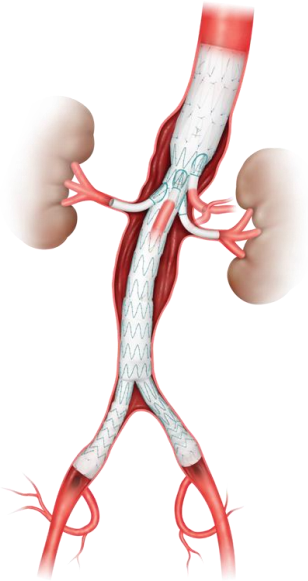
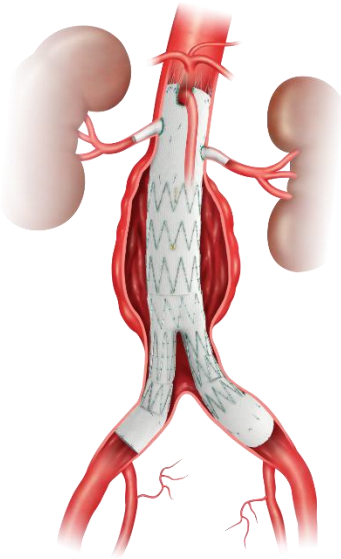
Patient's Selection and Technical Refinements to Make F-BEVAR Successful



Stéphan Haulon,
J Sobocinski, A Hertault, R Azzaoui

Aortic Center,
CHRU de Lille, France



CACVS 2017

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Disclosures

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

Open vs Endo

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association®

Contemporary Analysis of Descending Thoracic and Thoracoabdominal Aneurysm Repair: A Comparison of Endovascular and Open Techniques

Roy K. Greenberg, Qingsheng Lu, Eric E. Roselli, Lars G. Svensson, Michael C. Moon, Adrian V. Hernandez, Joseph Dowdall, Marcelo Cury, Catherine Francis, Kathryn Pfaff, Daniel G. Clair, Kenneth Ouriel and Bruce W. Lytle

Circulation. 2008;118:808-817; originally published online August 4, 2008;
doi: 10.1161/CIRCULATIONAHA.108.769695
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

Print ISSN: 0009-7322. Online ISSN: 1524-4539

Table 3. Patient Characteristics for Open and Endovascular Repair Techniques

Patient Characteristics	SR (n=372)	ER (n=352)	*P*
Age, mean±SD	62.7±13	71.3±12	<0.001
Male gender, %	64	65	0.6
Black, %	10	7	0.1
Smoking, %	54	62	0.03
Diabetes mellitus, %	5	11	0.003
Cardiac			
History of CAD, %	33	50	<0.001
EF, mean±SD*	54.4±8.8	52.5±11.8	0.02
EF <0.30, %	3	6	0.03
Pulmonary			
History of COPD, %	17	30	<0.001
FEV1*	2.2±0.8	1.7±0.8	<0.001
FEV1 <1 L, %*	3	20	<0.001
FEF 25% to 75%*	1.7±0.9	0.9±0.7	<0.001
FEF 25% to 75% <30% of expected, %*	32	52	0.001
History of cancer, %	9	13	0.09
BMI, mean±SD*	27.5±10.2	26.8±5.1	0.4
Renal			
GFR, mean±SD†	77.7±30	66.1±28.5	<0.001
<40, %	9	17	0.001
<60, %	28	40	0.001
Aortic diameter, cm, mean±SD	6.2±1.3	6.3±1.3	0.9
Extent of aneurysm repair, %			
0	36	46	<0.0001
I	14	23	
II	16	5	
III	17	6	
IV	17	20	
Chronic dissections, %	30	13	<0.001
History of surgery for proximal aorta, %	31	18	<0.001
History of surgery for distal aorta, %	16	28	<0.001

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	Repair	n	Mortality at 30 days			Mortality at 1 year			SCI	
			n	%*	Rate**	n	%*	Rate**	n	%
0	ER SR	163 136	8 8	5 4	0.62 0.73	20 15	12 11	0.14 0.13	1 1	1 1
I	ER SR	82 51	6 1	7 2	0.94 0.24	15 2	19¶ 4	0.25 0.04	8 7	10 14
II	ER SR	16 59	1 10	6 17	0.80 2.36	5 13	36 22	0.45 0.30	3 13	19 22
III	ER SR	22 62	2 8	9 12	1.16 1.68	7 13	34 21	0.52 0.27	1 6	5 10
IV	ER SR	69 64	3 4	4 6	0.55 0.80	8 16	12 22	0.18 0.30	2 1	3 2
All	ER SR	352 372	20 31	6 7	0.72 1.07	55 59	16 15	0.21 0.19	15 28	4 8

Greenberg et al, Circulation 2008

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Lille Aortic Center

- October 2004 - December 2016
- 468 F-BEVAR
- Mean aneurysm diameter: 60mm (42-103)

Crawford Classification

- Type 1: 11 (2.3 %)
- Type 2: 44 (9.4 %)
- Type 3: 166 (35.5 %)
- Type 5: 14 (3 %)

- Type 4: 138 (29.5 %)
- Juxta+ Pararenals: 95 (20.3 %)

COMORBIDITIES

- ASA 3 & 4: 95%
- CAD: 209 (44 %)
- COPD: 172 (37 %)
- CKD : 112 (24 %)

DEVICE

- Fenestrated grafts: 396 (85 %)
- Branched grafts: 48 (10 %)
- Branched and Fenestrated grafts: 24 (5 %)

PROCEDURE

	PROCEDURE TIME (MIN)	Contrast (ml)	Fluoroscopy time (sec)
AVERAGE	195	129	2579
MEDIAN	180	120	2252
MIN	65	30	338
MAX	675	466	9780

30d MORTALITY

Global	**468**	**5 % (23/462)**
< 80y	409	4.2 % (17/404)
≥ 80 y	59	10.3 % (6/58)

30d MORTALITY

Global	**468**	**5% (23/462)**
No CKD	356	3,4 % (12/350)
CKD	112	9,8 % (11/112)

30d MORTALITY

Global	**468**	**5 % (23/462)**
ASA1	0	
ASA 2	25	4 % (1/25)
ASA 3	419	4.1 % (17/413)
ASA 4	24	20.8 % (5/24)

30d MORTALITY

Global	**468**	**5 % (23/462)**
Type I	11	9.1 % (1/11)
Type II	44	9.3 % (4/43)
Type III	166	5.6 % (9/162)
Type IV	138	3.6 % (5/137)
Type V	14	0 %
Juxta + Pararenals	95	4.2 % (4/95)

Spinal Cord Ischaemia

- 18 cases / 468 patients: 3.8 %

- No recovery: 11 (2.4 %)
- Partial recovery: 4 (0.9 %)
- Full recovery: 3 (0.6 %)

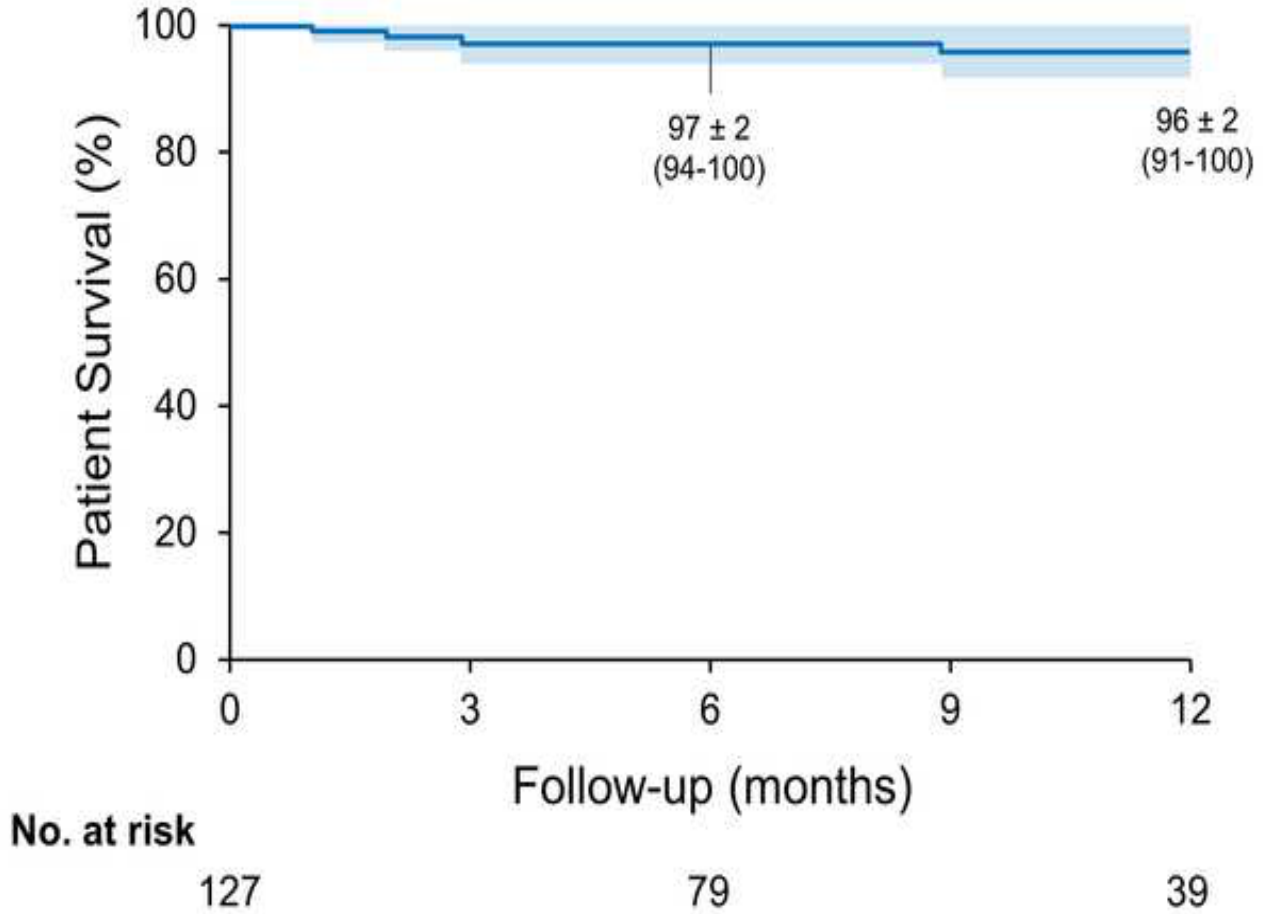
* 30d mortality associated with SCI: 22.2 % (4/18)

Target Vessels Occlusion
Mean FU: 37 months

TOTAL	**51/1363 (3.7 %)**
RRA	16/402 (4 %)
LRA	15/402 (3.7 %)
SMA	6/326 (1.8 %)
TC	12/212 (5.7 %)
Other fenestrations	2/21 (9.5 %)

Oderich et al, SVS 2016

Variable	**All** n = 127	**Pararenal** n = 47	**Type IV TAAA** n = 42	**Type I-III TAAA** n = 38	**P value**
	N and (Percent) or Mean ± Standard Deviation				
Any cause of mortality	0	0	0	0	1
Any major adverse event	27 (21)	10 (21)	9 (21)	8 (21)	1
Estimate blood loss higher than 1000 ml	10 (8)	1 (2)	2 (5)	7 (18)	0.014
Acute Kidney Injury (> 50% decrease in GFR)	12 (9)	4 (9)	6 (14)	2 (5)	0.37
New-Onset Dialysis	1 (1)	1 (2)	0	0	0.42
Myocardial Infarction	9 (7)	4 (9)	4 (10)	1 (3)	0.43
Respiratory failure	4 (3)	1 (2)	1 (2)	2 (5)	0.67
Paraplegia (SCI Grade 3a to 3c)	2 (2)	1 (2)	0	1 (3)	0.59
Stroke	4 (3)	1 (2)	2 (5)	1 (3)	0.76
Bowel ischemia requiring intensification of medical therapy	3 (2)	2 (4)	1 (2)	0	0.44
Postprocedure transfusion	37 (29)	7 (15)	10 (24)	20 (53)	<.001


100
80
60
40
20
0
Patient Survival (%)
97 ± 2
(94-100)
96 ± 2
(91-100)
0
3
6
9
12
Follow-up (months)
No. at risk
127
79
39

Outcomes / Patient's Selection

- ASA score
- Age > 80y
- CKD
- Crawford Extension
- SCI

Thomas L. Forbes, MD, and Jean-Baptiste Ricco, MD, PhD, Section Editors

Debate: Whether fenestrated endografts should be limited to a small number of specialized centers

Stéphan Haulon, MD, PhD,[a] David Barillà, MD,[a] Mark Tyrrell, MD,[b] Nikolaos Tsilimparis, MD,[c] and Joseph J. Ricotta II, MD, MS,[c] *Lille, France; London, United Kingdom; and Atlanta, Ga*

Until fairly recently, experience with advanced endovascular technologies, including fenestrated endovascular repair (FEVAR), has been limited to a relatively small number of practitioners worldwide. Excellent outcomes have been achieved by these accomplished surgeons who, at least initially, have primarily used custom-made devices constructed by a single endograft manufacturer. Access to this technology has been limited by the skills necessary for such procedures and by the customization process with industry partners. However, several issues are changing rapidly with FEVAR. Increasing numbers of surgeons now have the necessary endovascular skills, and off-the-shelf endografts from several manufacturers have become, or are becoming, available. Also, the regulatory landscape is changing with device approval in the United States. Surgeons and patients alike are anticipating the widespread adoption of this advanced technology that will surely benefit increasing numbers of patients. Or will it? Will widespread adoption in a larger number of smaller-volume hospitals, by less experienced surgeons, result in poor patient outcomes, or will excellent results continue with more patients benefitting from these technologic advances? These are important questions to ask before such adoption and are the subject of this debate. (J Vasc Surg 2013;57:875-83.)

