Endovascular Approaches to TAAA Aneurysms: T-Branch Endograft

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Centre Hospitalier Régional
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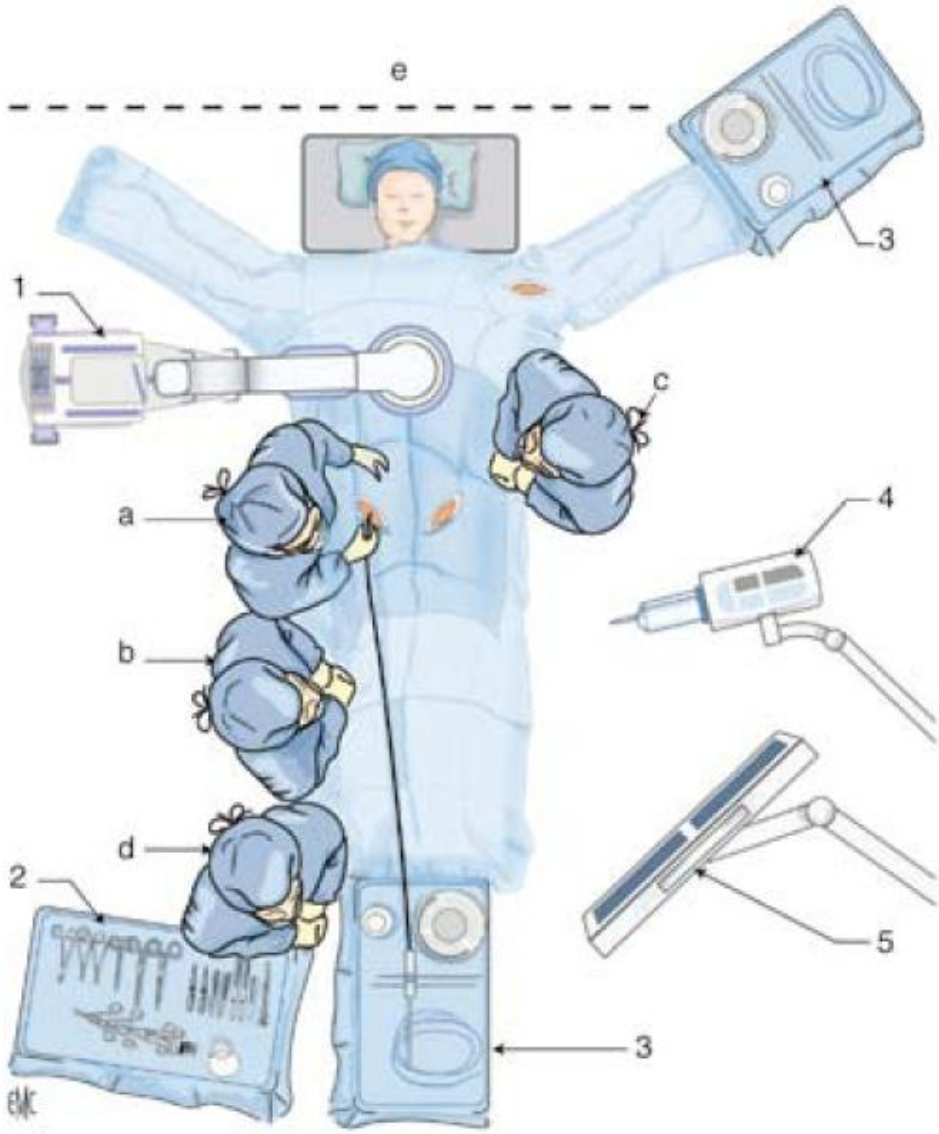
Disclosures

- Research support, Consulting
  - Cook Inc, GE Healthcare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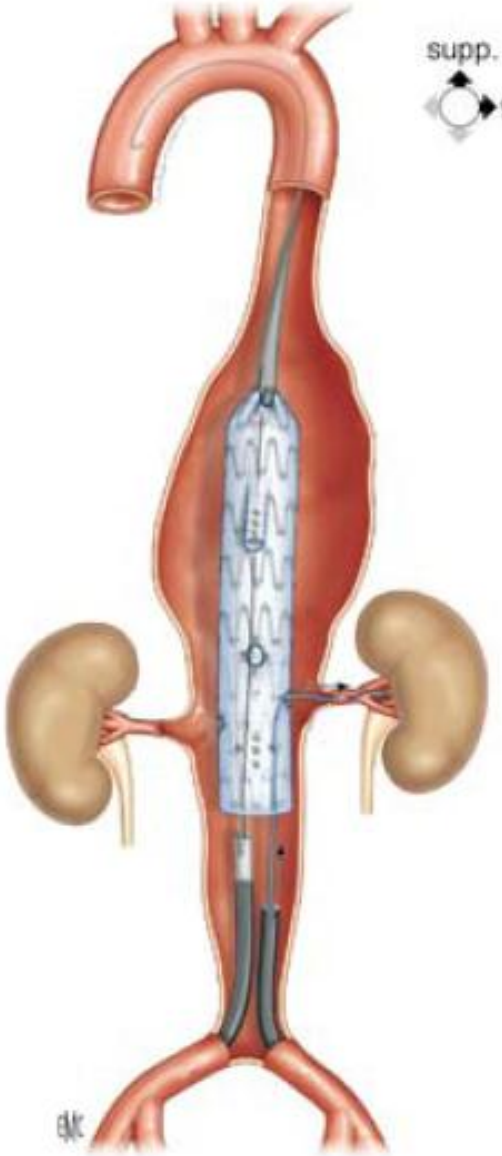
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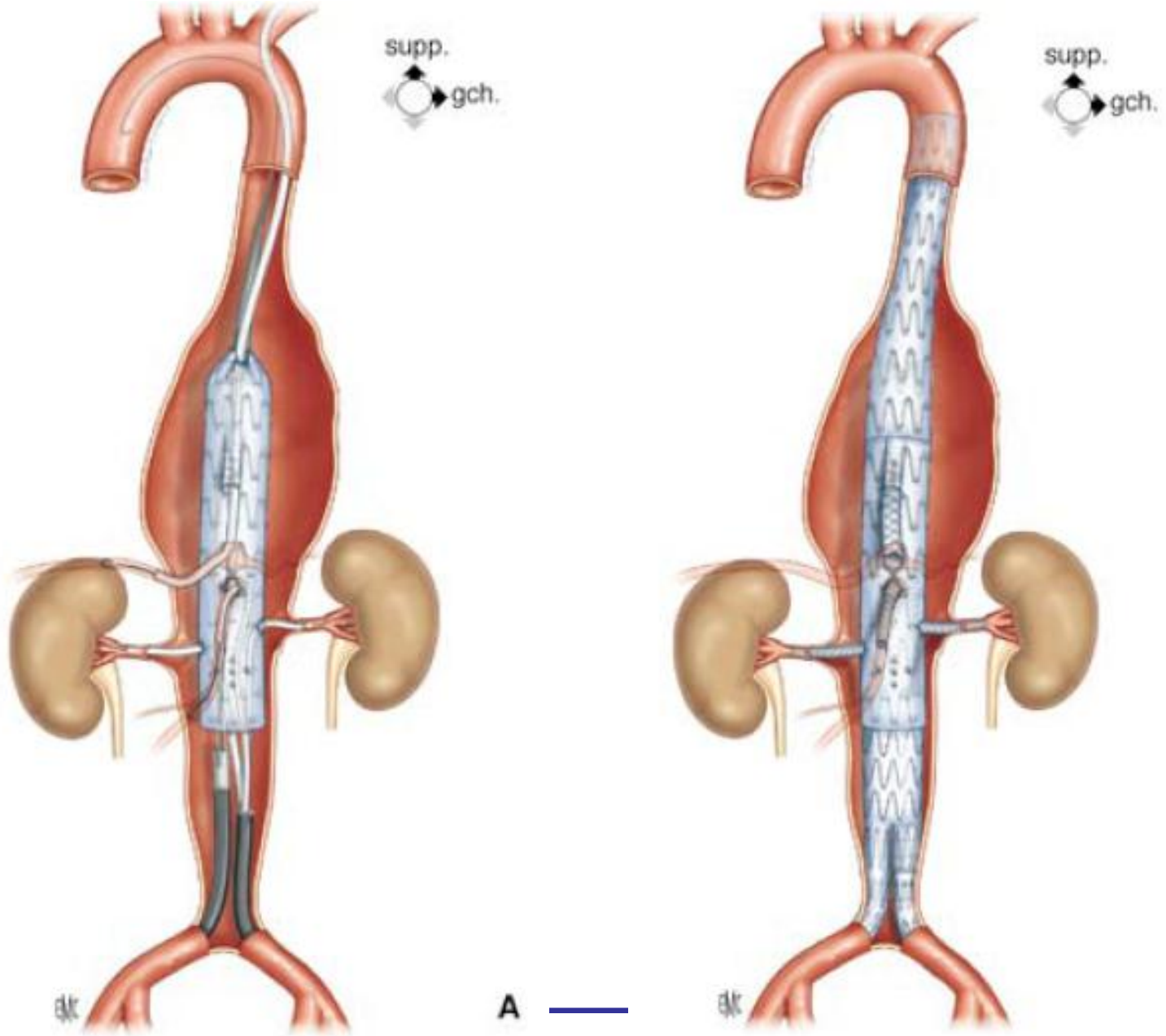

