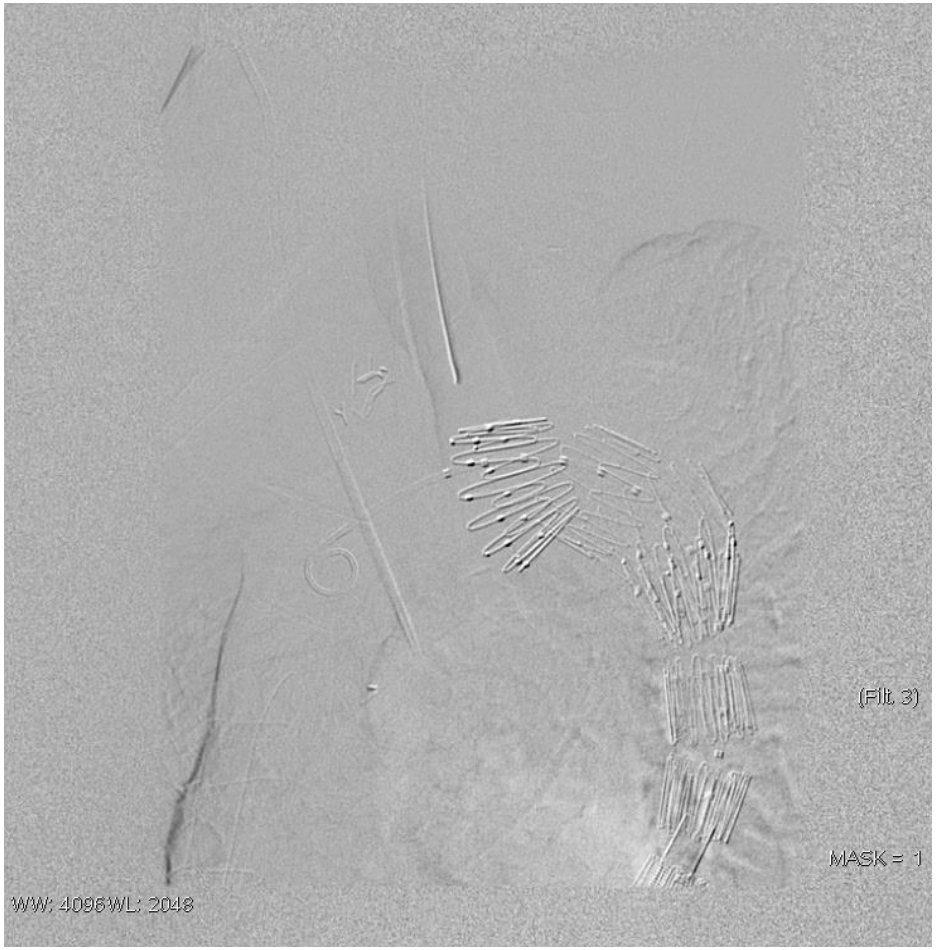
Post FEVAR

Centre Hospitalier Régional Universitaire de Lille

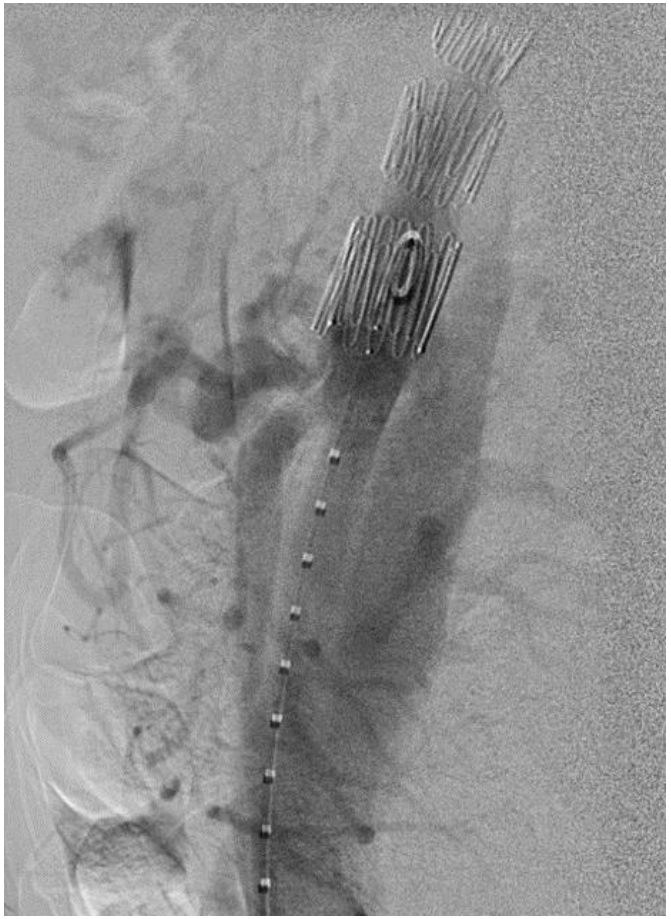
Staged Approach

- 50 yo patient
- Step 1 (2009): Acute type A dissection with ascending aortic replacement
- Step 2 (2013): Redo sternotomy
  - Tirone David + Arch repair and elephant trunk