Eur J Vasc Endovasc Surg (2015) 49, 248–254

Editor's Choice – The Impact of Early Pelvic and Lower Limb Reperfusion and Attentive Peri-operative Management on the Incidence of Spinal Cord Ischemia During Thoracoabdominal Aortic Aneurysm Endovascular Repair

B. Maurel [a], N. Delclaux [a], J. Sobocinski [a], A. Hertault [a], T. Martin-Gonzalez [a], M. Moussa [a], R. Spear [a], M. Le Roux [a], R. Azzaoui [a], M. Tyrrell [b], S. Haulon [a,*]

[a] Aortic Centre, Hôpital Cardiologique, CHRU de Lille, INSERM U1008, Université Lille Nord de France, 59037 Lille Cedex, France
[b] King's Health Partners, London, UK

WHAT THIS PAPER ADDS

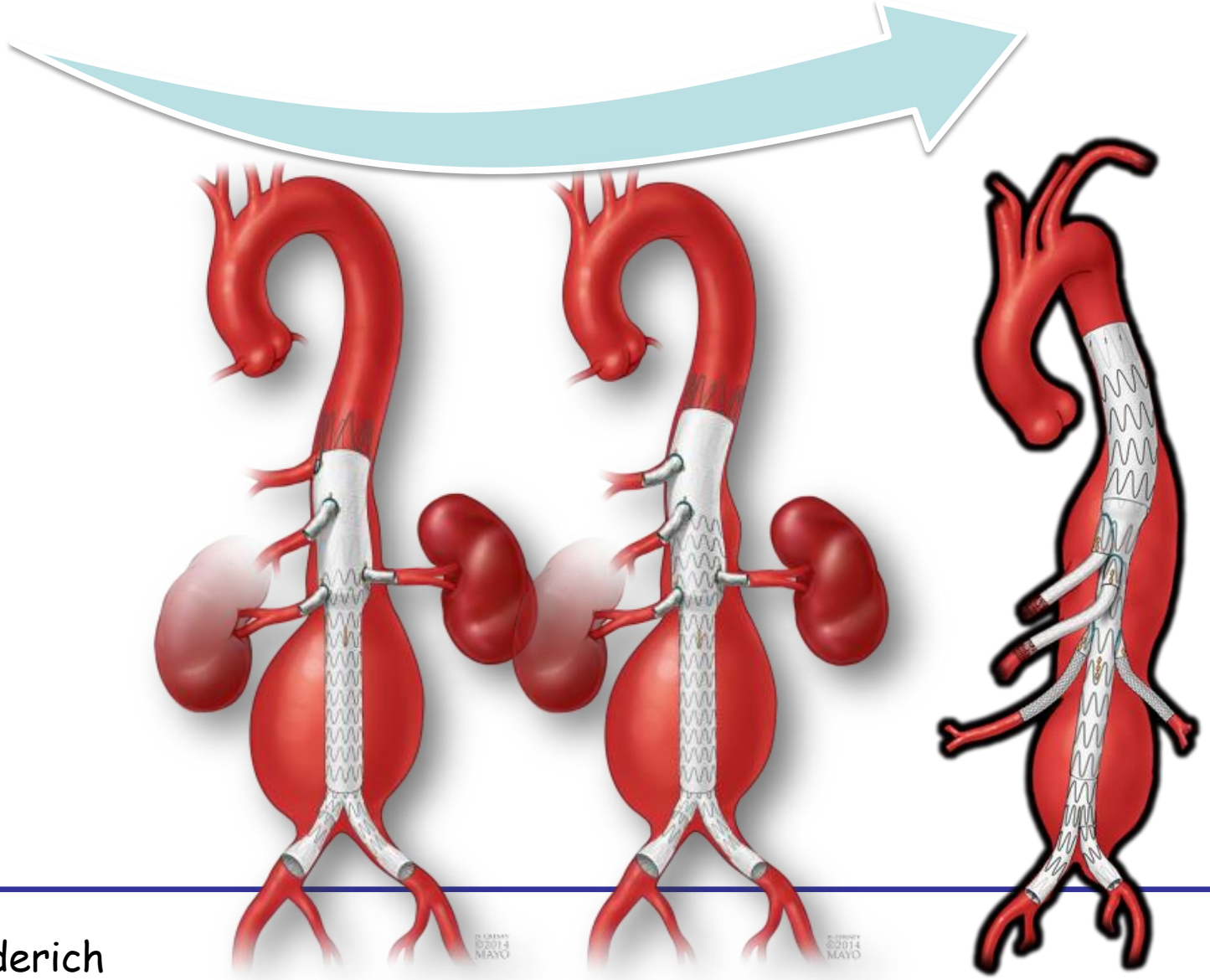
This paper reports the impact of an optimized spinal cord protection strategy on spinal cord ischemia rates after endovascular thoracoabdominal aneurysm repair performed in a high volume center.

Learning Curve / RESULTS

- In-hospital mortality: 11.6 % in group 1 vs 5.6 % in group 2 (RR = 0.481 [0.17-1.36]; p = 0.09)

- Spinal Cord Ischemia: 14% vs 1.2% (RR = 1.148 [1.016-1.296]; p < 0.001)

INCREASED COMPLEXITY



Courtesy G. Oderich

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GE Discovery IGS 730

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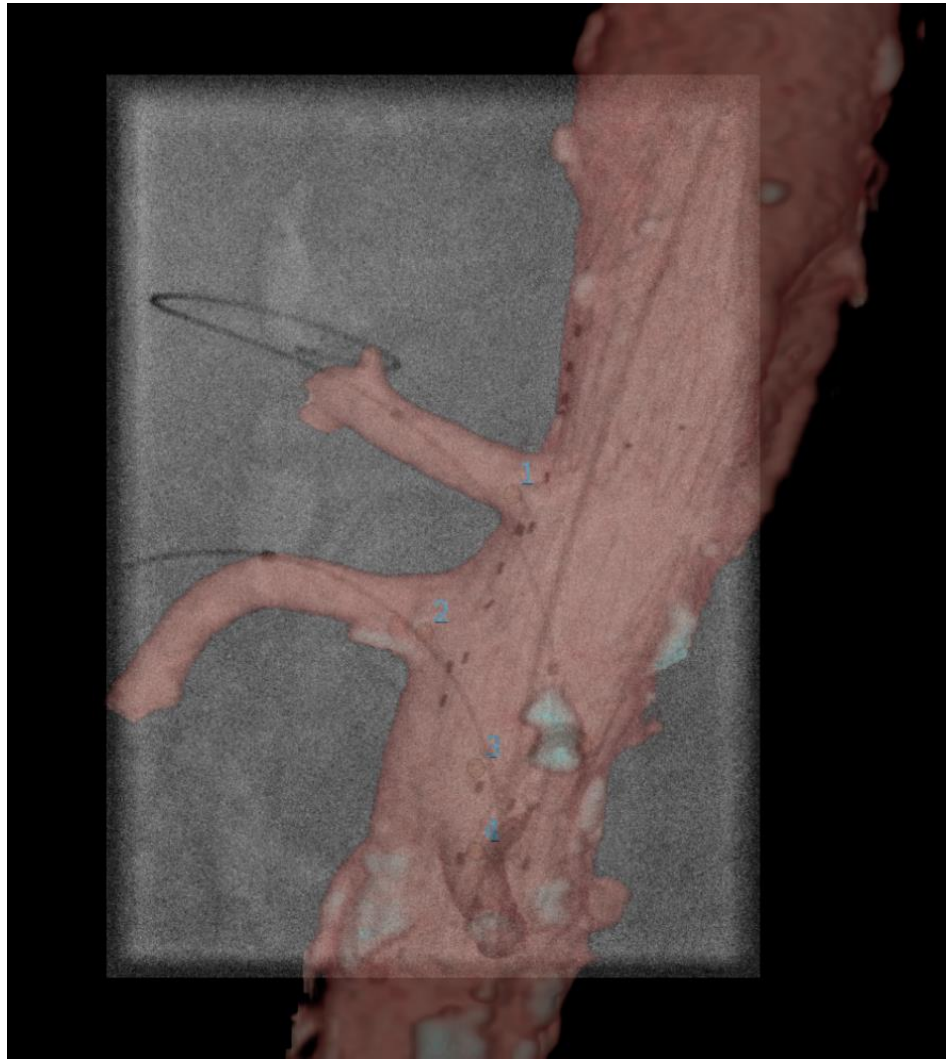

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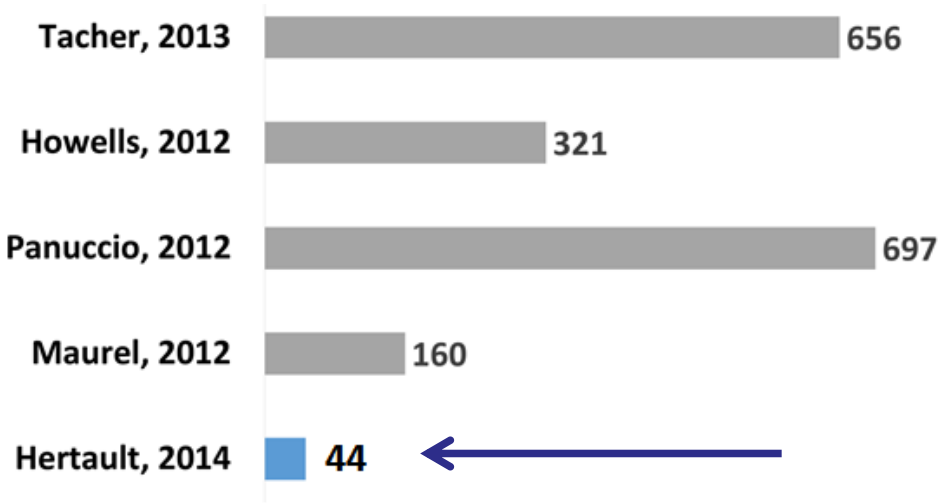
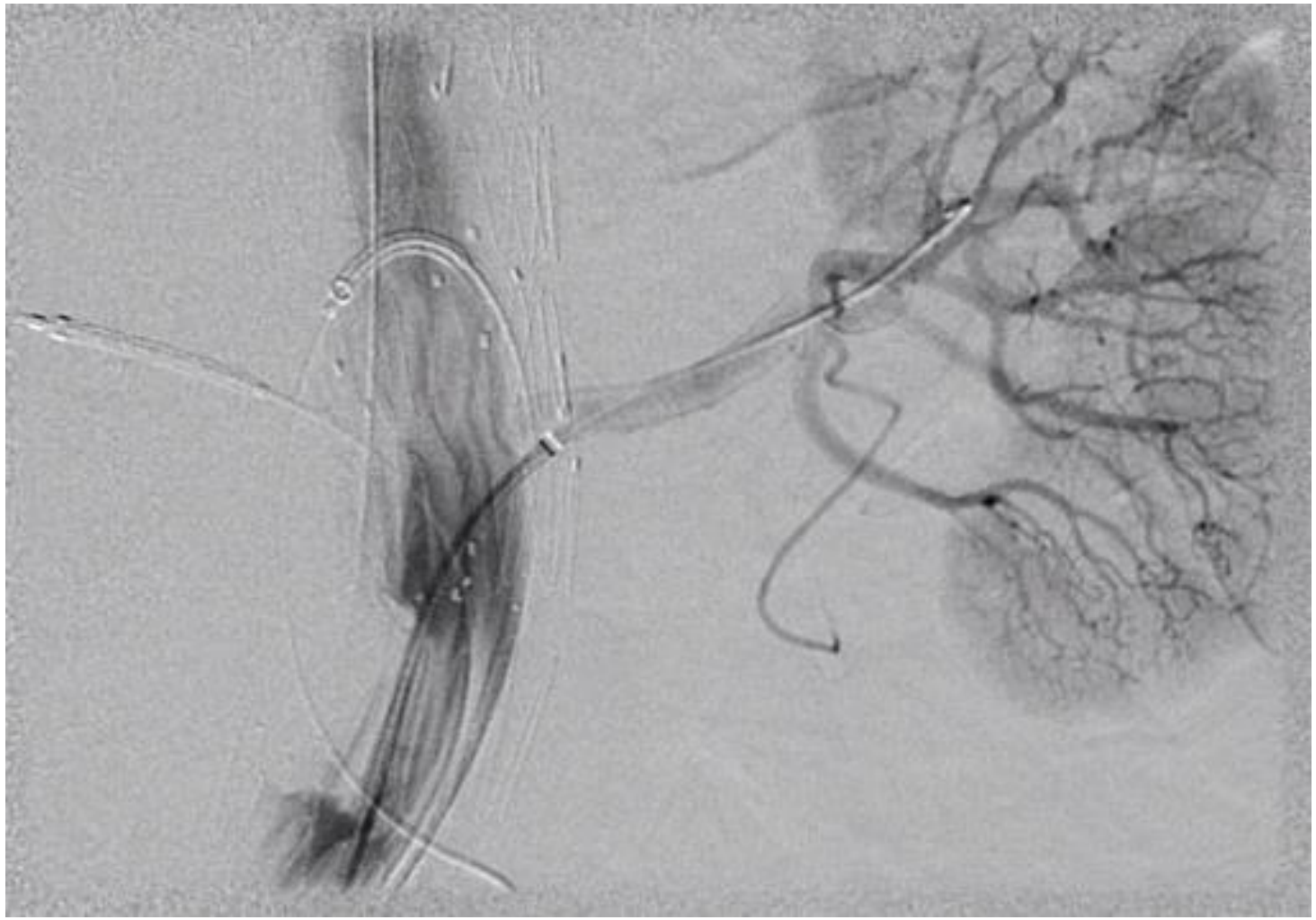
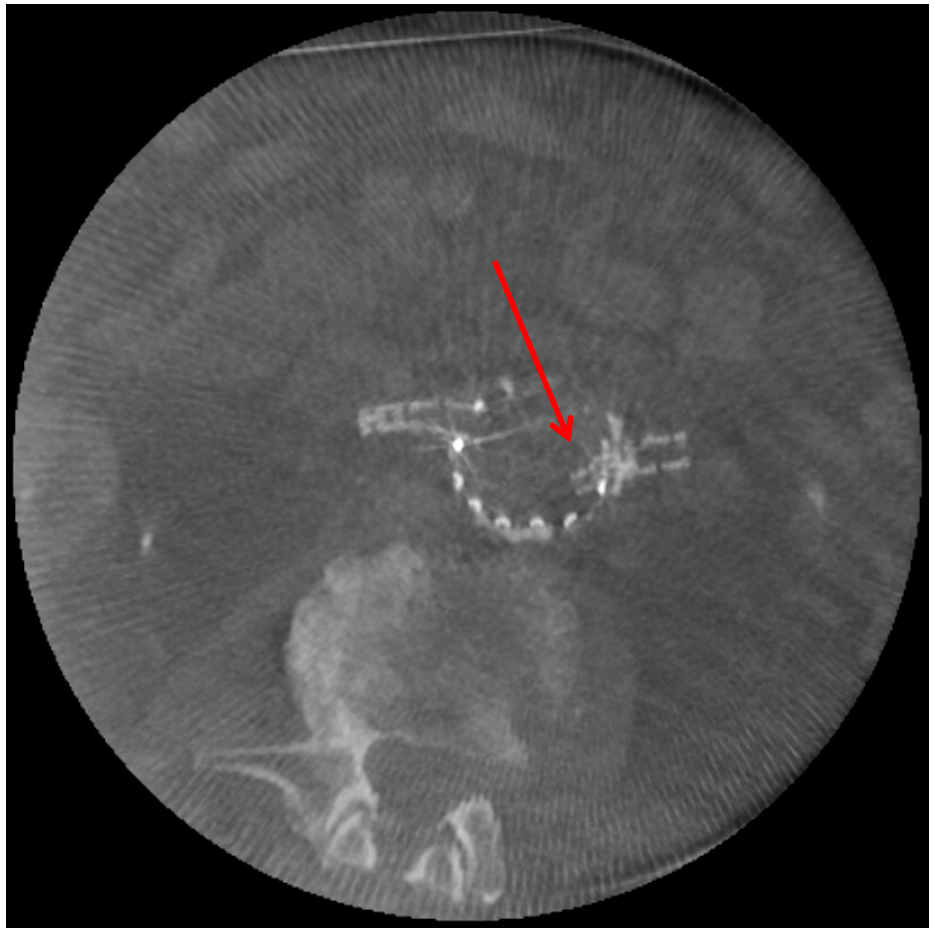
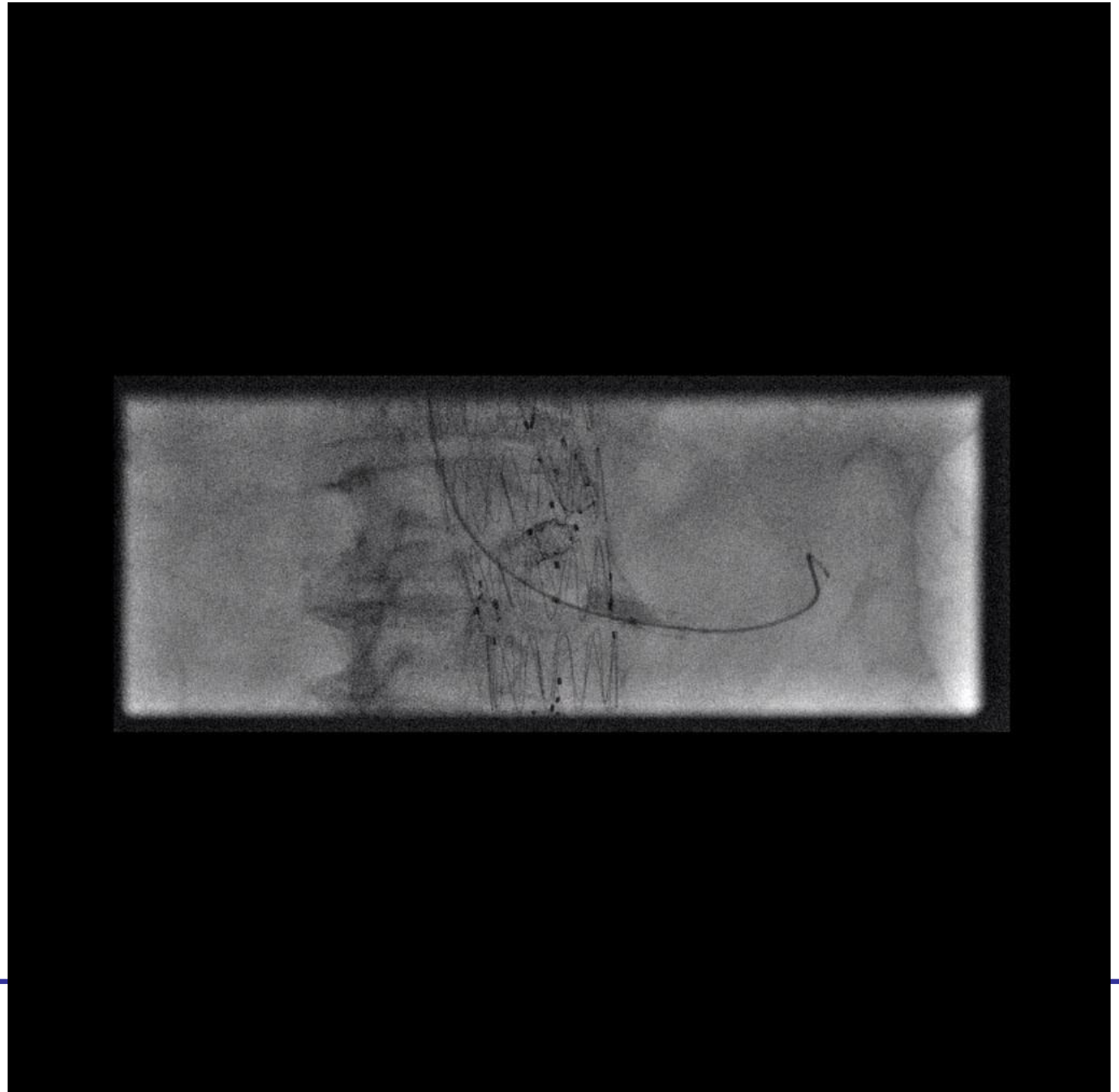
Literature overview
Where do we stand?