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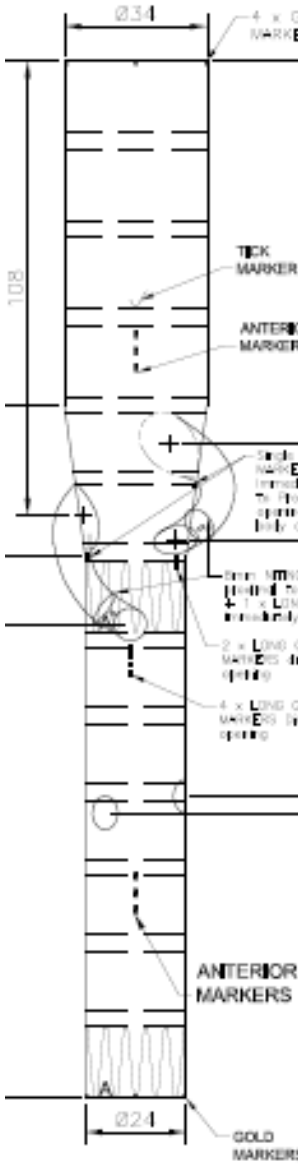

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Endovascular treatment of thoracoabdominal aortic aneurysms

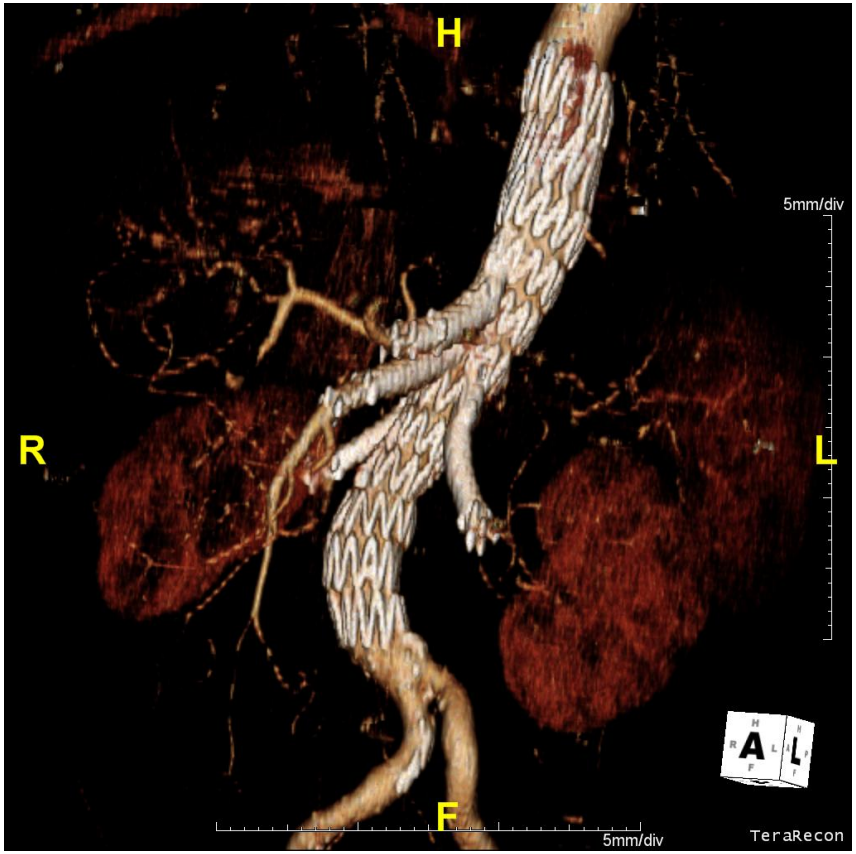
Matthieu Guillou, MD,[a] Aurelia Bianchini, MD,[a] Jonathan Sobocinski, MD,[a] Blandine Maurel, MD,[a] Piervito D'elia, MD,[a] Mark Tyrrell, MD,[b] Richard Azzaoui, MD,[a] and **Stéphan Haulon, MD, PhD,[a]** *Lille, France; and London, United Kingdom*

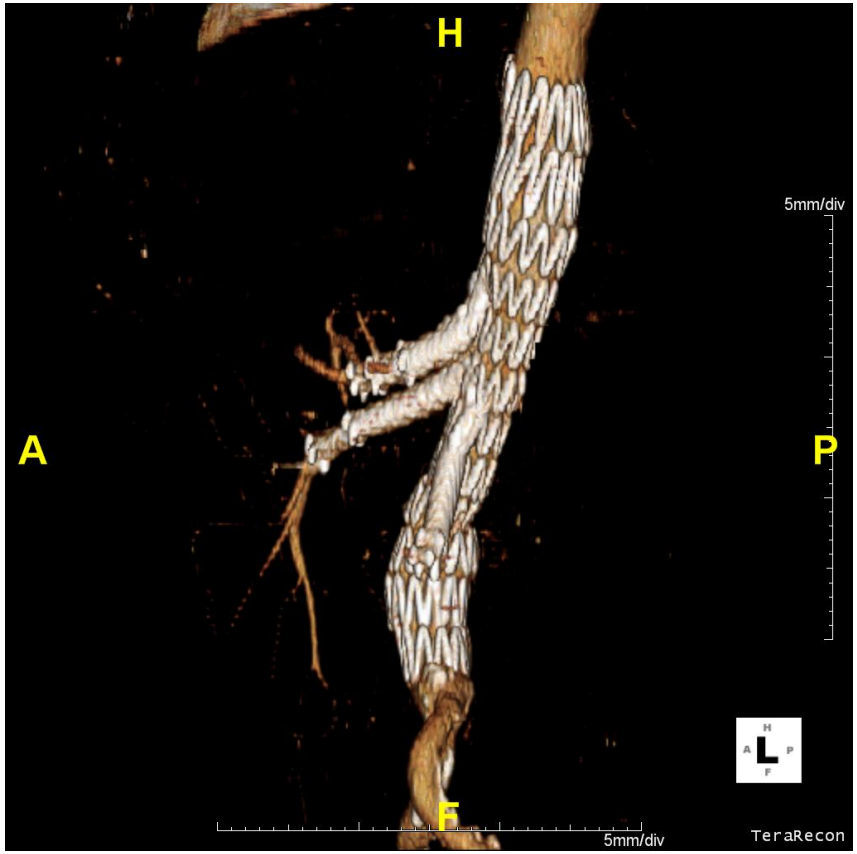
Background: **Development in endograft design has extended endovascular treatment to include thoracoabdominal aortic aneurysms (TAAA). We report our experience using fenestrated and branched endografts in the management of TAAA.**
Methods: **We analyzed a cohort of consecutive patients treated electively for TAAA using endovascular techniques between 2006 and 2011. All data were collected prospectively. The relationships between preoperative risk factors and clinical outcome were examined using univariate and multivariate statistical techniques. We also compared the outcomes between 33 previously published early cases (EC) with the last 56 later cases (LC).**
Results: **Eighty-nine patients (83 men) were treated. Median age was 69 years. All patients were deemed unfit for open surgery. The 30-day and in-hospital mortality rates were 8.9% and 10%, respectively. Multivariate analysis showed in-hospital mortality was associated with preoperative chronic renal failure and advanced age. Higher postoperative mean arterial blood pressure was a protective factor. Technical success rate was 96.6% (94% and 98% in the EC and LC groups, respectively; $P = .14$). The spinal cord ischemia (SCI) rate was 7.8% (15% and 3% in the EC and LC groups, respectively; $P = .063$) and was associated with chronic obstructive pulmonary disease and procedure duration. Six patients (6.7%) required temporary filtration, but none required permanent renal support (associated with left ventricular ejection fraction <40% and procedure duration). Median procedure duration decreased from 232 to 203 minutes ($P = .01$) in the EC and LC groups, respectively. Actuarial survival was 86.8% ± 3.7% at 1 year and 74.7% ± 6% at 2 years.**
Conclusions: **Although we have treated a cohort at high operative risk, our midterm results compare favorably with the published series of conventional surgery. Accurate hemodynamic control represented by high-normal perioperative blood pressure seems to protect against severe postoperative complications. (J Vasc Surg 2012;56:65-73.)**

Fundamental Guidelines for eTAAA repair

- Repair to healthy aorta
- Maximize device overlap
- Use branches when you have room and fenestrations when you don’t
- Minimize risk of paraplegia