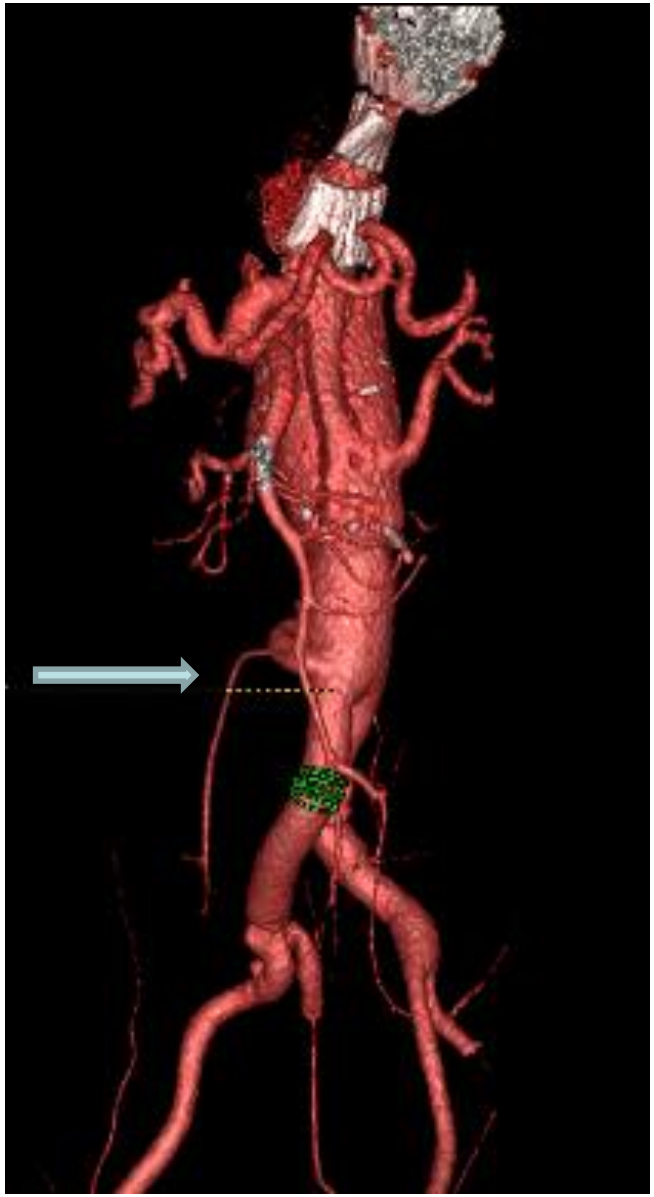
TEVAR



Step 3: TEVAR from Elephant Trunk and CT



Step 4
Aorto Bi-Iliac
Open Repair

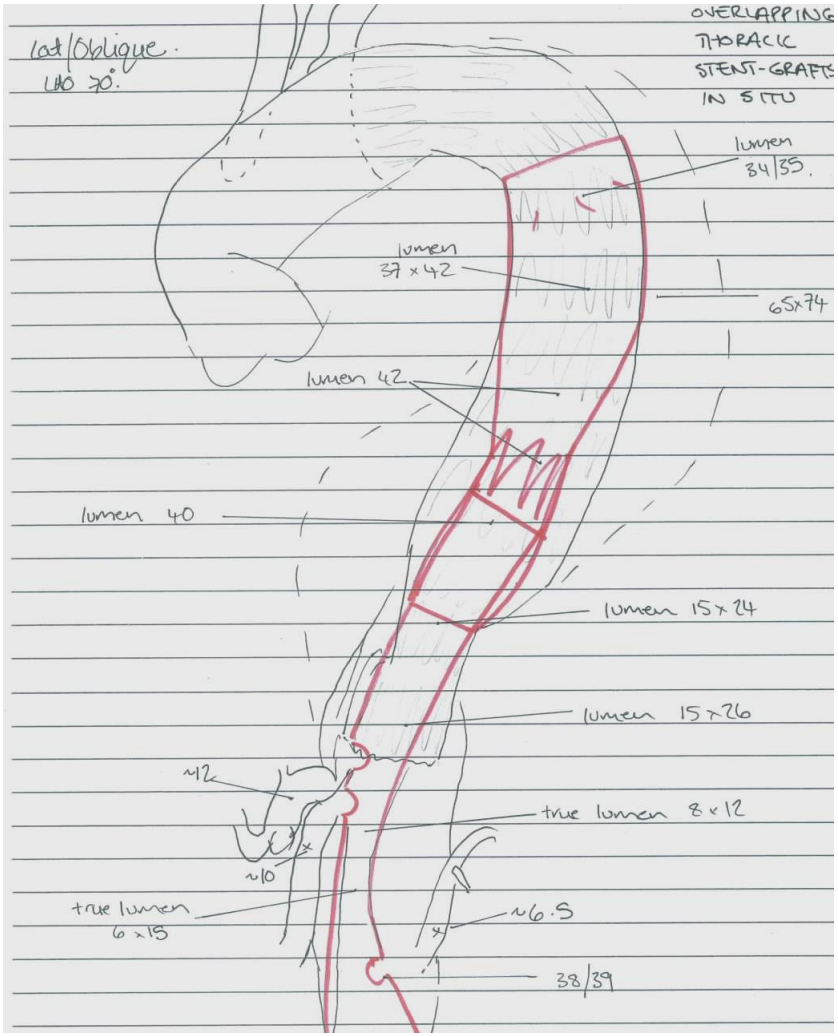


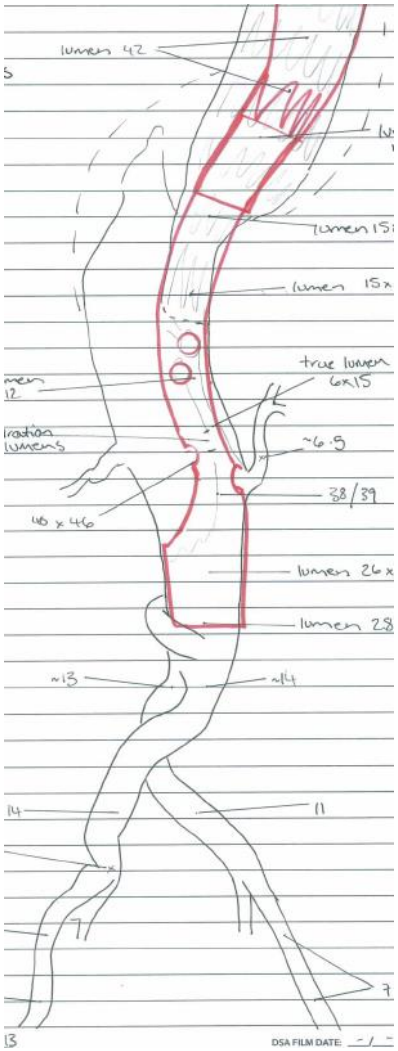
Goal:

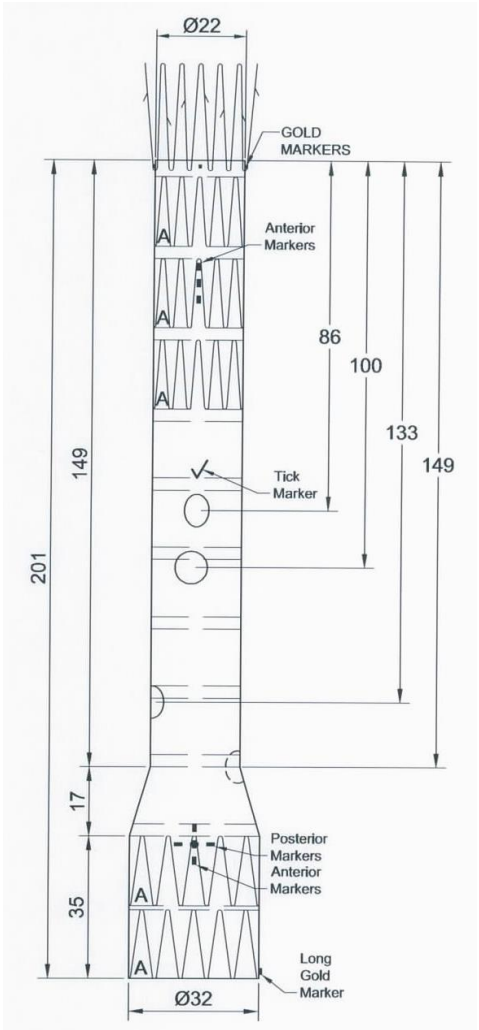
Perfusion of

- Both Internal Iliac
- Distal lumbar arteries

Step 5: Fenestrated Endograft

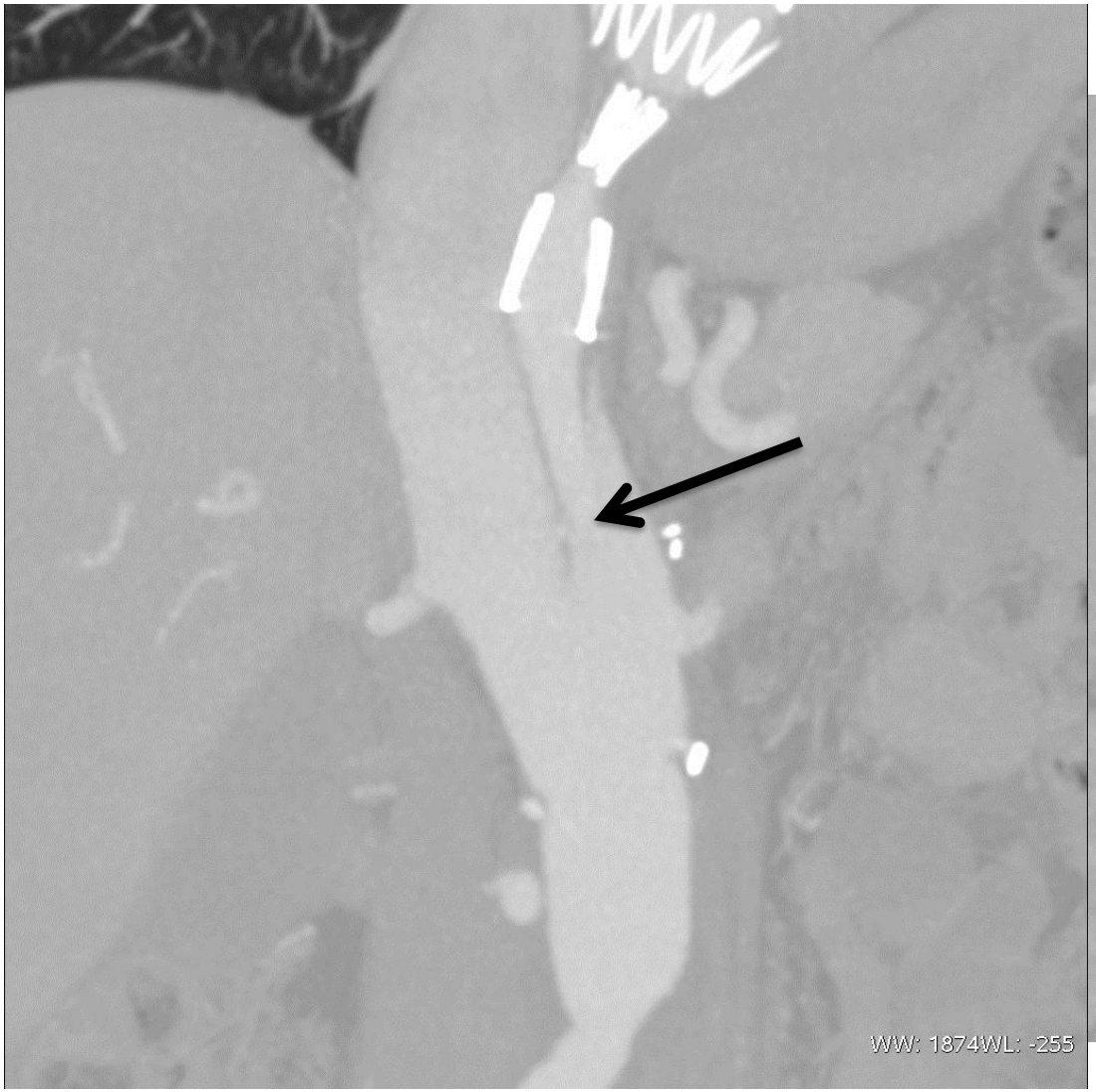


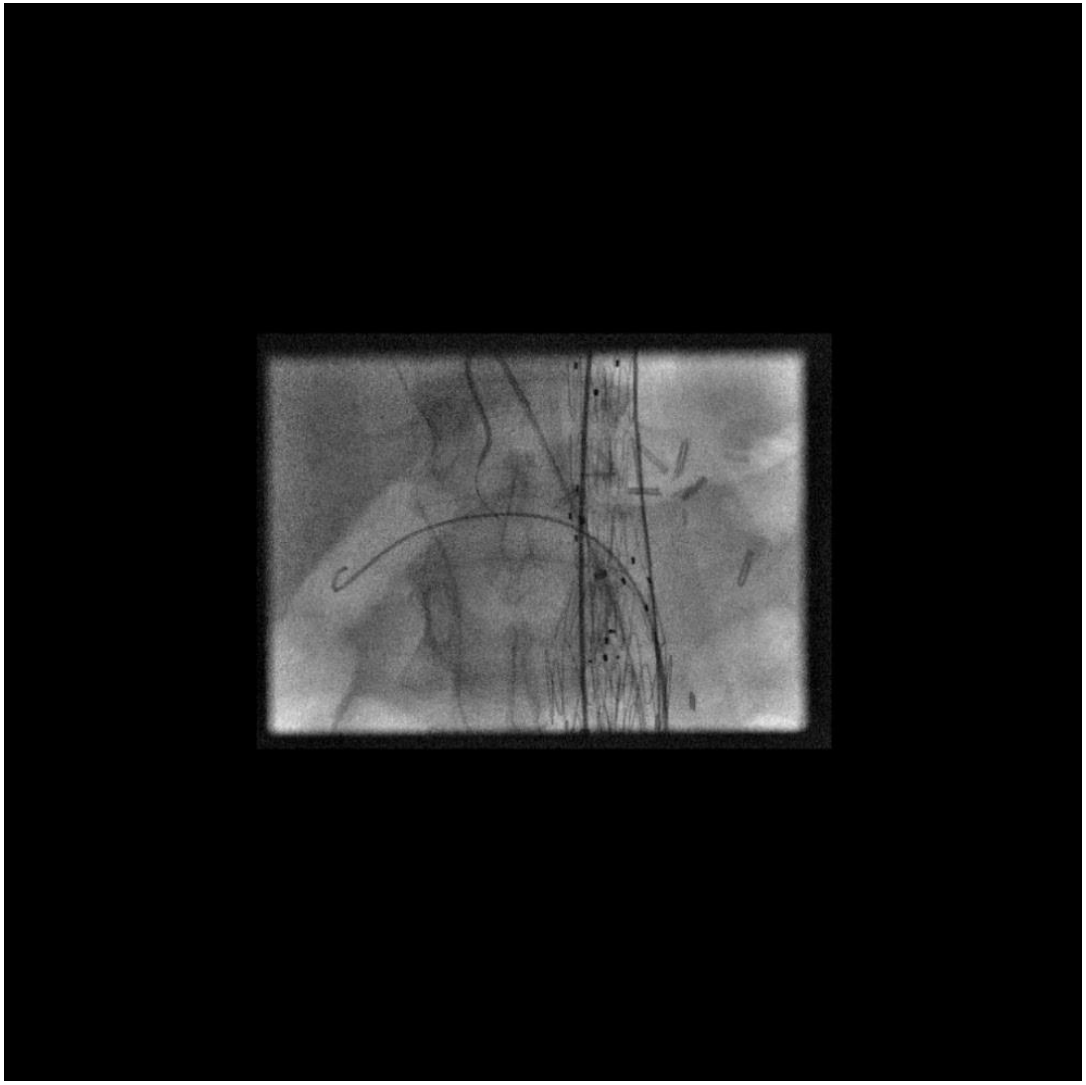


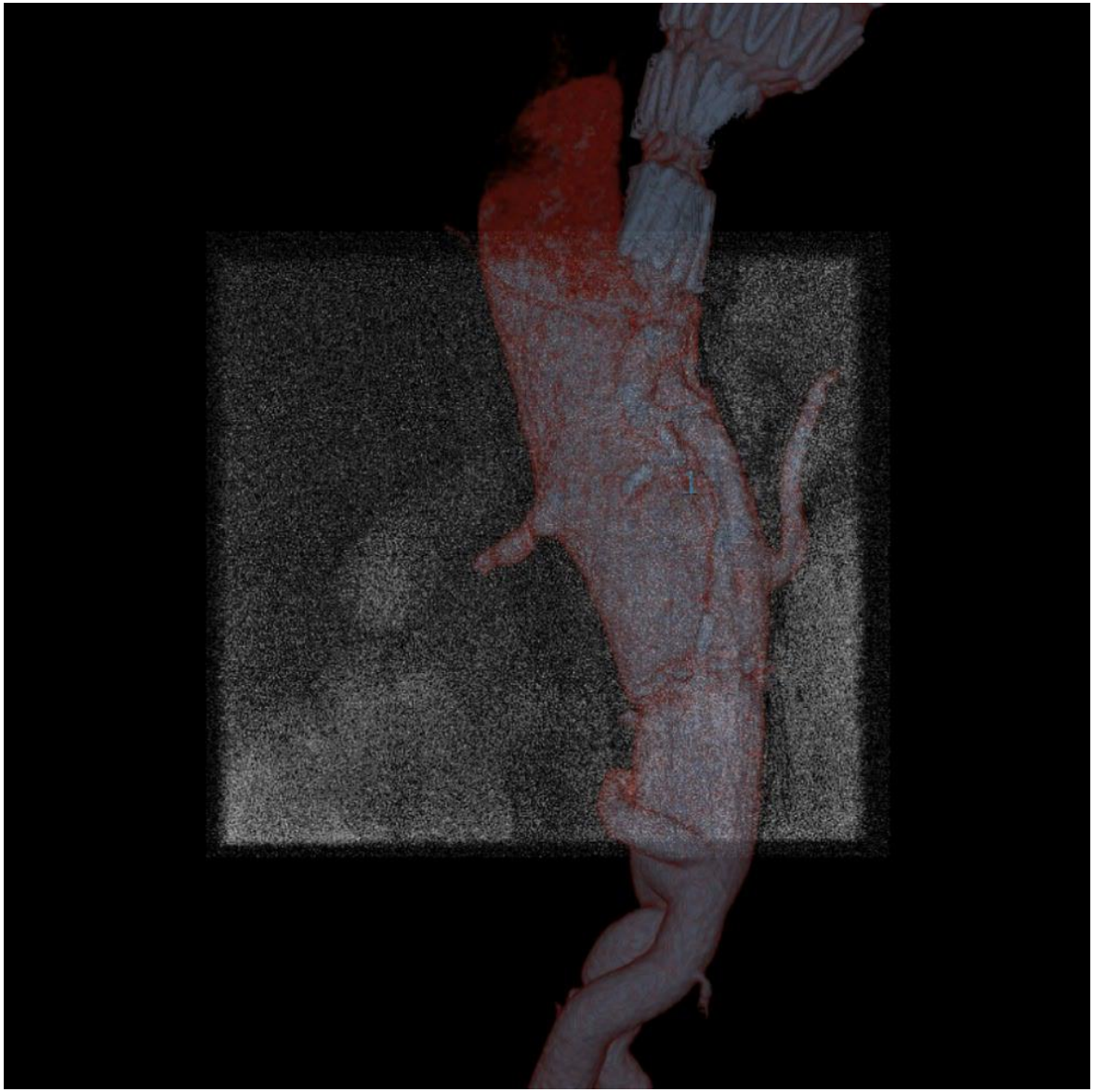


Centre Hospitalier Régional Universitaire de Lille

Small tear in front of the right renal

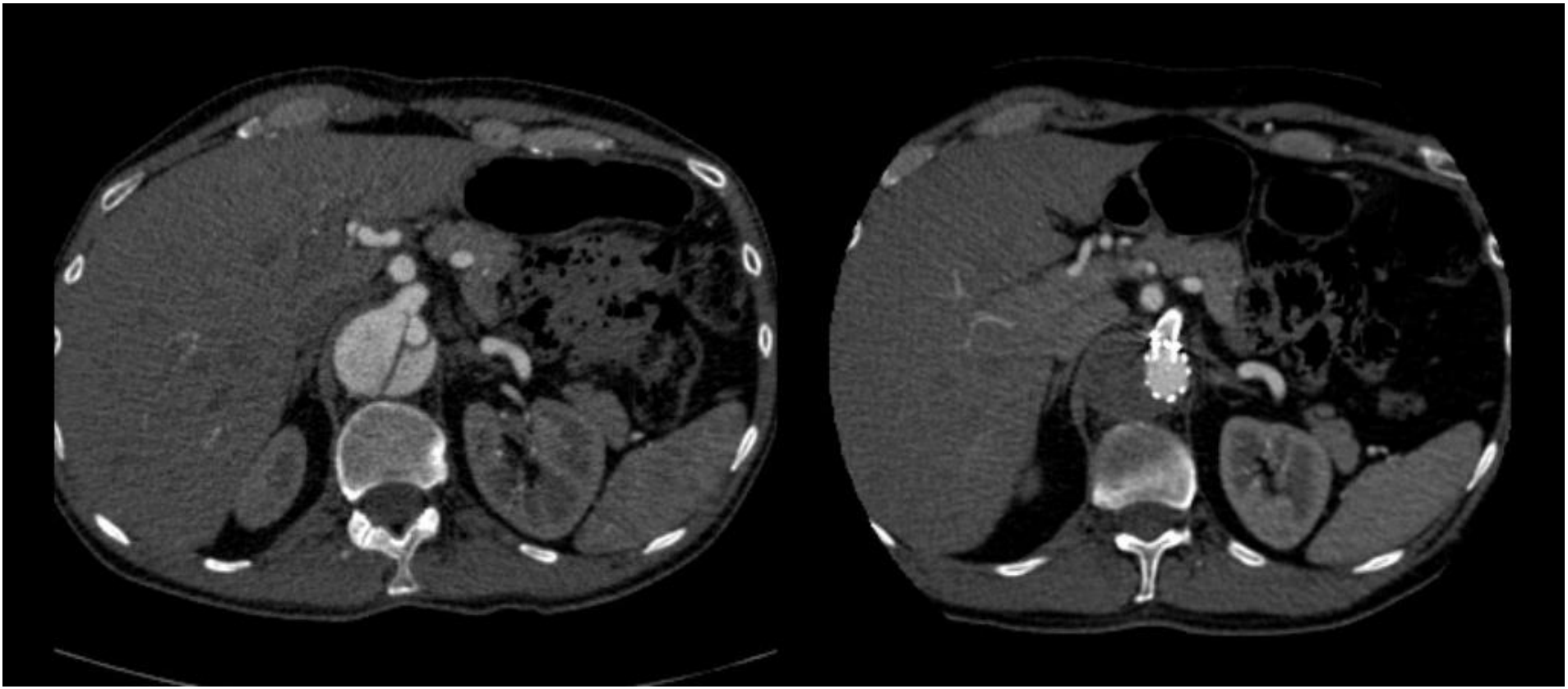