Median DAP (Gy.cm²) values reported in the Literature for complex EVAR procedures

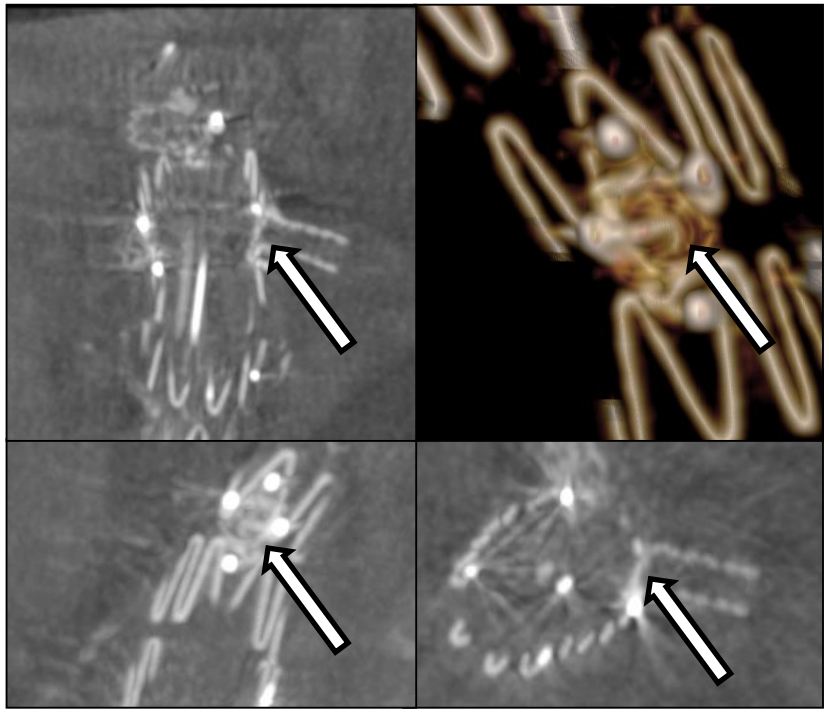


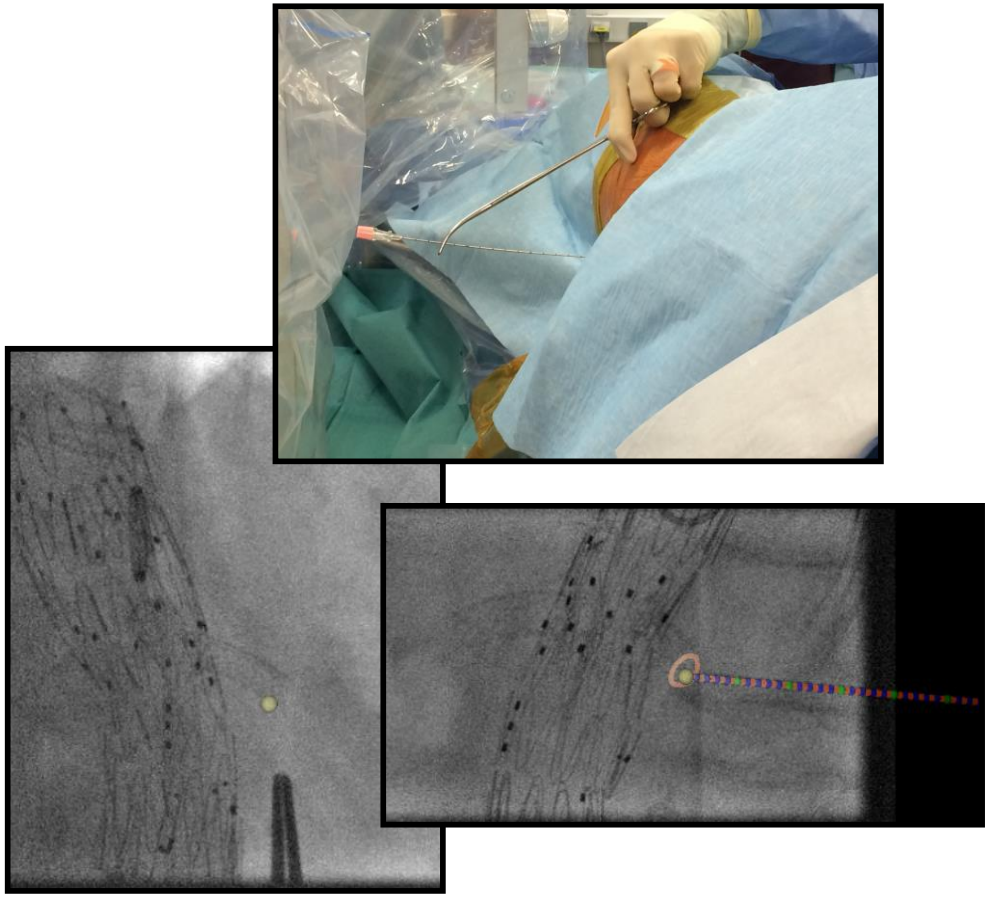




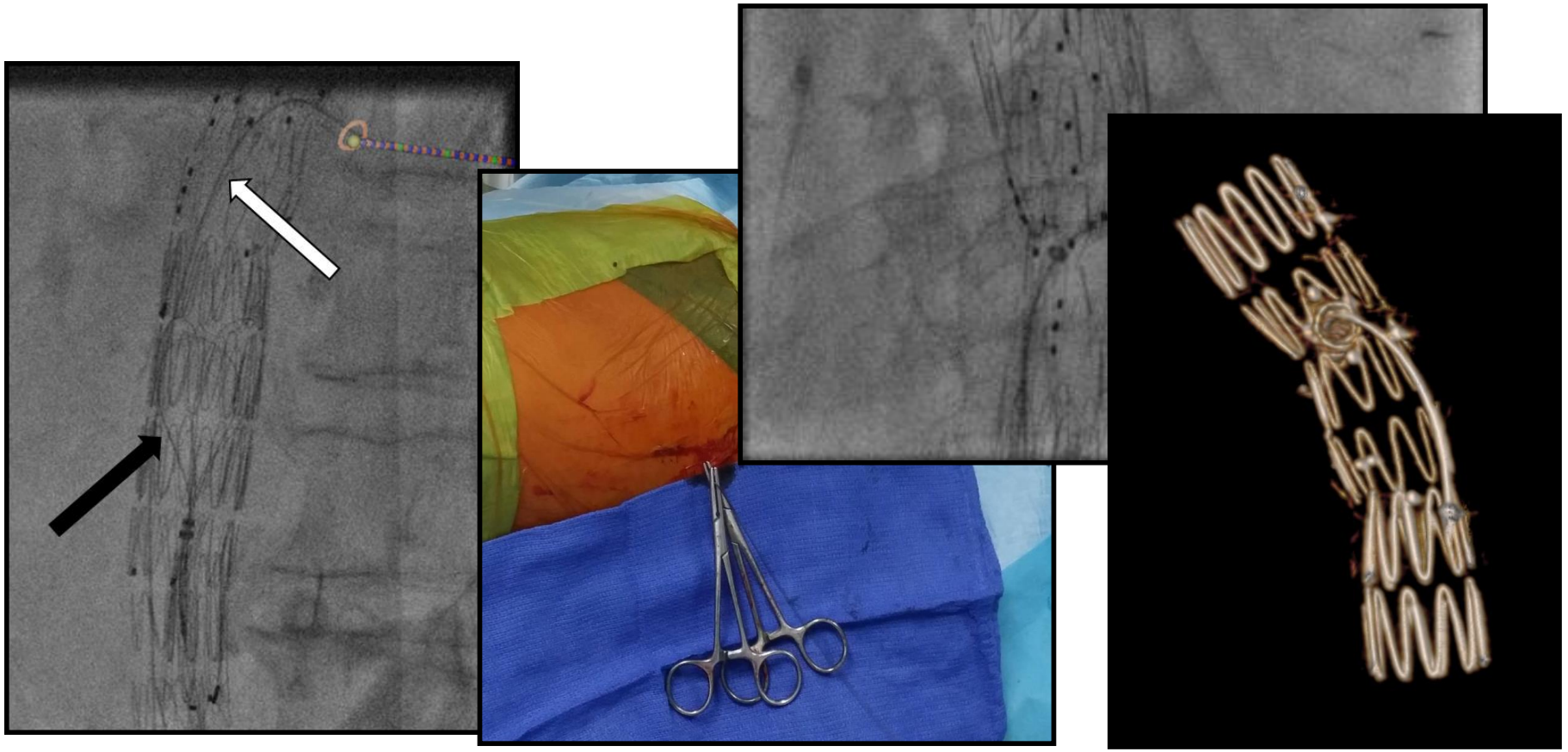


TrackVision Needle Guidance





TrackVision Needle Guidance



Case Report

JOURNAL OF ENDOVASCULAR THERAPY
A SAGE Publication
An official publication of the International Society of Endovascular Specialists

Journal of Endovascular Therapy
1–6

DOI: 10.1177/1526602816664769
www.jevt.org
SAGE

Translumbar Puncture for Retrograde Catheterization of a Kinked Left Renal Stent After Fenestrated Endograft Repair

Adrien Hertault, MD[1], Rachel E. Clough, MD, PhD[1], Teresa Martin-Gonzalez, MD, PhD[1], Rafaelle Spear, MD, PhD[1], Richard Azzaoui, MD[1], Jonathan Sobocinski, MD, PhD[1], and Stéphan Haulon, MD, PhD[1]