Off the Shelf 4-Branch Device





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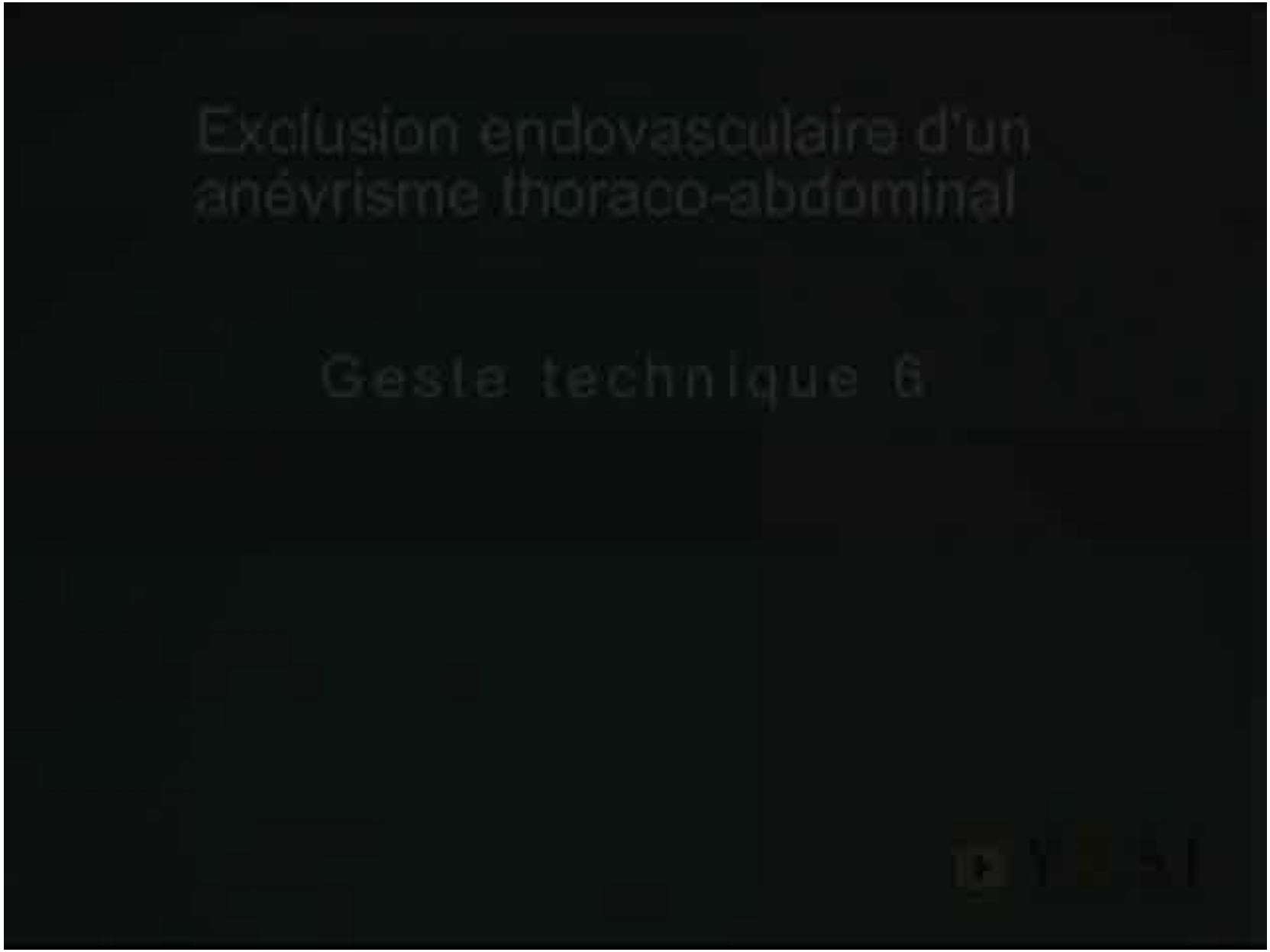
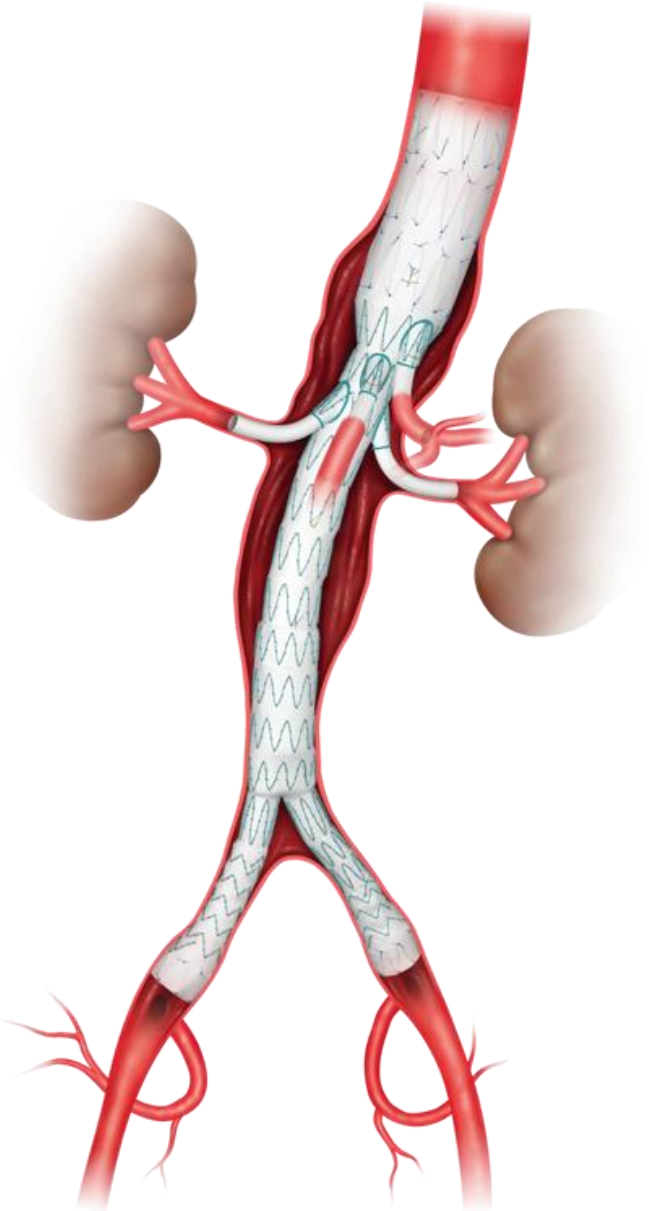
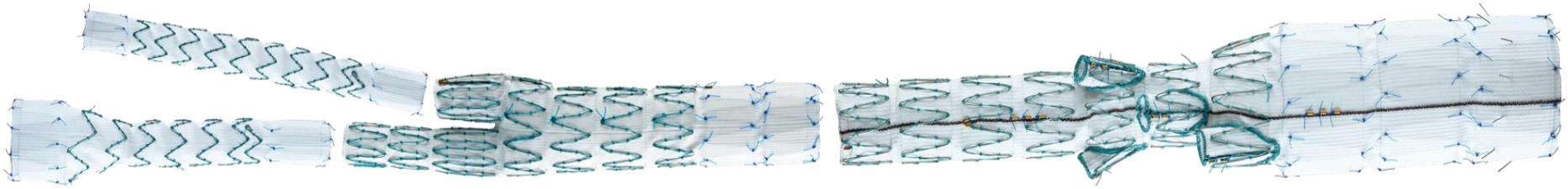