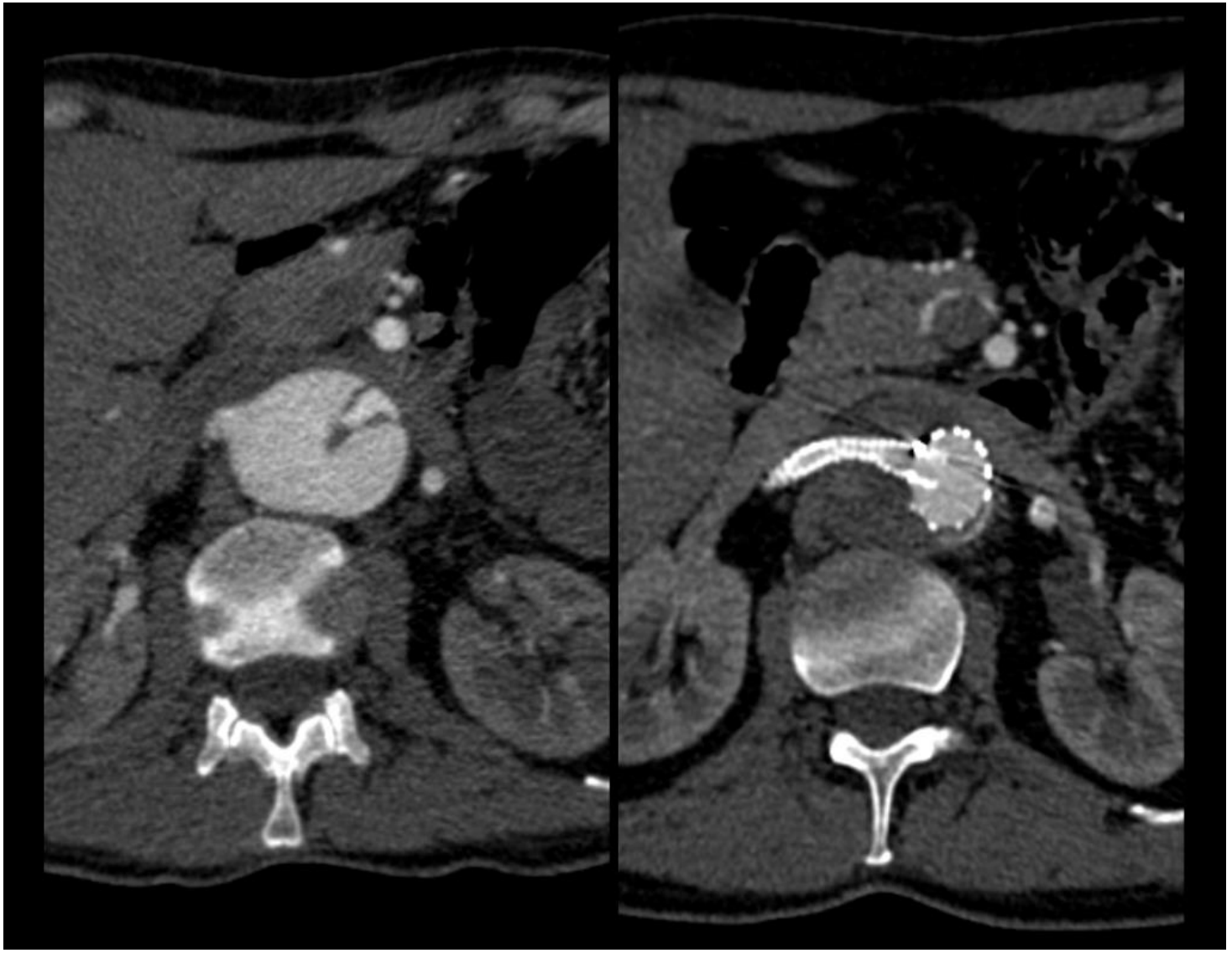



TERARECON

Expansion of true lumen

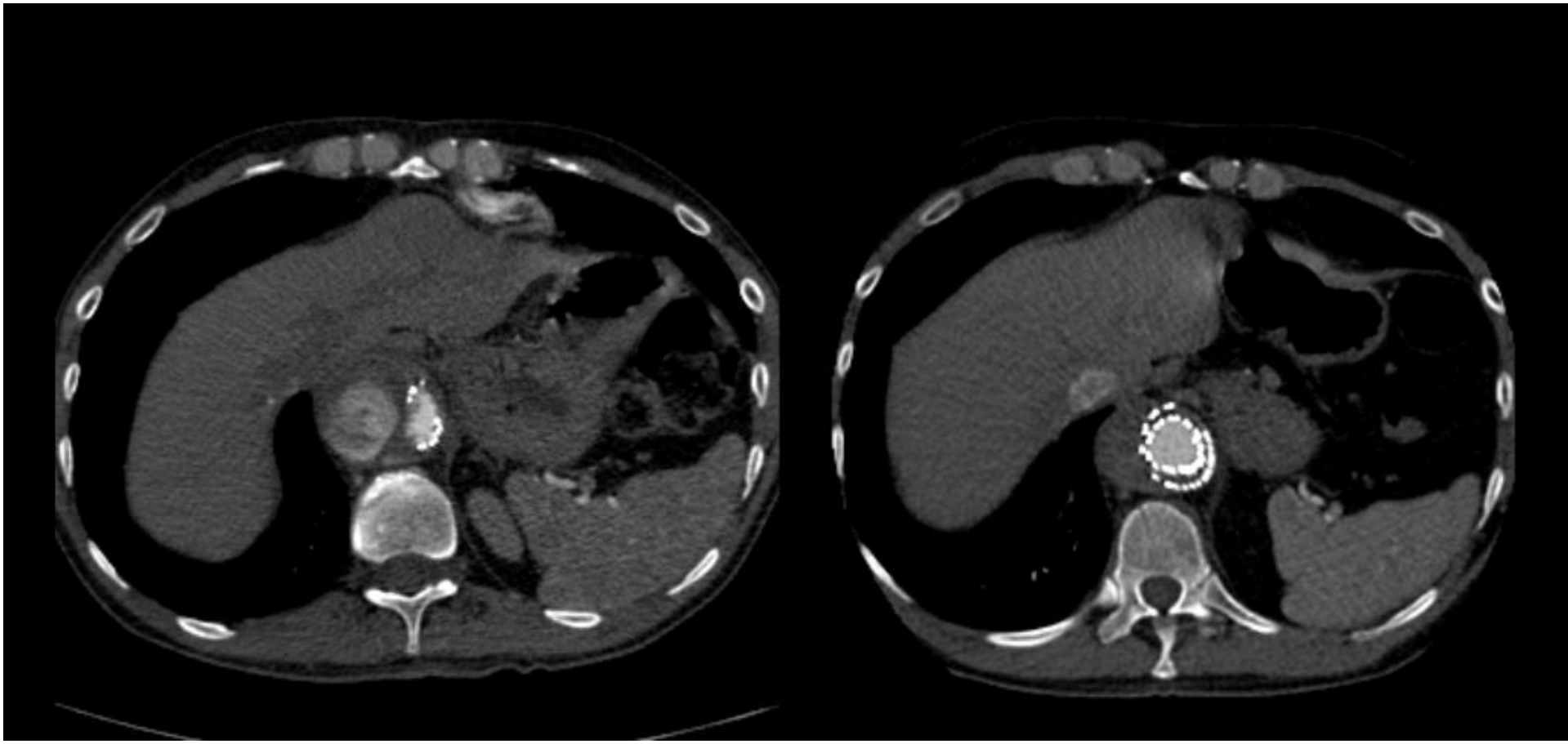


Post TEVAR **Post FEVAR**



Post TEVAR **Post FEVAR**

Centre Hospitalier Régional Universitaire de Lille



Post TEVAR **Post FEVAR**

DATA

TABLE I.—*Results of three single centre series of patients with chronic aortic dissections treated with fenestrated/branched endografts.*