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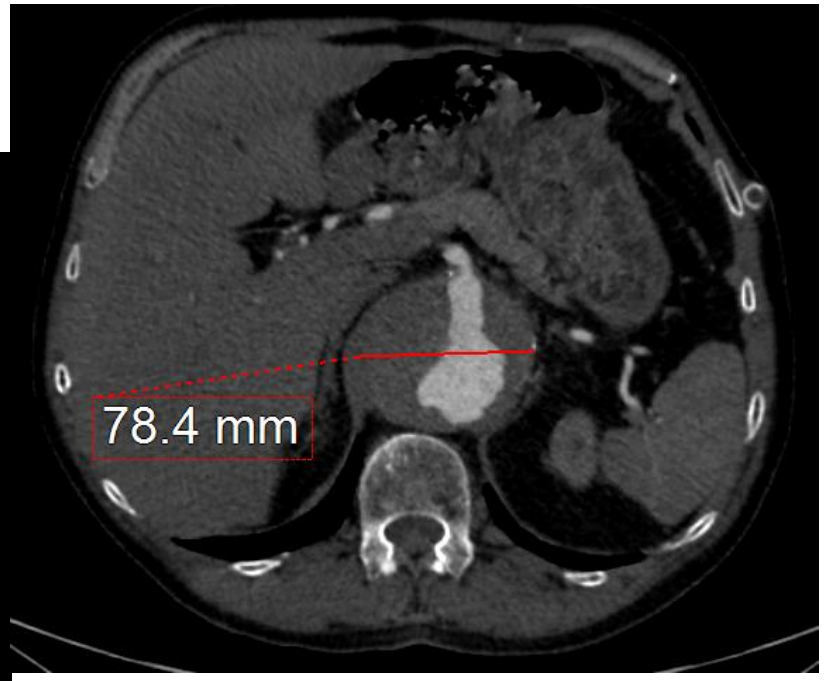
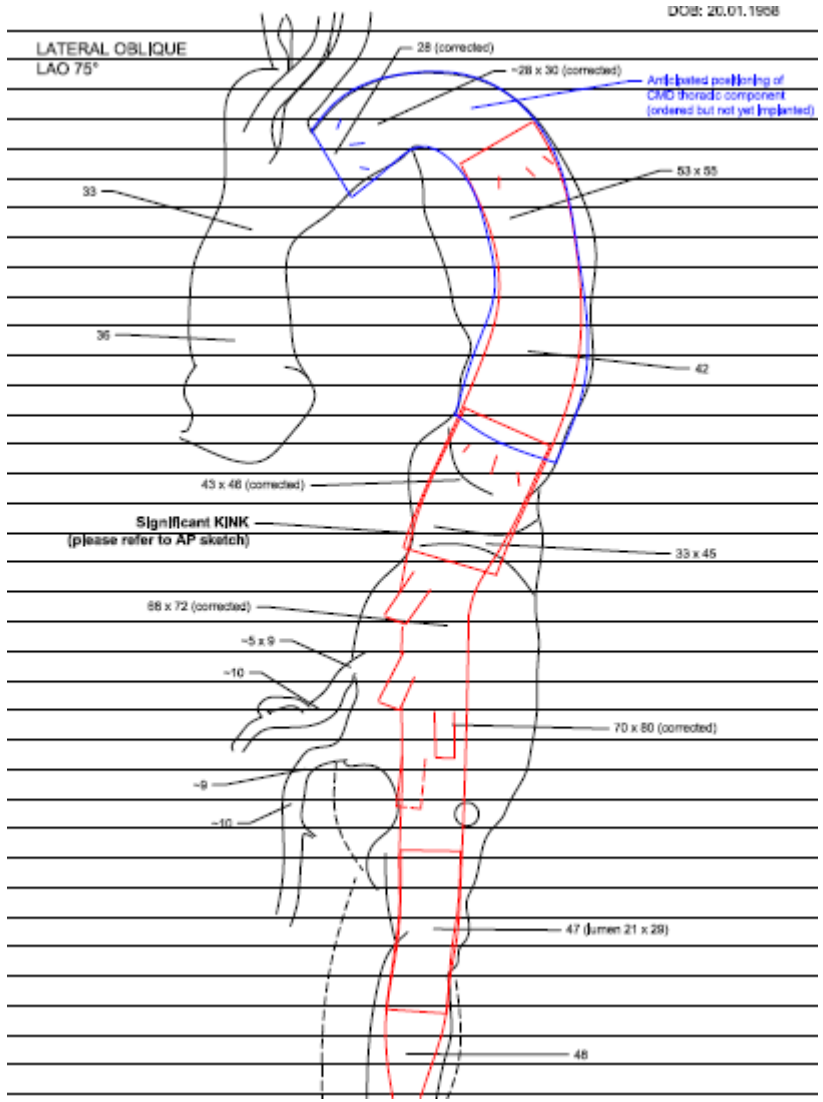
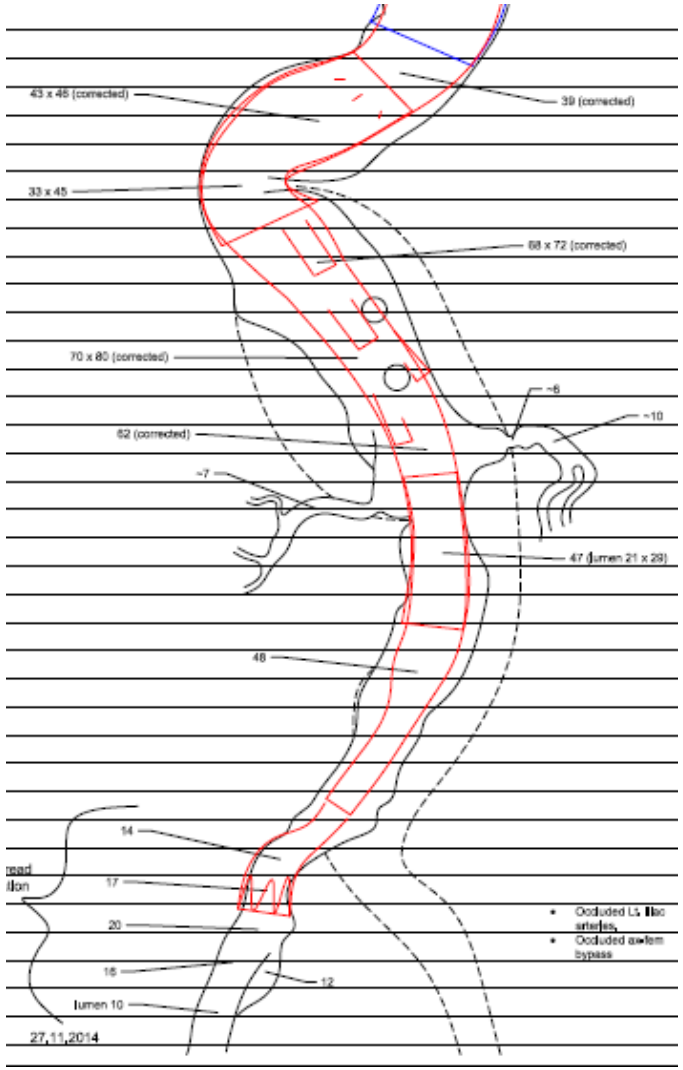
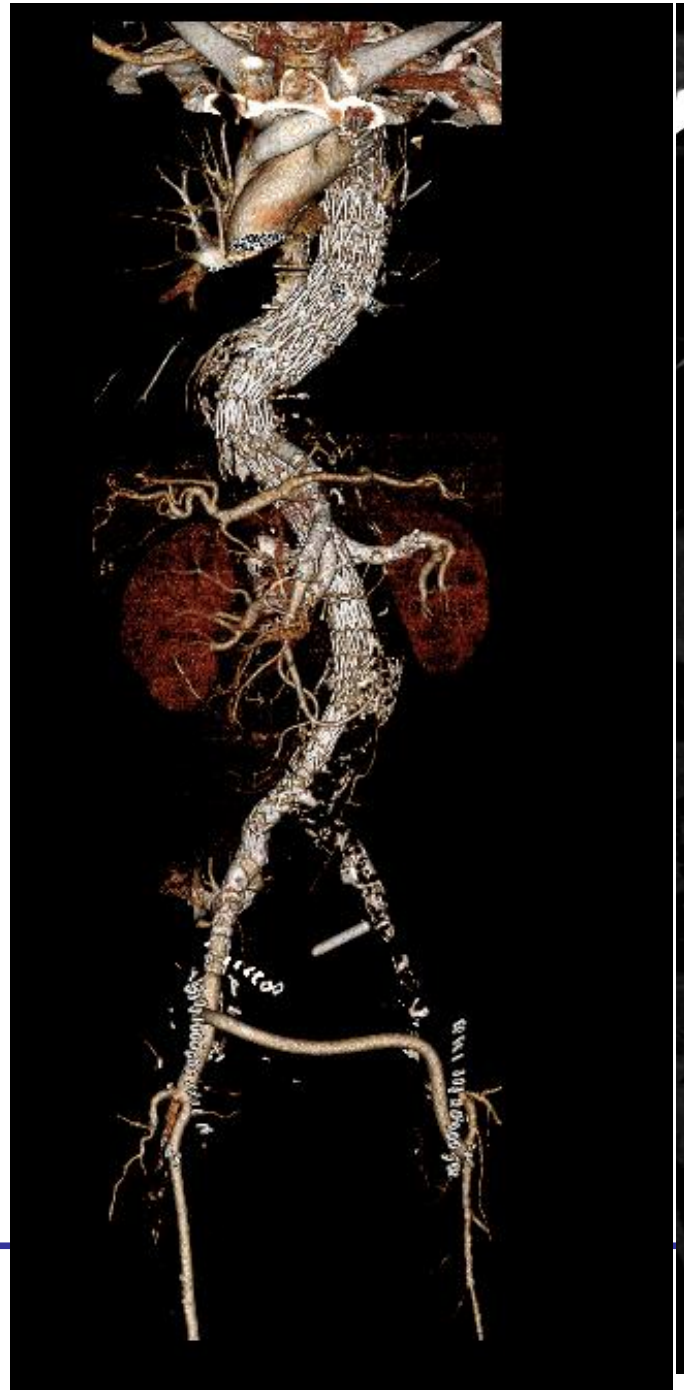
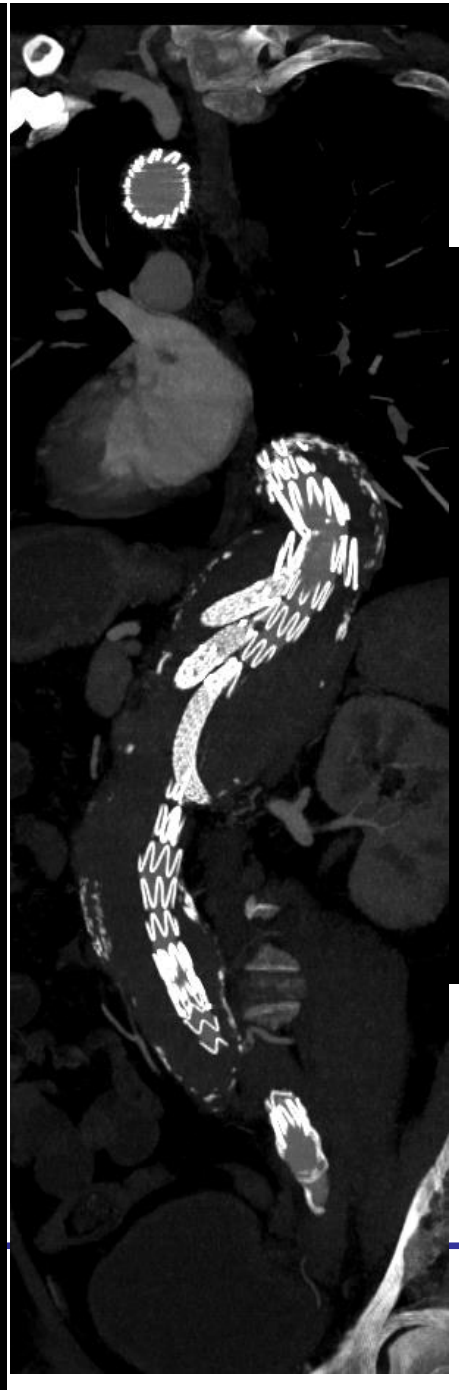

78.4 mm


DOB: 20.01.1958
LATERAL OBLIQUE
LAO 75°
28 (corrected)
~28 x 30 (corrected)
Anticipated positioning of
CMD thoracic component
(ordered but not yet implanted)
53 x 55
33
36
42
43 x 48 (corrected)
Significant KINK
(please refer to AP sketch)
33 x 45
68 x 72 (corrected)
~5 x 9
~10
70 x 80 (corrected)
~9
~10
47 (lumen 21 x 28)
48


43 x 48 (corrected)
39 (corrected)
33 x 45
68 x 72 (corrected)
70 x 80 (corrected)
~6
~10
62 (corrected)
~7
47 (lumen 21 x 28)
48
14
17
20
16
12
lumen 10
27.11.2014


CHRU LILLE Hal Cardiologique
12250808
M Apr 14 1954
Scopie
Jan 22 2013
11:07:01
(Filt. 1)
FOV: 30x30 cm
RAO: 0.8 deg
CAU: 0.5 deg
L: 44.9 deg
Tilt: 0 deg
Mag = 1.00
FL: ROT:
WW: 256 WL: 128
XA 512x512
Seq: 15
FRAME =108 / 149





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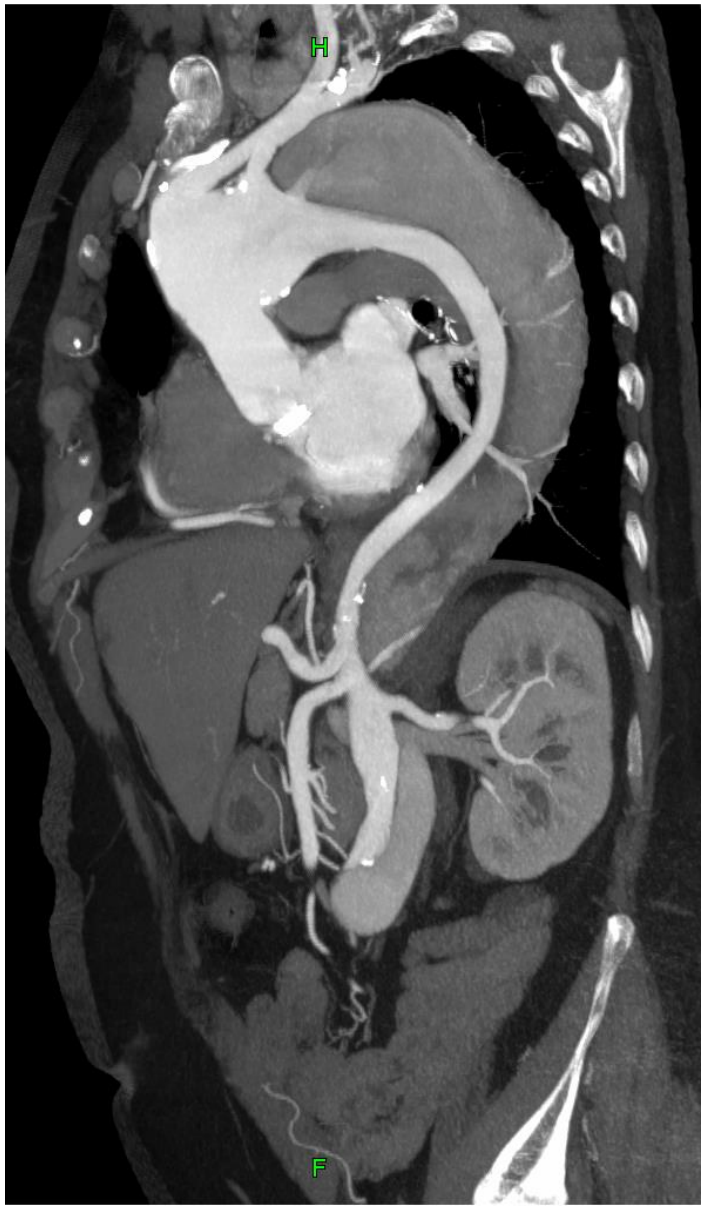
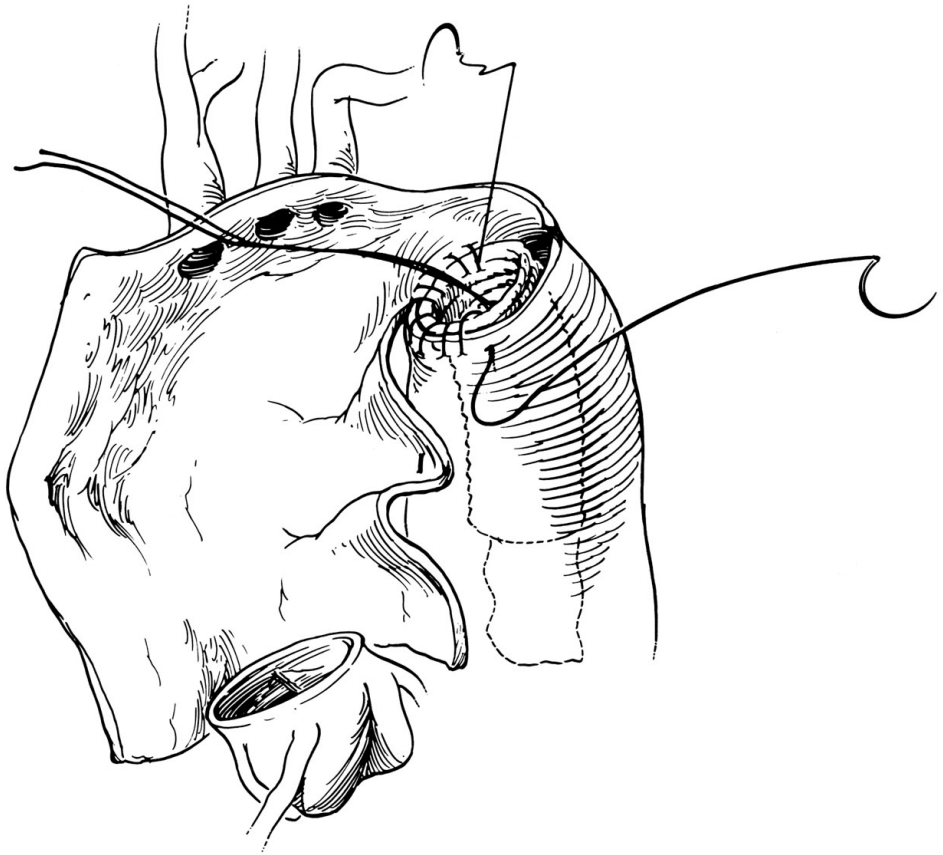
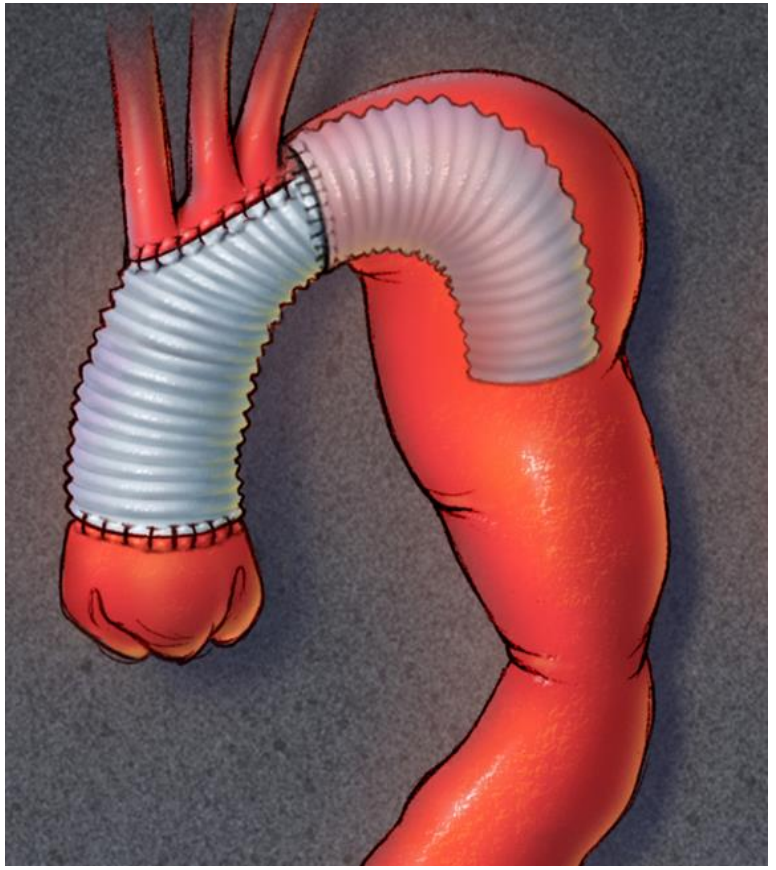
Challenging Anatomies