Exclusion endovasculaire d'un
anévrisme thoraco-abdominal
Geste technique 6

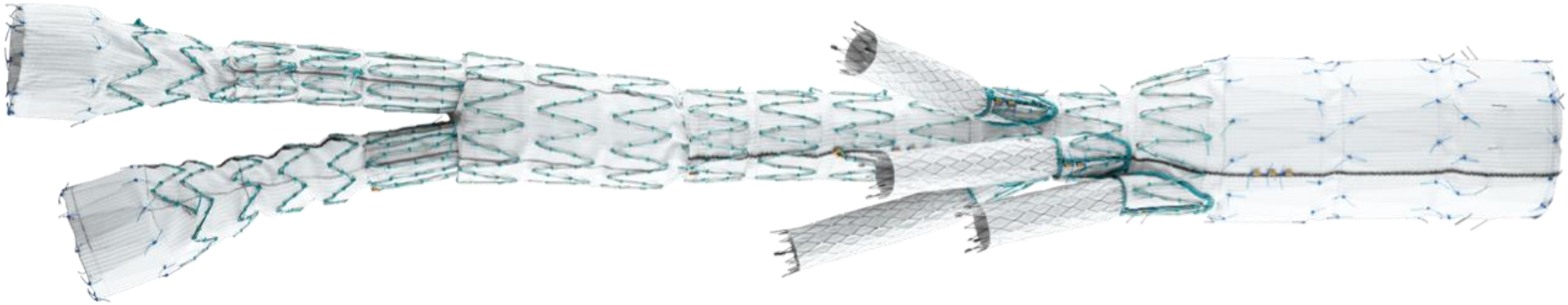


T-Branch Endograft

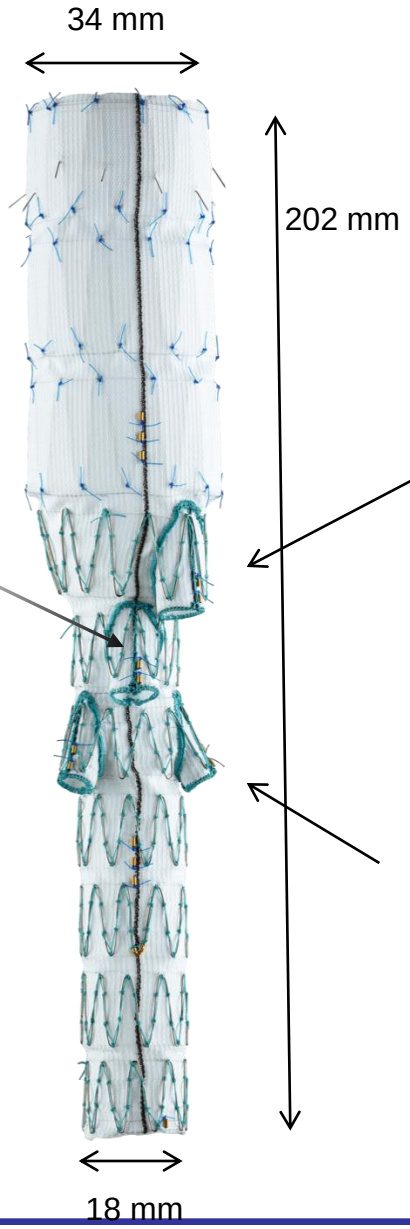
Suitable for a wide range of TAAA anatomy

Modular system





One size and configuration



SMA Branch

Diameter: 8 mm
Length: 18 mm
Distance from proximal end of graft to distal end of branch: 117 mm
Clock: 12:00

Celiac Branch

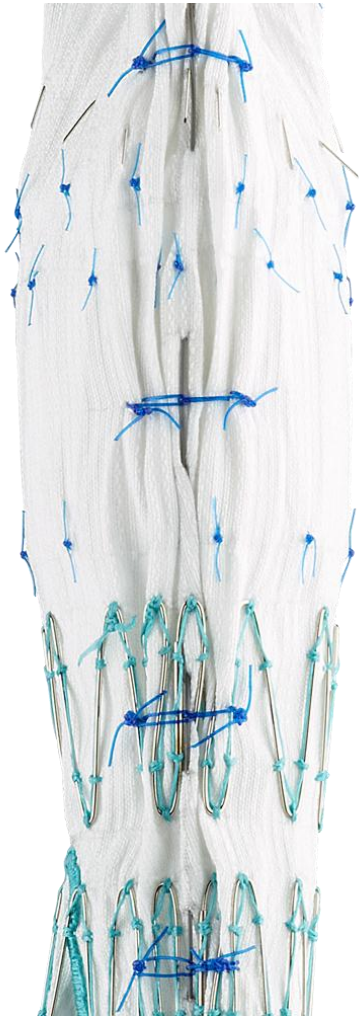
Diameter: 8 mm
Length: 21 mm
Distance from proximal end of graft to distal end of branch: 99 mm
Clock: 1:00

Right Renal Branch

Diameter: 6 mm
Length: 18 mm
Distance from proximal end of graft to distal end of branch: 135 mm
Clock: 10:00

Left Renal Branch

Diameter: 6 mm
Length: 18 mm
Distance from proximal end of graft to distal end of branch: 135 mm
Clock: 3:00



Zenith® t-Branch™
THORACOABDOMINAL ENDOVASCULAR GRAFT

DEVICE SELECTION FORM

Date: _____

Hospital: _____

Patient ID: _____

Physician Name: _____

Physician Phone: _____

Physician E-mail: _____

Date of Procedure: _____

PO Number: _____

PLEASE CONTACT COOK MEDICAL CUSTOMER SERVICE CENTRE TO PLACE AN ORDER.

Pieces required:

TBRANCH - 34 - 18 - 202

UNIBODY - 22 - ☐

ZSLE - ☐ - ☐ - ZT

ZSLE - ☐ - ☐ - ZT

Additional components required:

_____

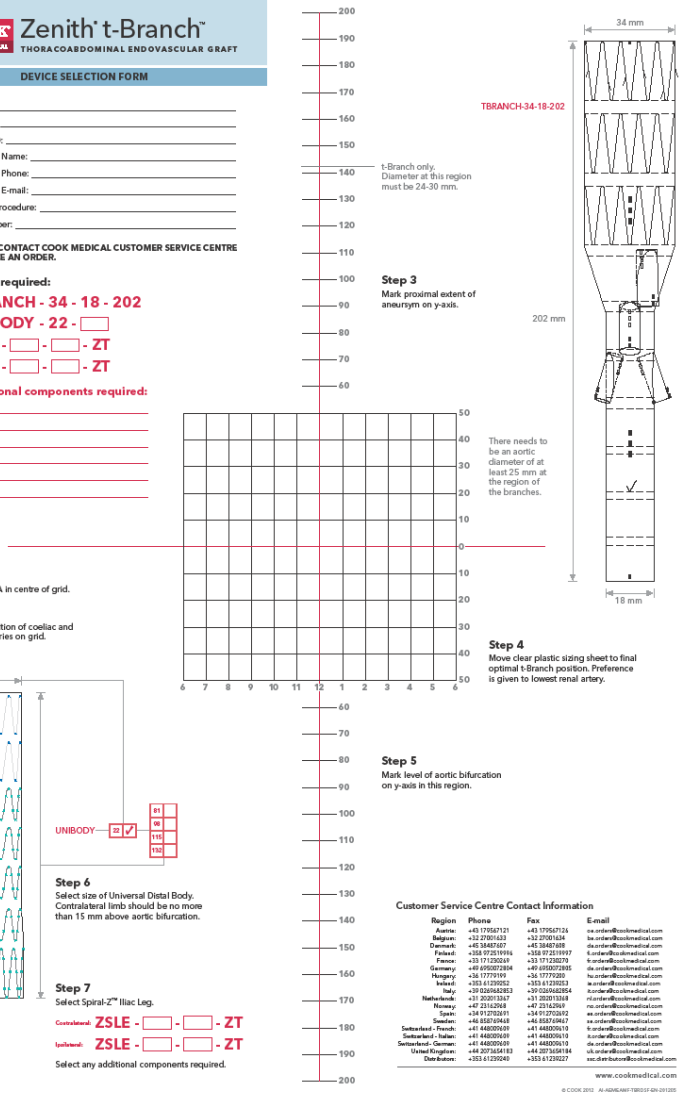
_____

_____

_____

_____

_____



Step 1
Mark SMA in centre of grid.

Step 2
Mark position of coeliac and renal arteries on grid.

Step 3
Mark proximal extent of aneurysm on y-axis.

Step 4
Move clear plastic sizing sheet to final optimal t-Branch position. Preference is given to lowest renal artery.

Step 5
Mark level of aortic bifurcation on y-axis in this region.

Step 6
Select size of Universal Distal Body. Contralateral limb should be no more than 15 mm above aortic bifurcation.

Step 7
Select Spiral-Z™ Iliac Leg.

Contralateral: **ZSLE - ☐ - ☐ - ZT**

Ipsilateral: **ZSLE - ☐ - ☐ - ZT**

Select any additional components required.

Customer Service Centre Contact Information

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Finland:	+358 972519986	+358 972519987	fi.orders@cookmedical.com
France:	+33 171230249	+33 171230270	fr.orders@cookmedical.com
Germany:	+49 69500728114	+49 69500728115	de.orders@cookmedical.com
Hungary:	+36 17779199	+36 17779280	hu.orders@cookmedical.com
Ireland:	+353 61239252	+353 61239253	ie.orders@cookmedical.com
Italy:	+39 0269682853	+39 0269682854	it.orders@cookmedical.com
Netherlands:	+31 202013267	+31 202013268	nl.orders@cookmedical.com
Norway:	+47 23162968	+47 23162969	no.orders@cookmedical.com
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Switzerland – Italian:	+41 448005699	+41 448005610	it.orders@cookmedical.com
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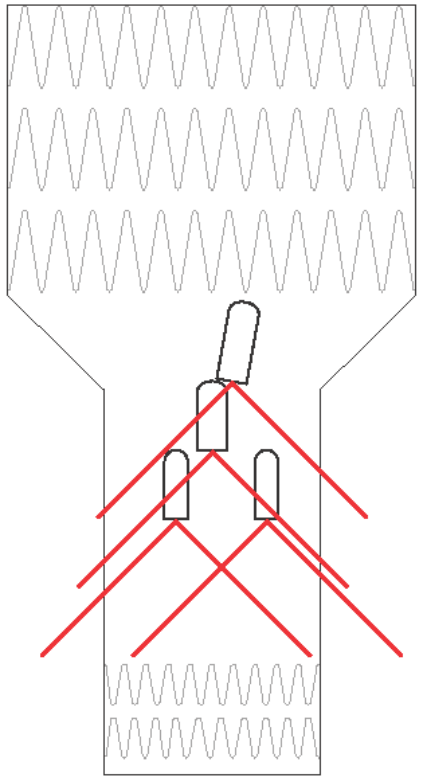
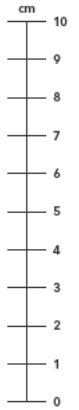
THORACOABDOMINAL ENDOVASCULAR GRAFT