	Verhoeven Nurnberg, Germany 2012	Kitagawa CCF, USA 2013	Haulon Lille, France 2014
N. of patients	6	15	15
Median age	62 (44-71)	58 (33-71)	61 (31-77)
Maximal diameter (mm - median, range)	69 (64-73)	64 (43-97)	67 (56-79)
Connective tissue disease	NA	6 (40%)	3 (20%)
Arch involvement	0	1 (7%)	6 (40%)
Previous aortic surgery (including T-EVAR)	NA	12 (80%)	11 (73%)
Median nb of fenestrations/branches	3 (0-4)/1 (0-4)	NA	4 (0-4)/2 (0-2)
Median time elapsed (in months) between acute onset and complex EVAR (median, range)	32 (10-123)	124 (24-408)	48 (12-360)
Staged procedure (TM only)	NA	78%	45%
Technical success	100%	NA	100%
30d-mortality	0	0	1 (7%)
Reintervention	NA	8 (53%)	2 (13%)
Mean FU (months)	9 (3-15)	20 (1-62)	12 (1-36)

Eur J Vasc Endovasc Surg (2016) 51, 488–497

Early Experience of Endovascular Repair of Post-dissection Aneurysms Involving the Thoraco-abdominal Aorta and the Arch

R. Spear [a], J. Sobocinski [a], N. Settembre [b], M.R. Tyrrell [c], S. Malikov [b], B. Maurel [a], S. Haulon [a,*]

[a] Aortic Center, Hôpital Cardiologique, CHRU Lille, France
[b] Vascular Surgery, CHU Nancy, France
[c] King's Health Partners, London, UK

Table 4. Early outcomes.

	Major adverse events, *n* (%)	In hospital mortality, *n* (%)	Spinal cord ischemia, *n* (%)	Secondary procedures, *n* (%)	Type 1 endoleak, *n* (%)
Aortic arch aneurysm ($n = 7$)	2 (28.5)	1 (14)	0 (0)	2 (28.5)	1 (14)
TAAA ($n = 16$)	3 (19)	1 (6)[a]	1 (6)[a]	0 (0)	1 (6)
Total ($n = 23$)	5 (22)	2 (8.7)	1 (4.4)	2 (8.7)	2 (8.7)

CONCLUSIONS

- Simple to very complex
- 3D WS analysis
- No compromise