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

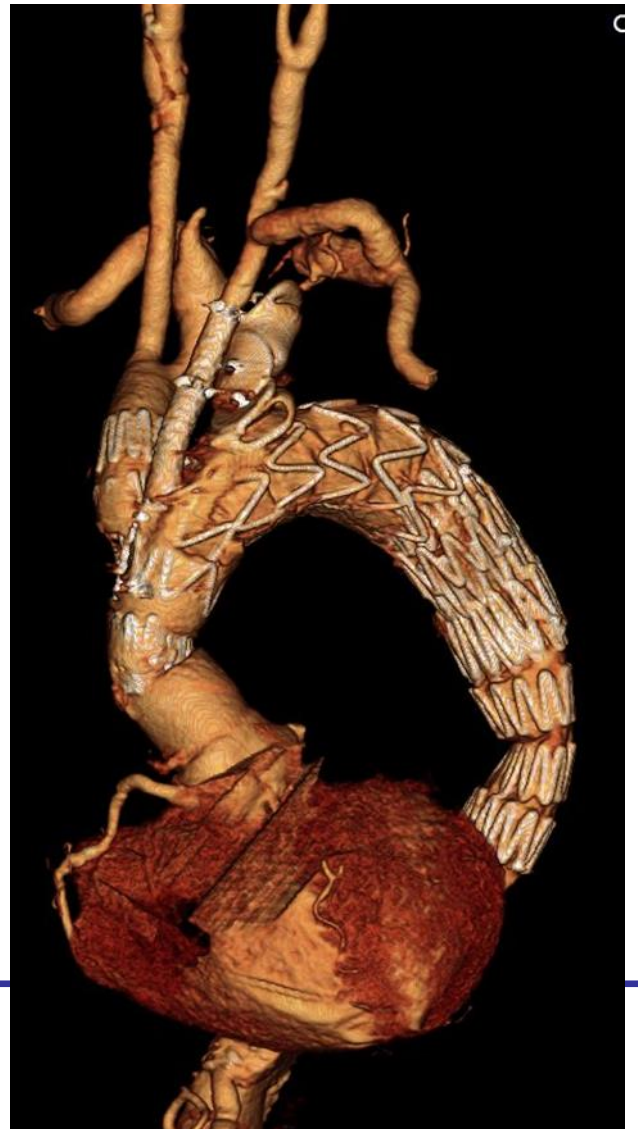


No Compromise on Proximal Seal - Open Surgery





Post Type A Repair
Branched Arch Endograft



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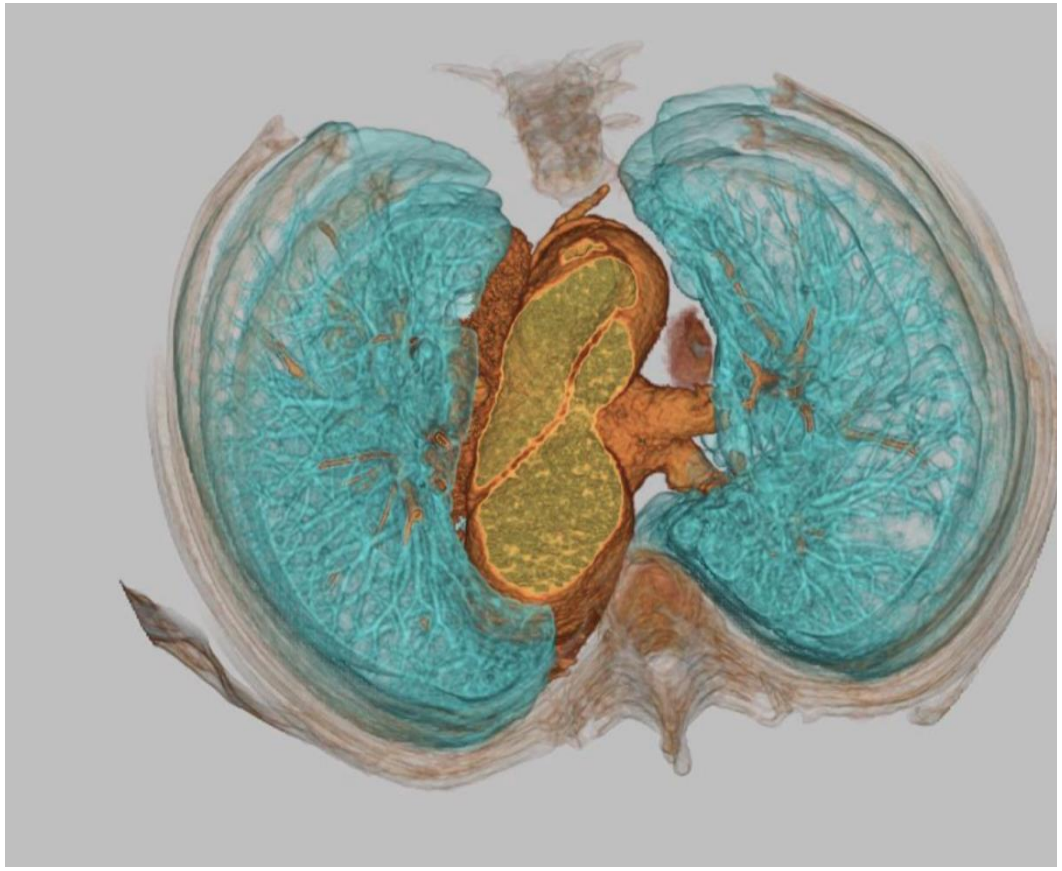

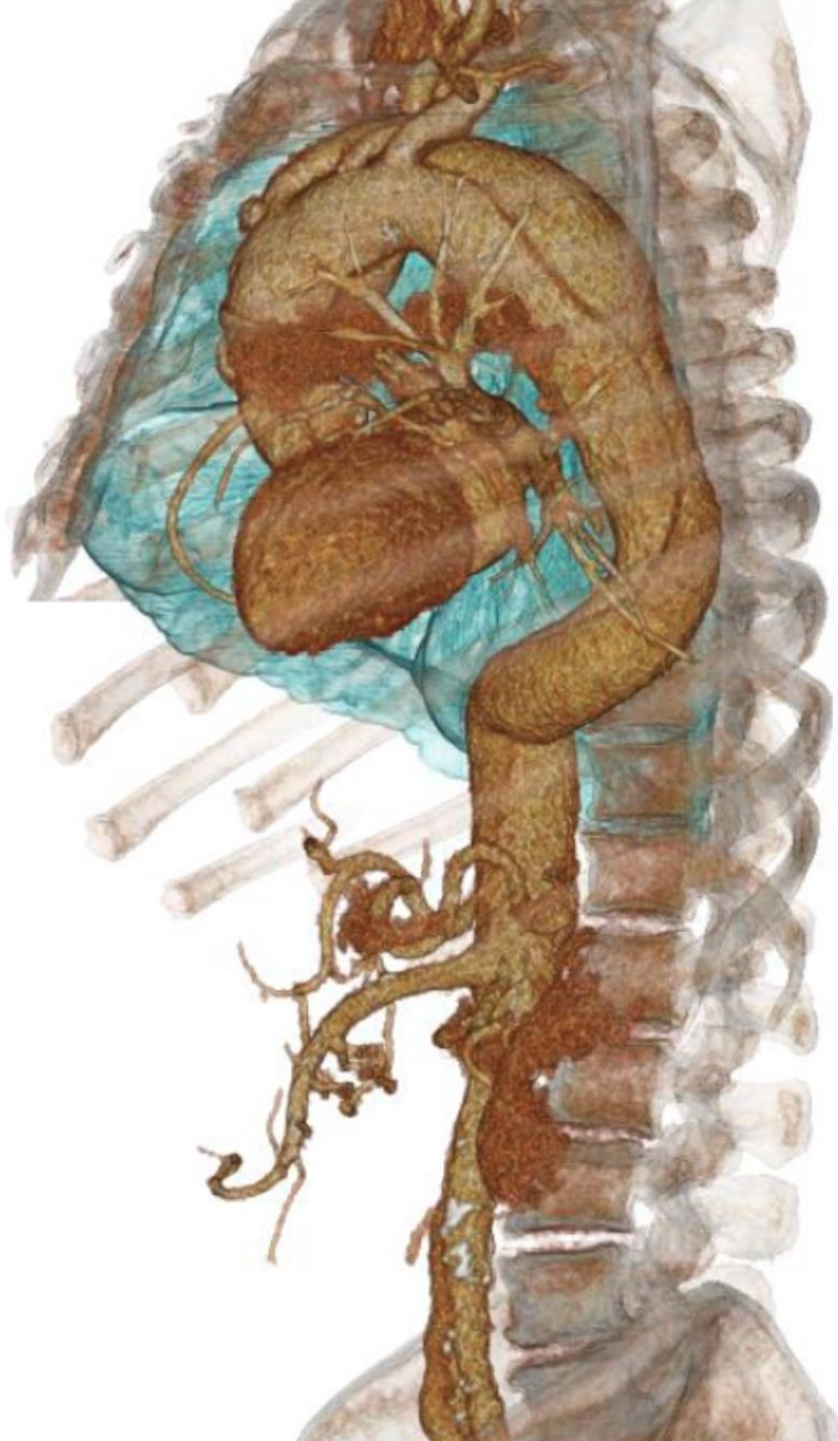

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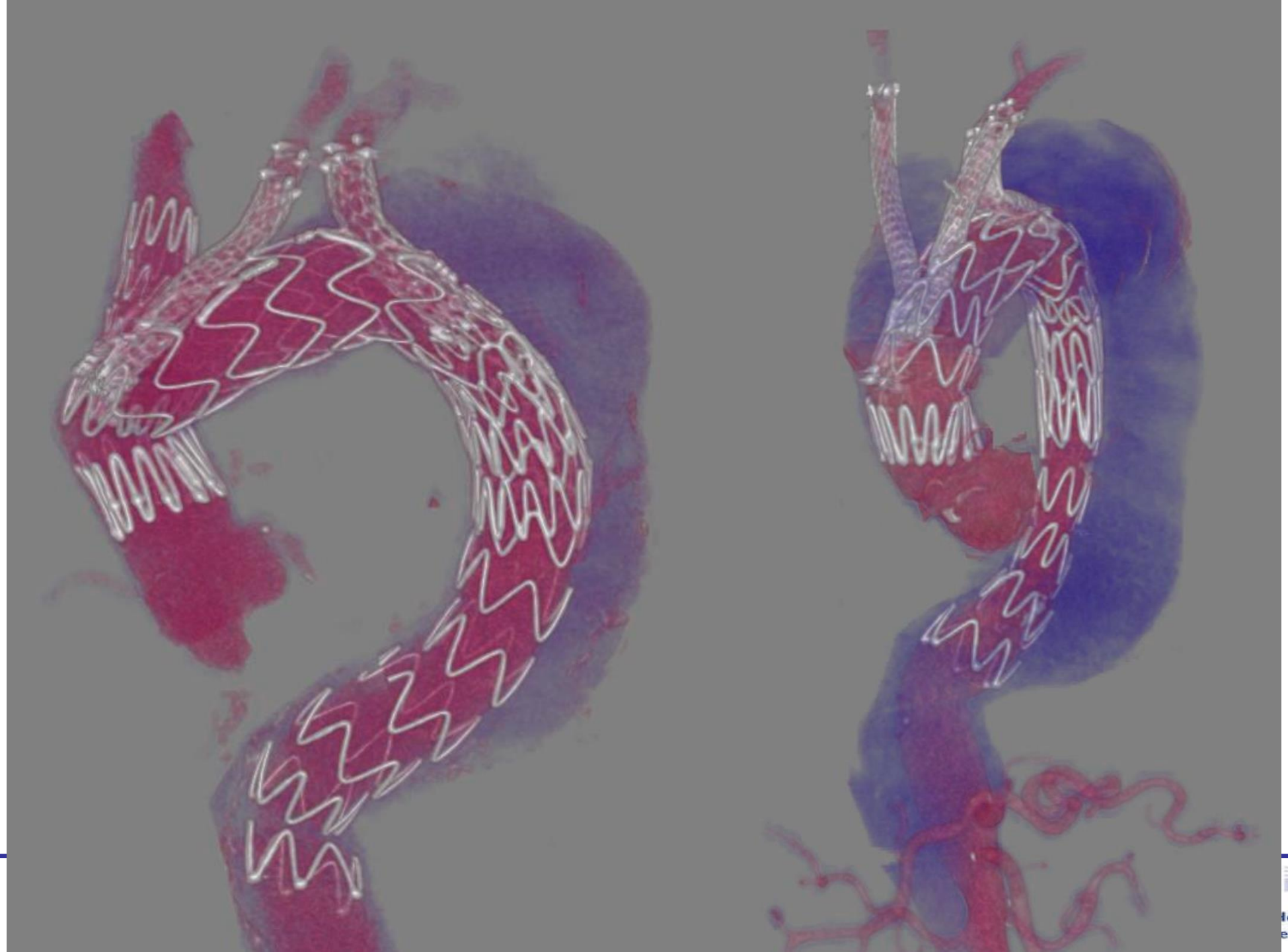
A
B
C