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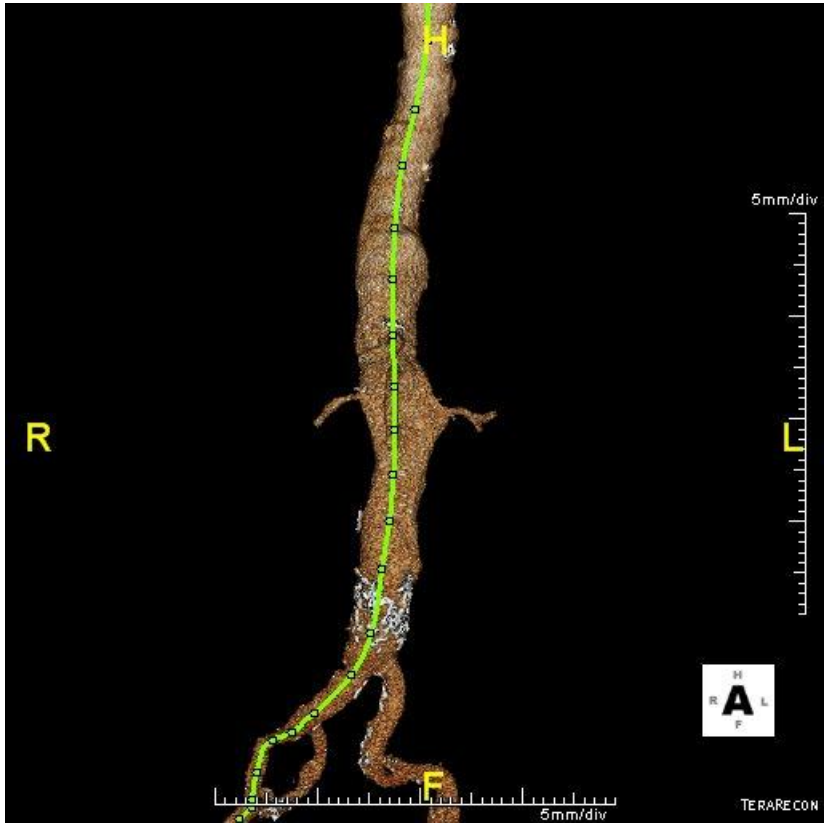
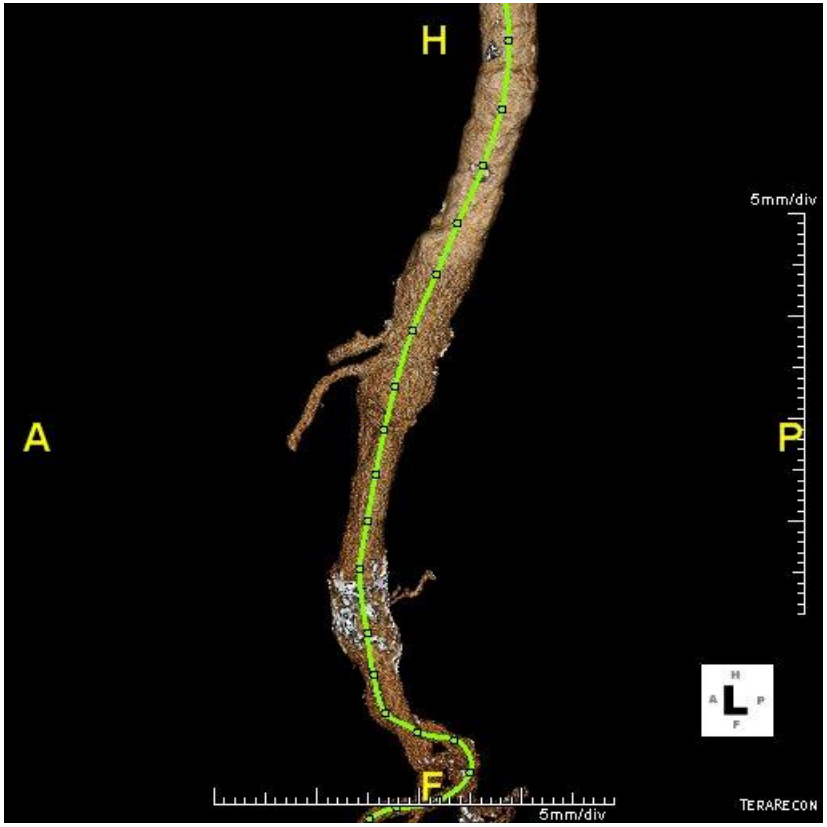
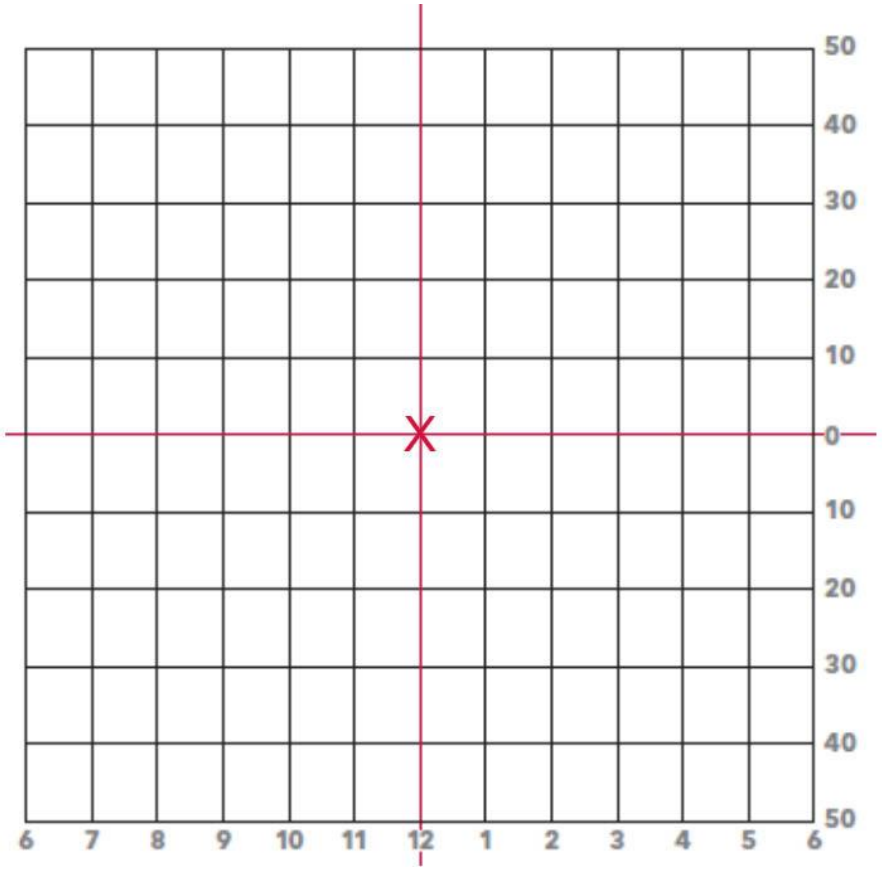
3D WORKSTATION
Create centerline

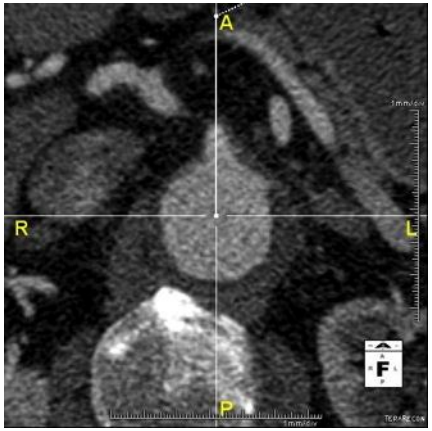


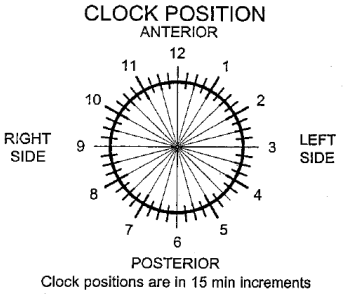


Step One

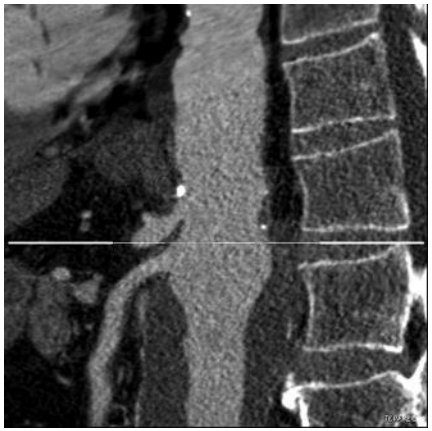
Mark level of SMA in center of grid







12:00



0 mm

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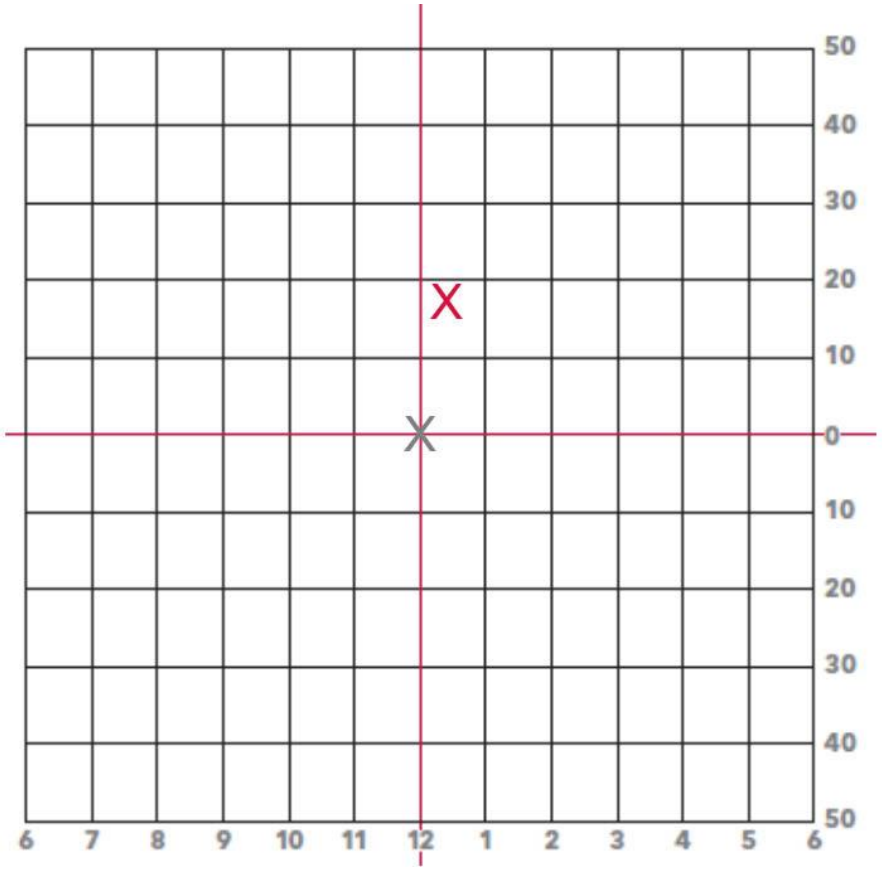
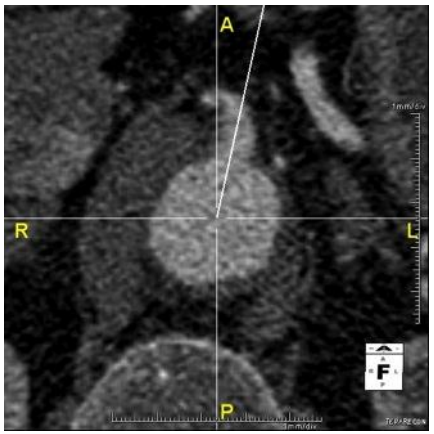
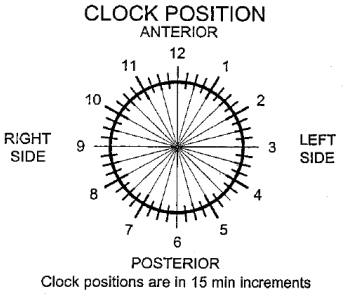
Step Two

Mark position of coeliac artery on grid







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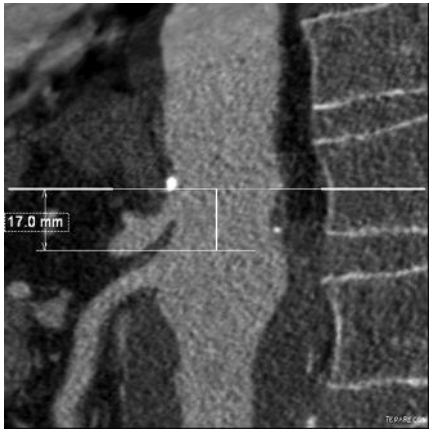
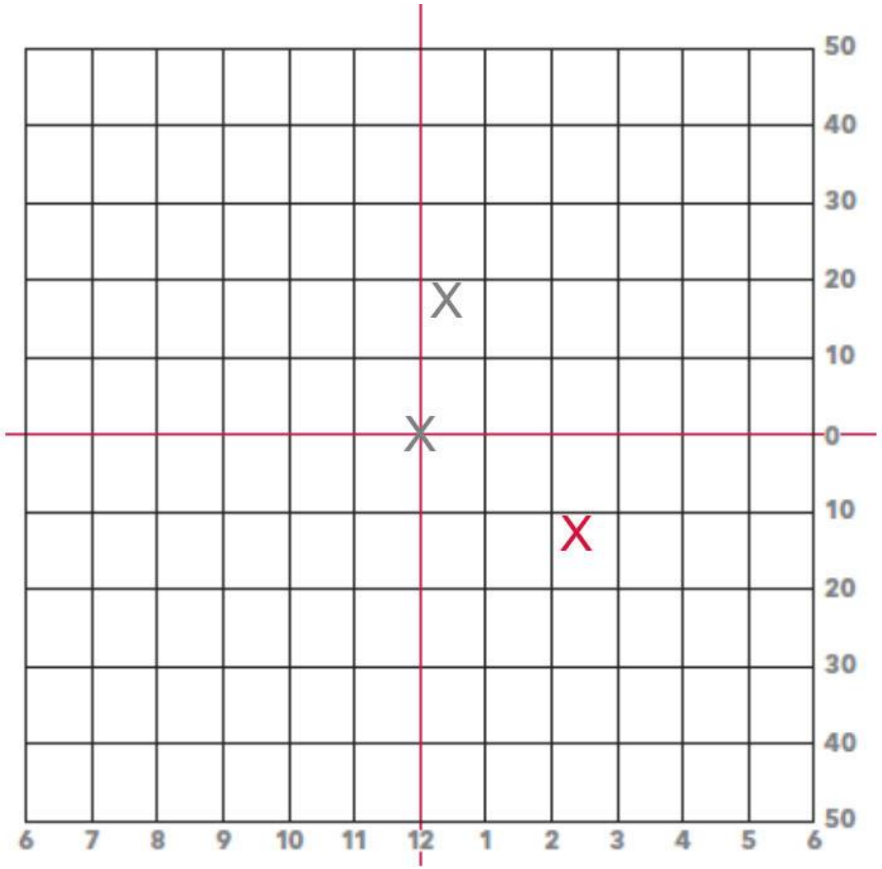
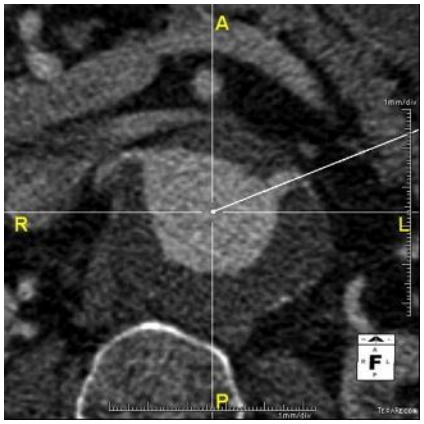