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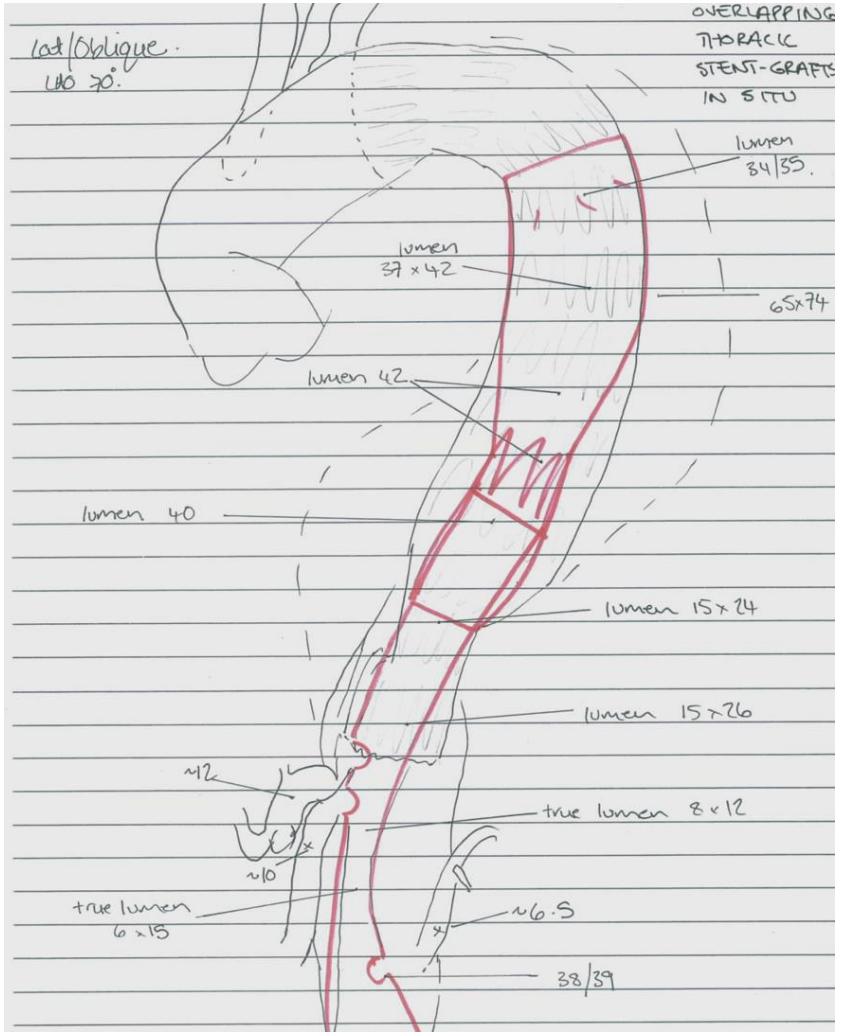
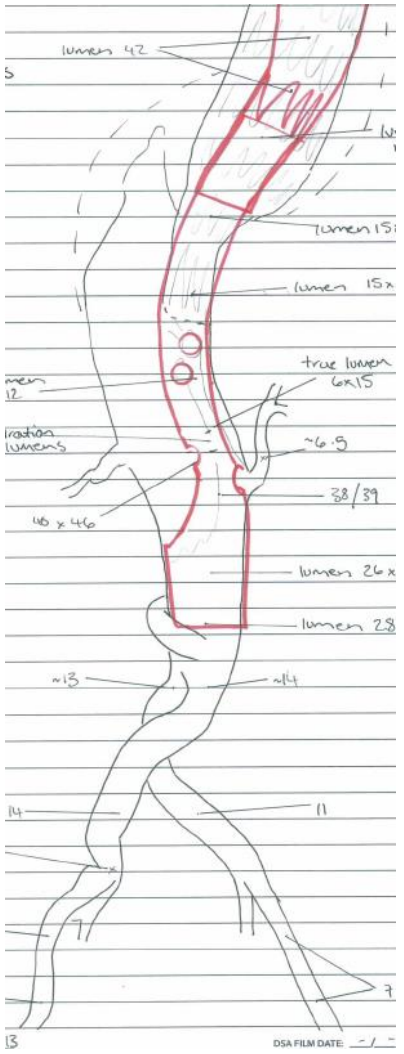
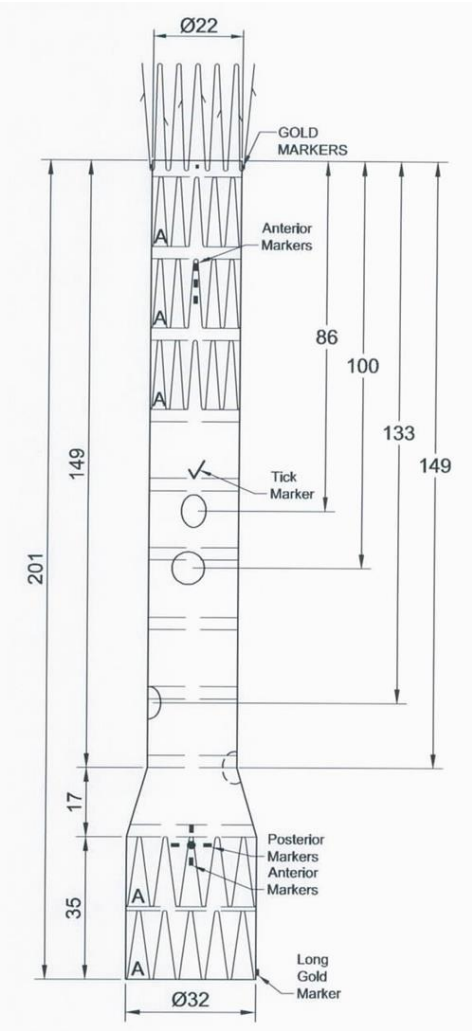
Staged Approach







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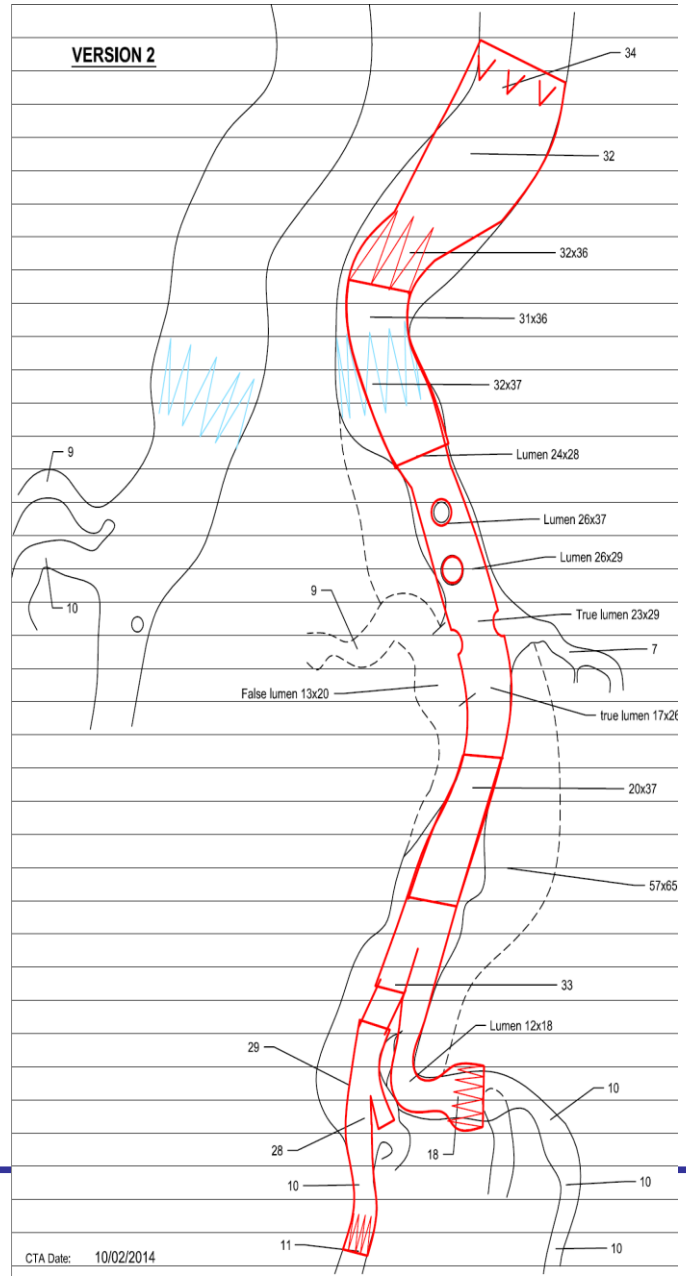
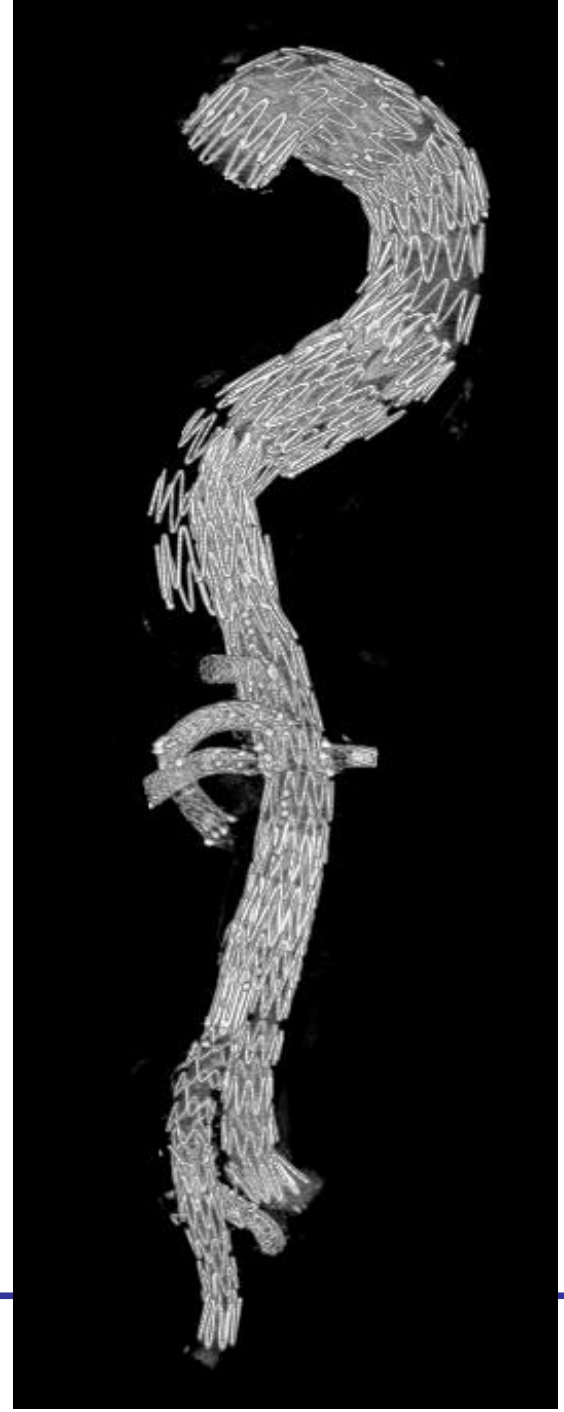
TERARECON





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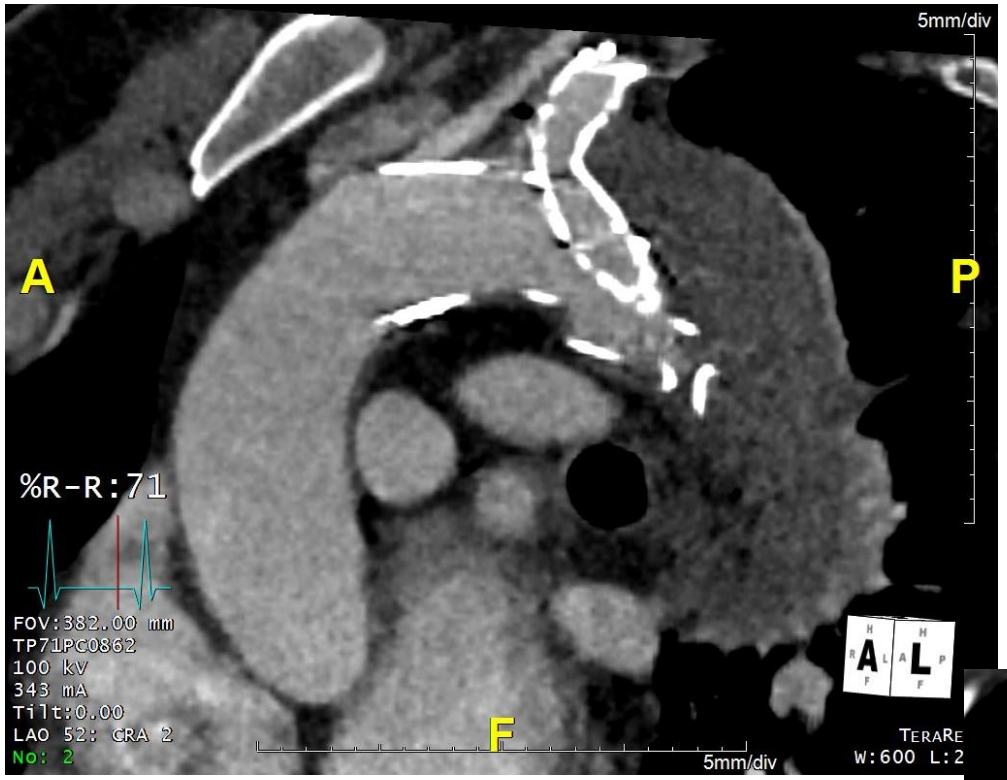

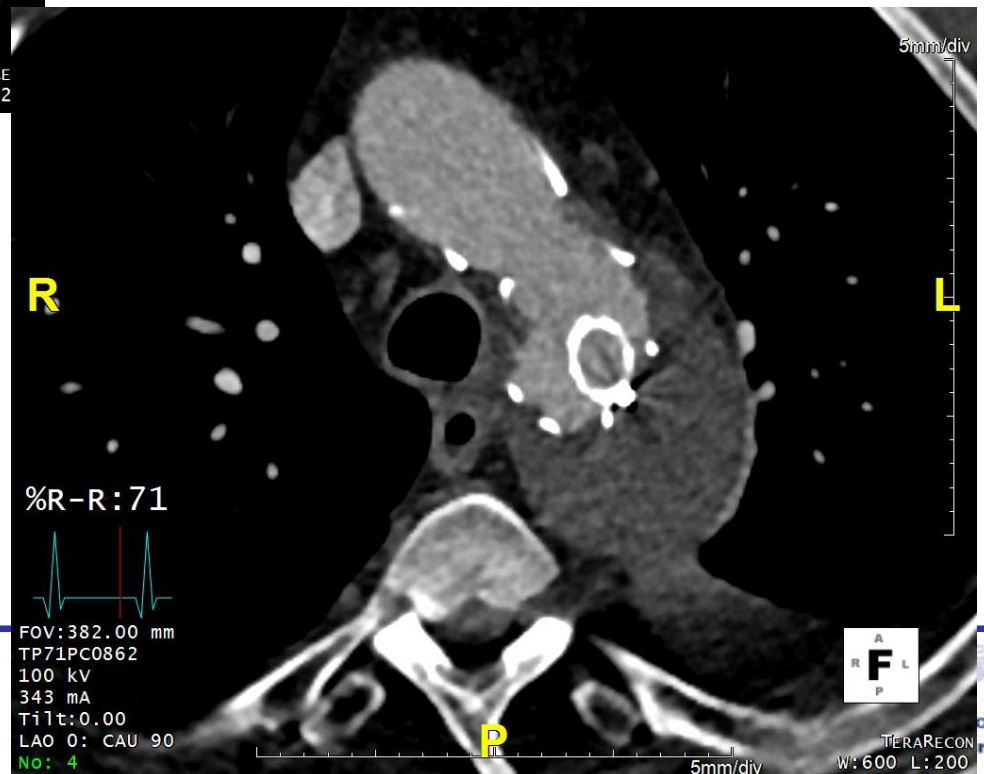

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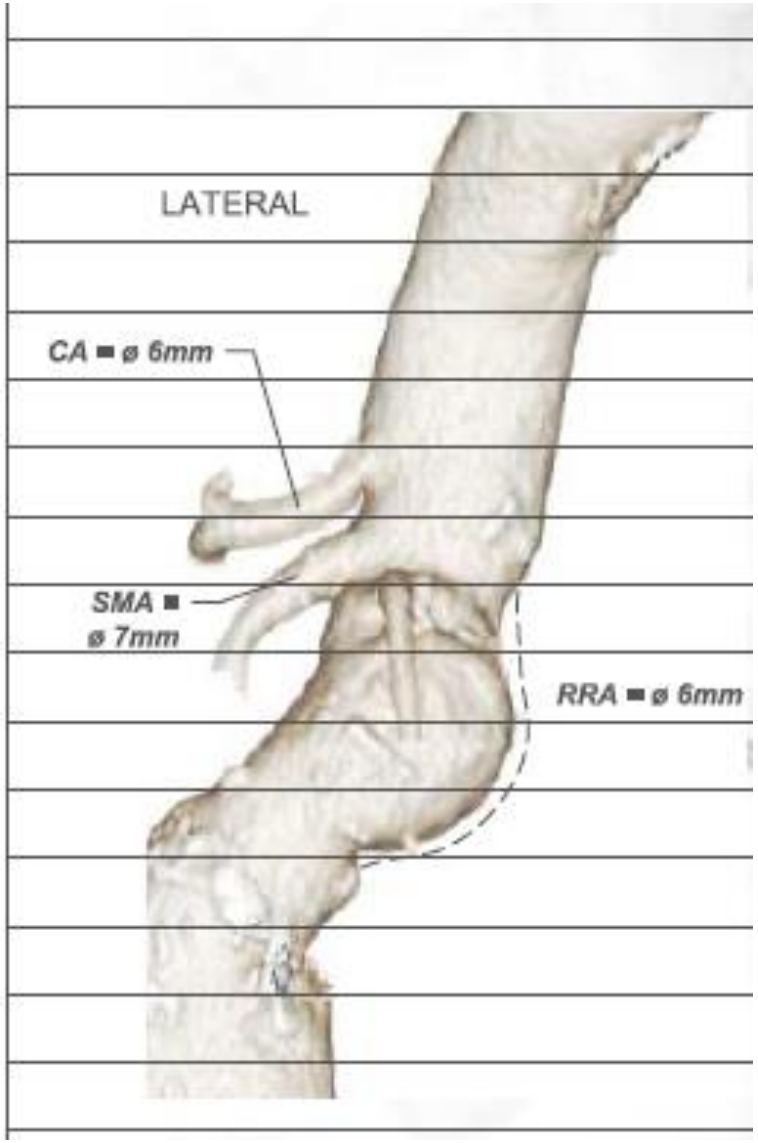

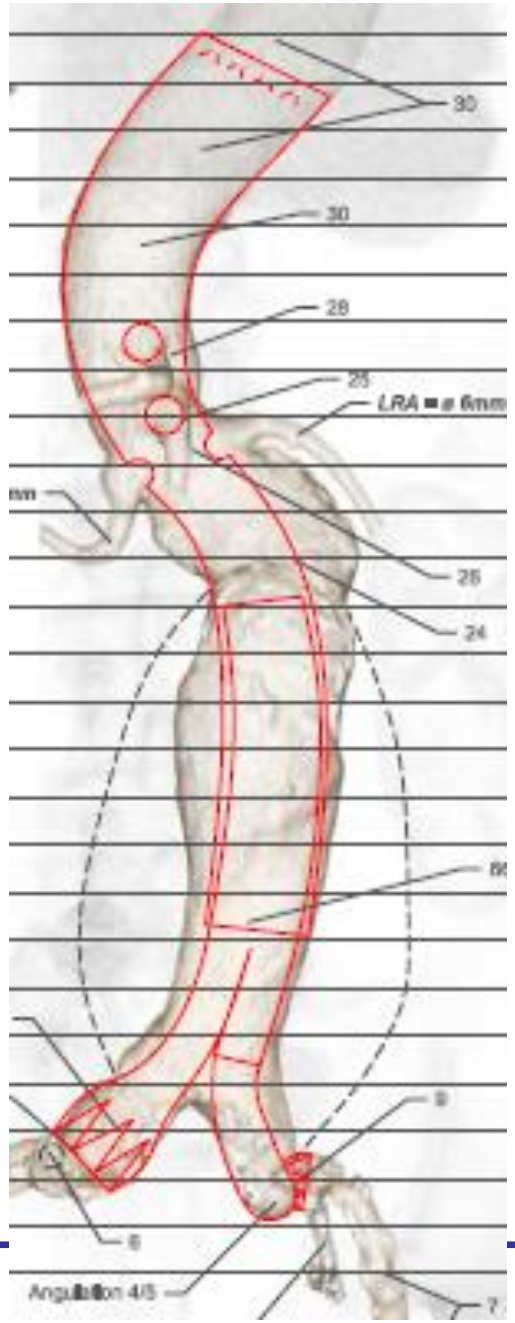

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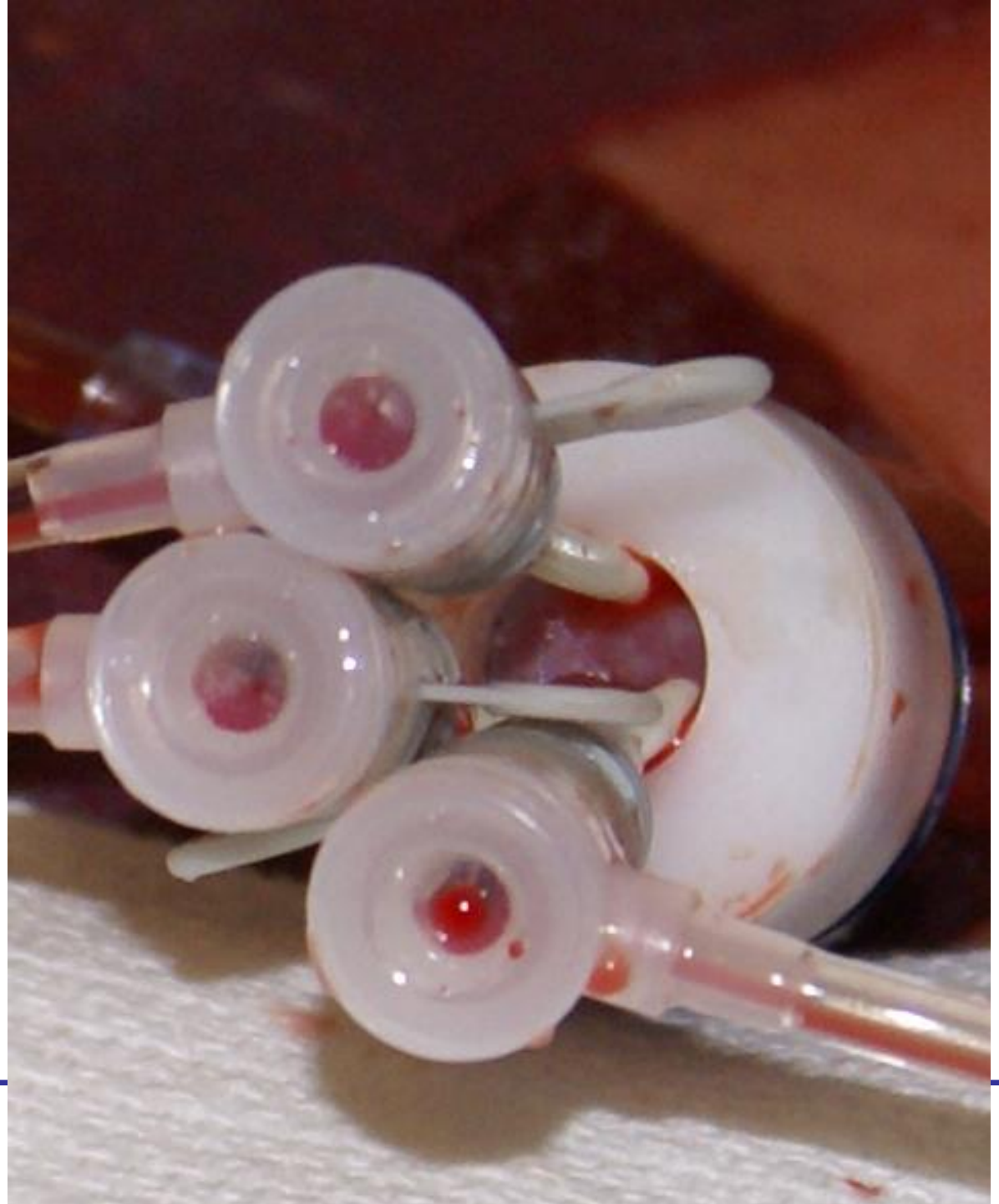

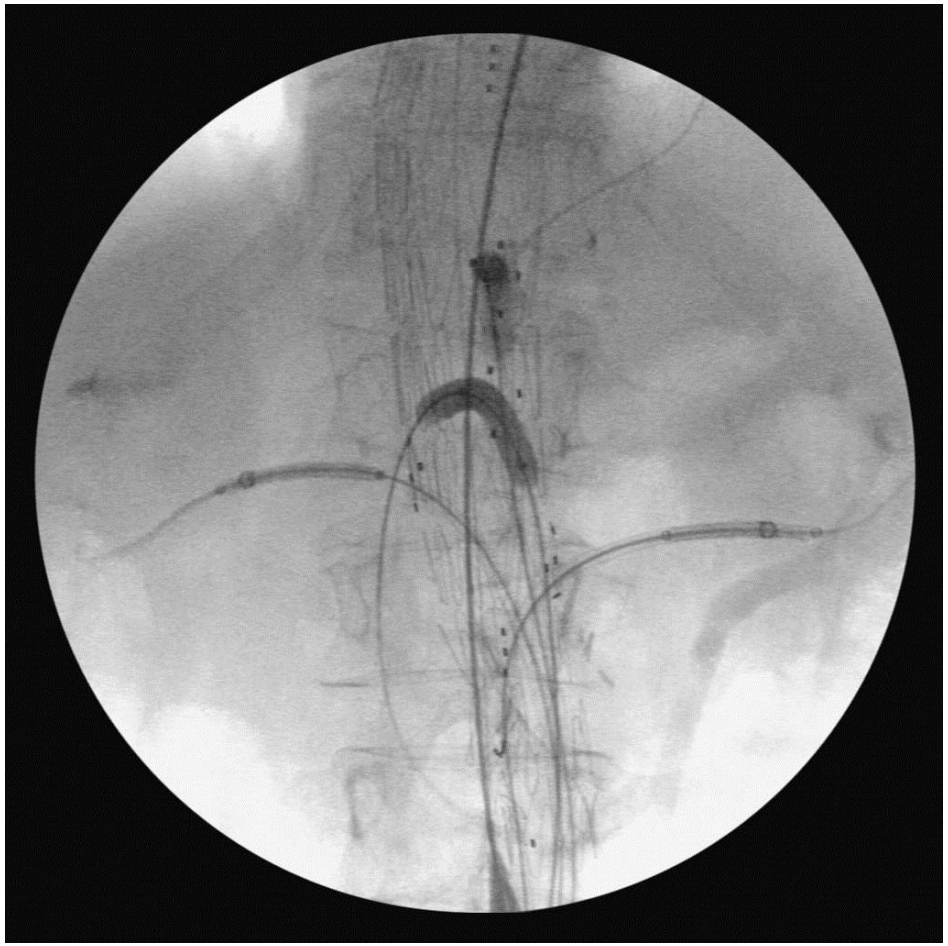


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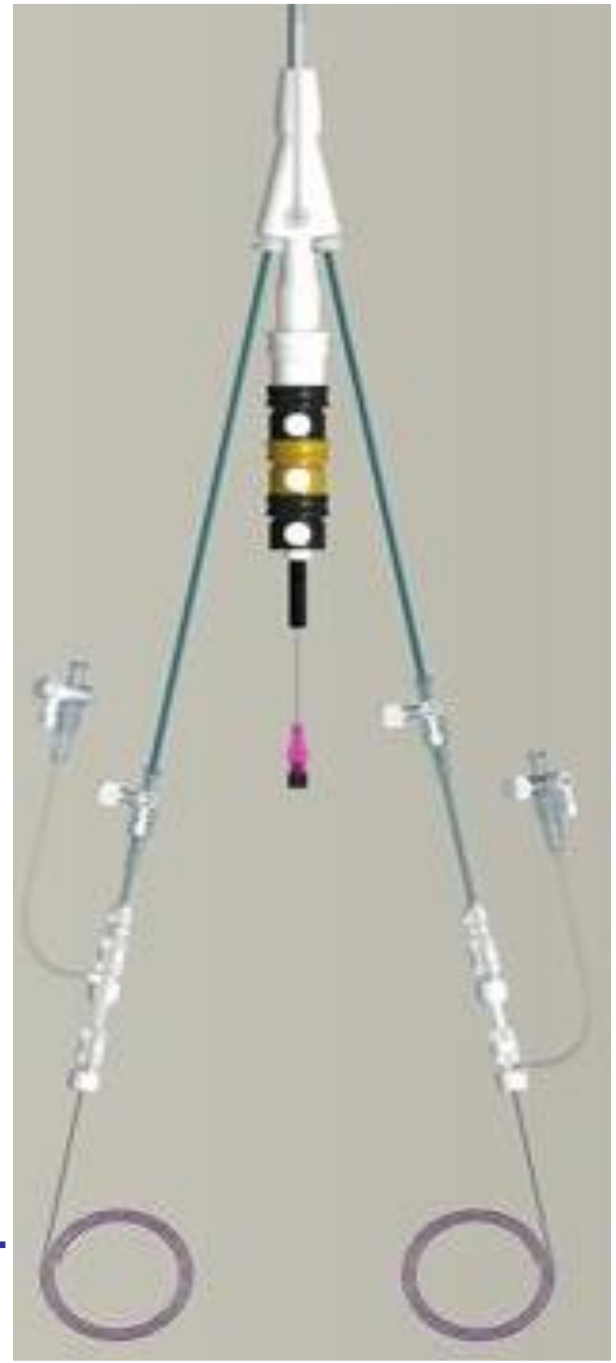