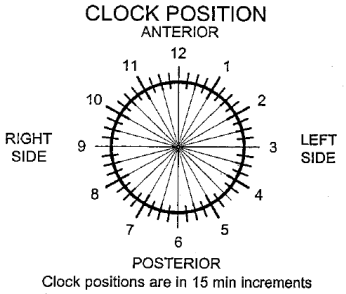
+17 mm

Step Two

Mark position of left renal artery on grid





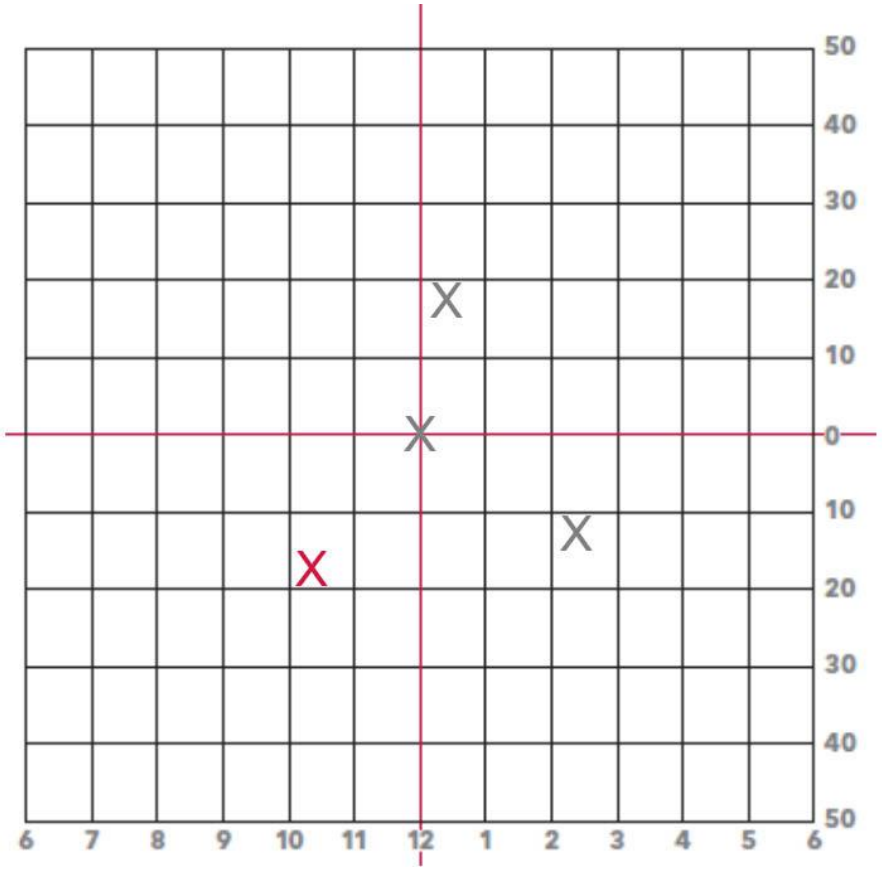


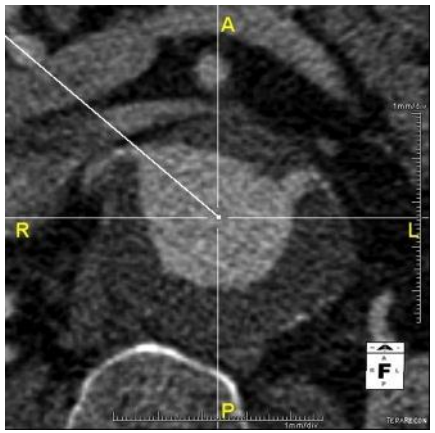
2:30

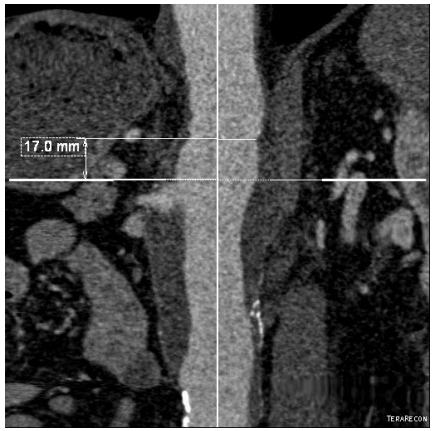
-13 mm

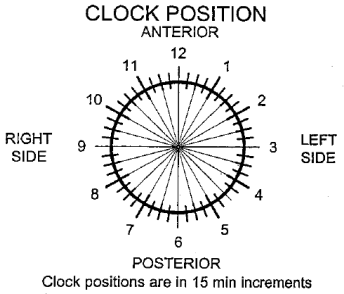
Step Two

Mark position of right renal artery on grid







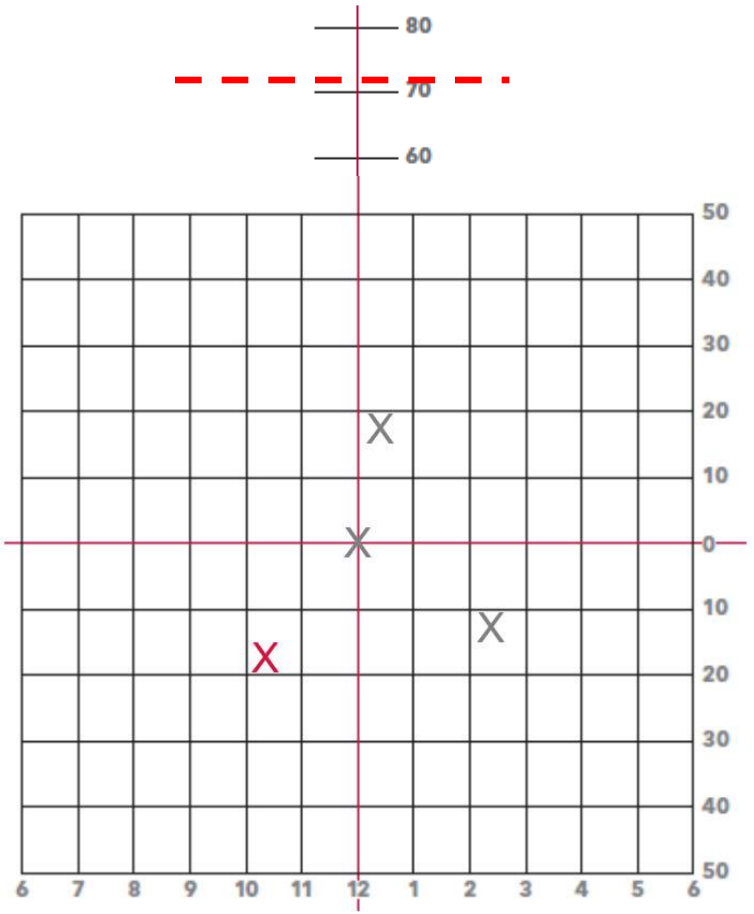


10:15

-17 mm

Step Three

Mark proximal extent of aneurysm on y-axis.