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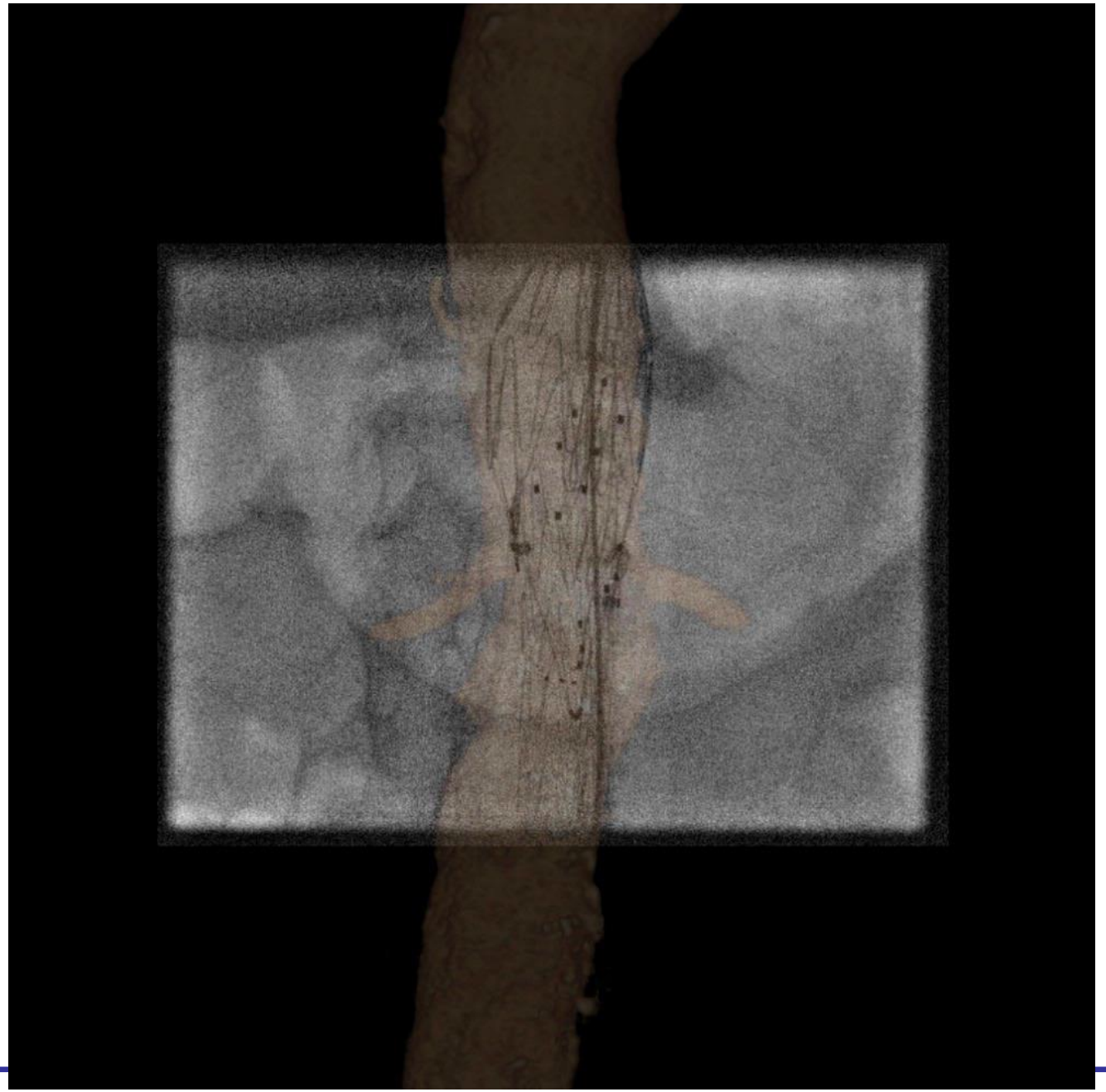
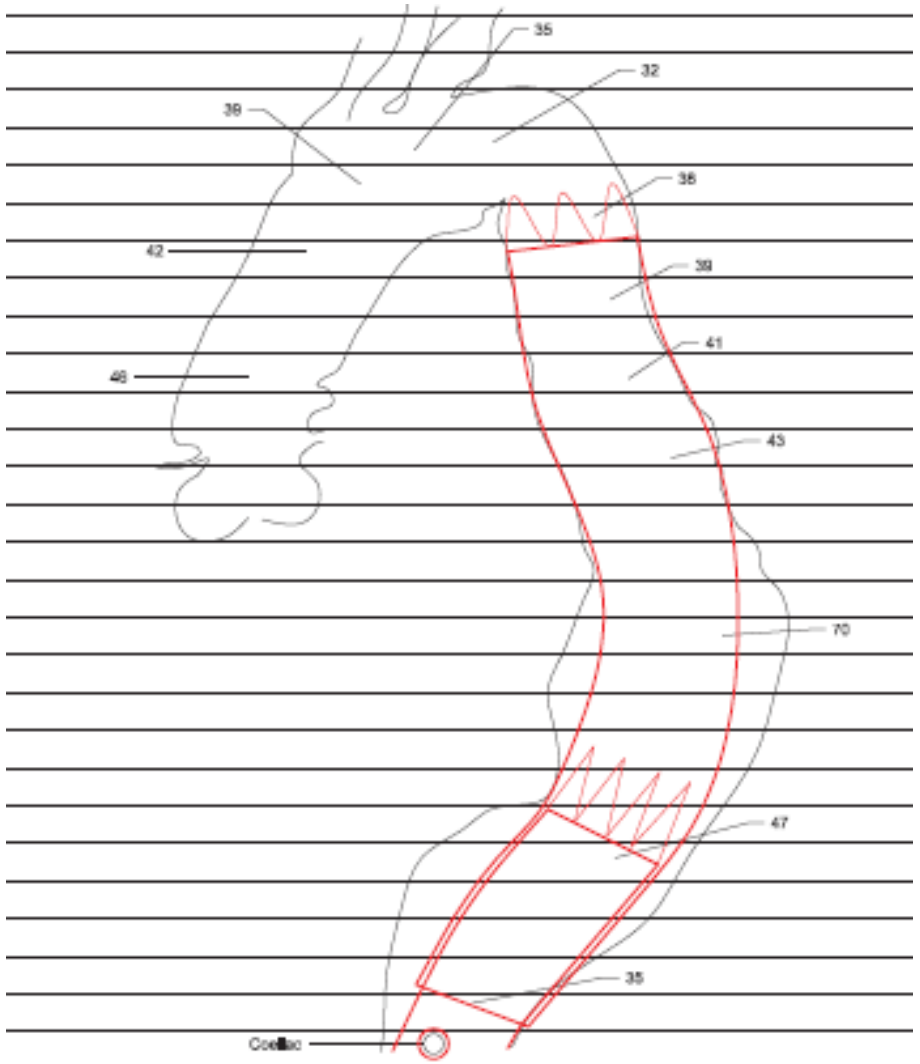



Non GE image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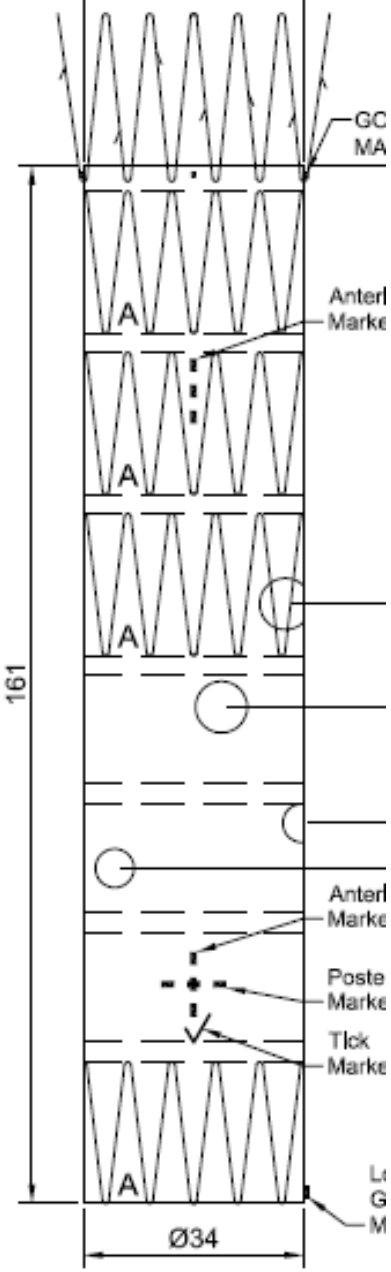
Coeliac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Tick
Marke
A
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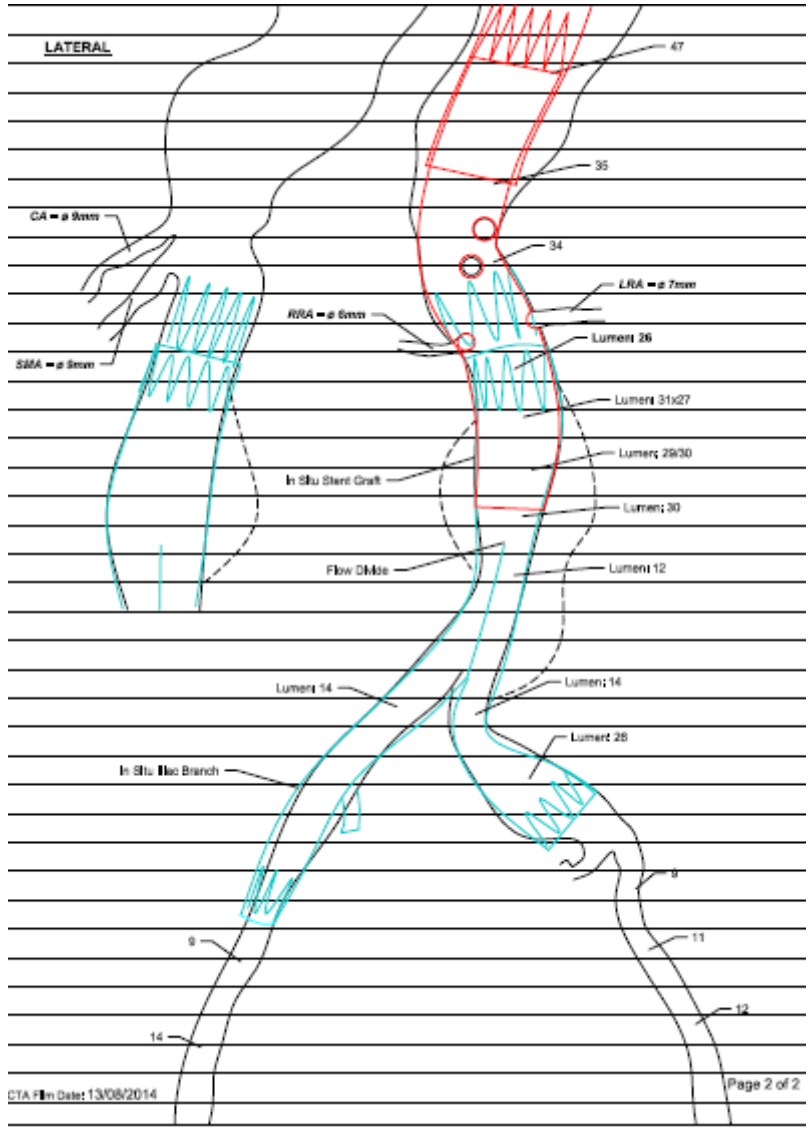
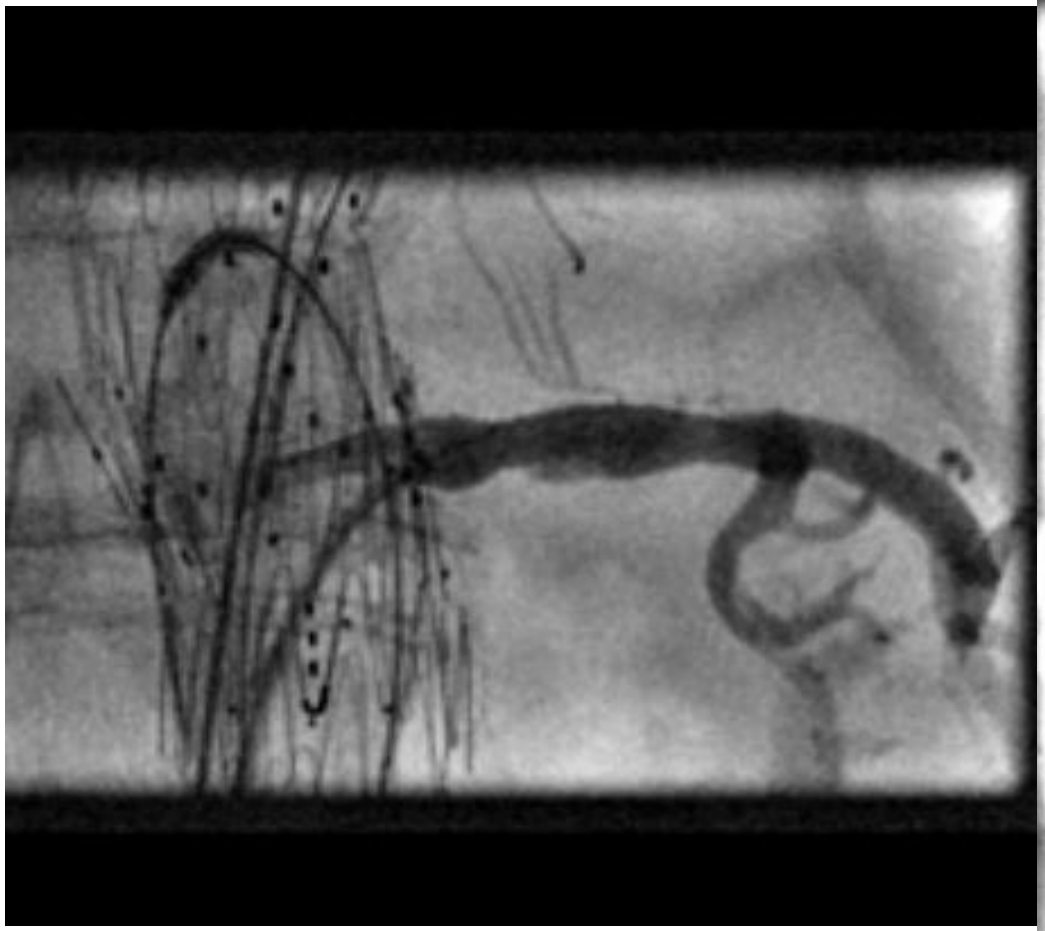
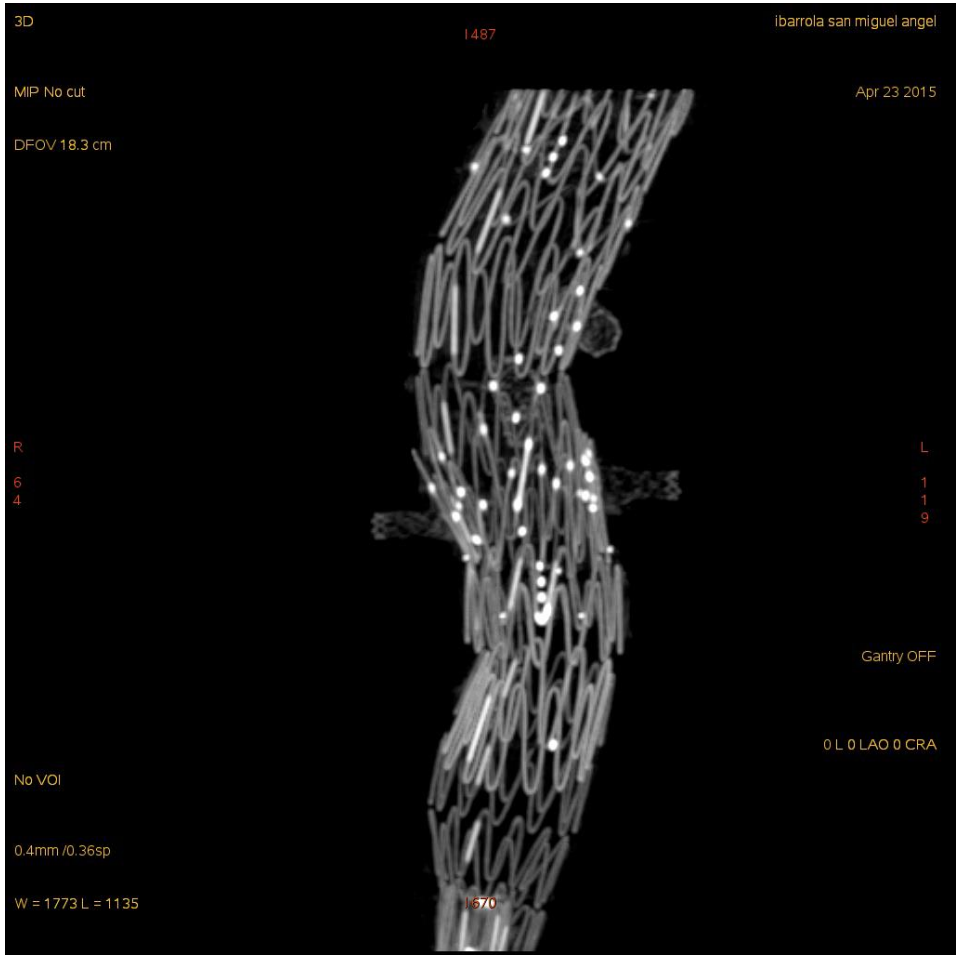

LATERAL
47
35
CA – ø 9mm
34
LRA – ø 7mm
RRA – ø 6mm
Lumen 26
SMA – ø 6mm
Lumen 31x27
Lumen; 29/30
In Situ Stent Graft
Lumen; 30
Flow Divide
Lumen 12
Lumen 14
Lumen; 14
Lumen 28
In Situ Iliac Branch
9
9
11
12
14
CTA Film Date: 13/08/2014
Page 2 of 2




3D
I 487
ibarrola san miguel angel
MIP No cut
Apr 23 2015
DFOV 18.3 cm
R
6
4
L
1
1
9
Gantry OFF
0 L 0 LAO 0 CRA
No VOI
0.4mm /0.36sp
W = 1773 L = 1135
I 670


Non GE image

CONCLUSIONS

- Match mid term outcomes of OS in high risk patients
- Low risk patients?
- High volume centers
  - Technical success
  - Peri operative management