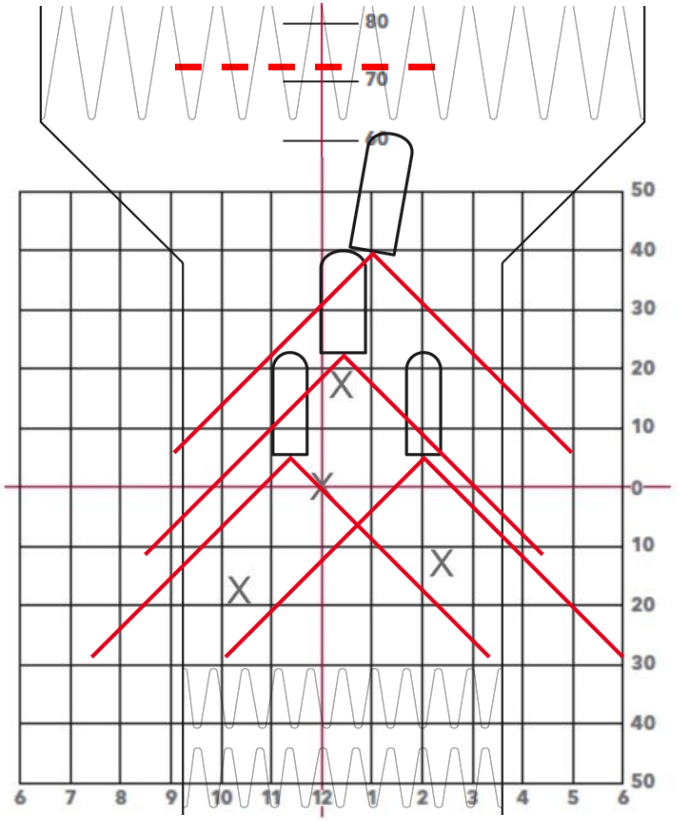
+72 mm

Step Four

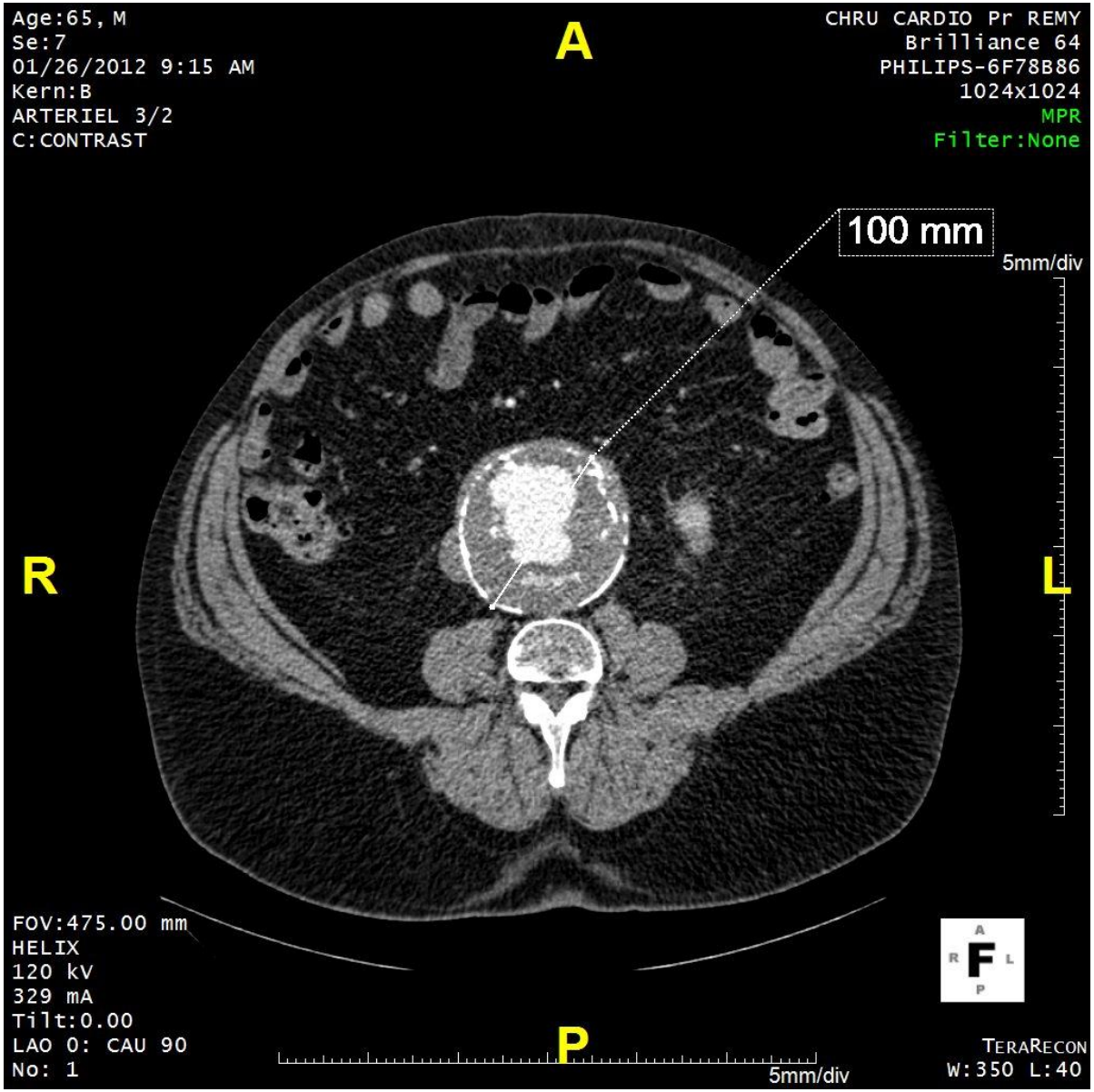
Move clear plastic sizing sheet to final optimal t-Branch position.

Ensure each target vessel is located within arc created by each pair of red lines.

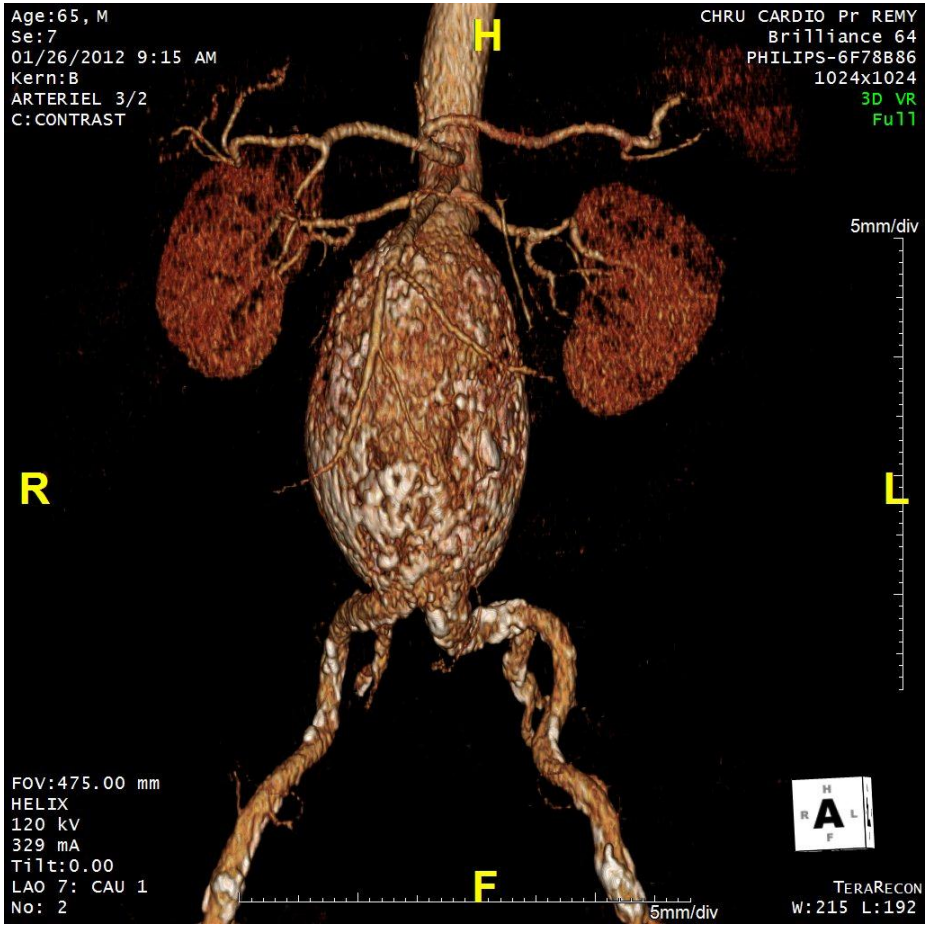
Ensure side branches are a minimum of 10 mm above target vessels.

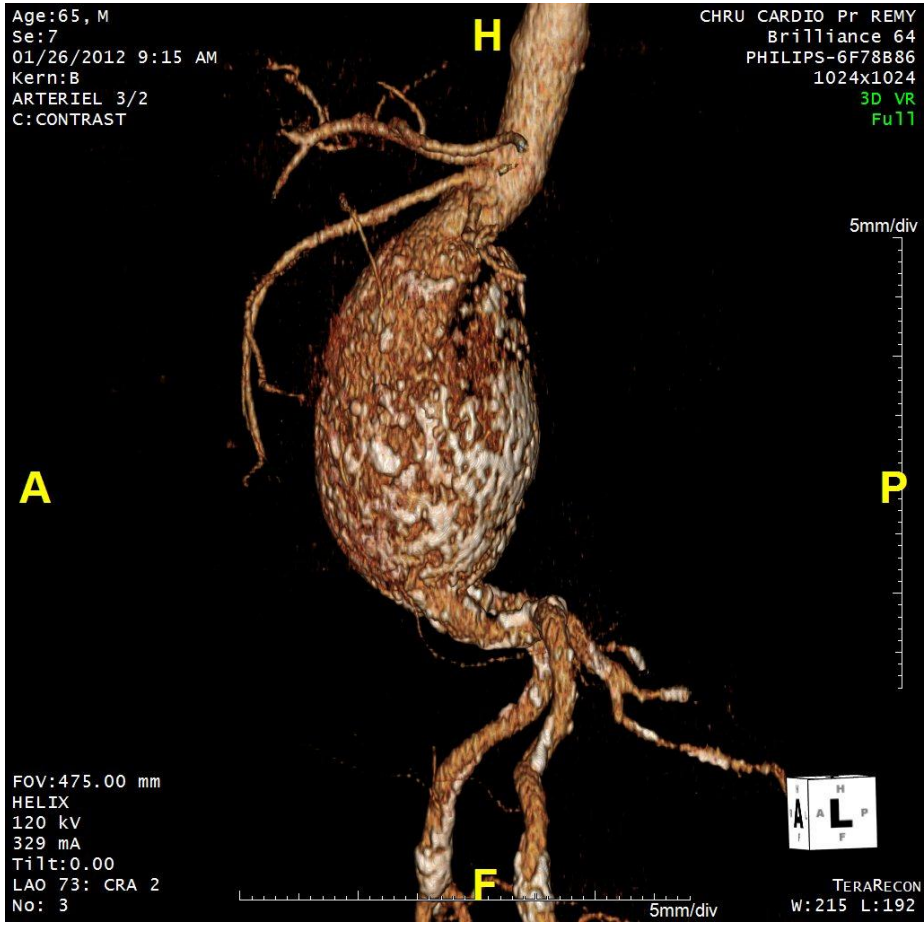


CT scan


Age:65, M
Se:7
01/26/2012 9:15 AM
Kern:B
ARTERIEL 3/2
C:CONTRAST
A
CHRU CARDIO Pr REMY
Brilliance 64
PHILIPS-6F78B86
1024x1024
MPR
Filter:None
100 mm
5mm/div
R
L
FOV:475.00 mm
HELIX
120 kV
329 mA
Tilt:0.00
LAO 0: CAU 90
No: 1
P
5mm/div
TERARECON
W:350 L:40

CT scan


Age:65, M
Se:7
01/26/2012 9:15 AM
Kern:B
ARTERIEL 3/2
C:CONTRAST
CHRU CARDIO Pr REMY
Brilliance 64
PHILIPS-6F78B86
1024x1024
3D VR
Full
H
R
L
F
5mm/div
5mm/div
FOV:475.00 mm
HELIX
120 kV
329 mA
Tilt:0.00
LAO 7: CAU 1
No: 2
TeraRecon
W:215 L:192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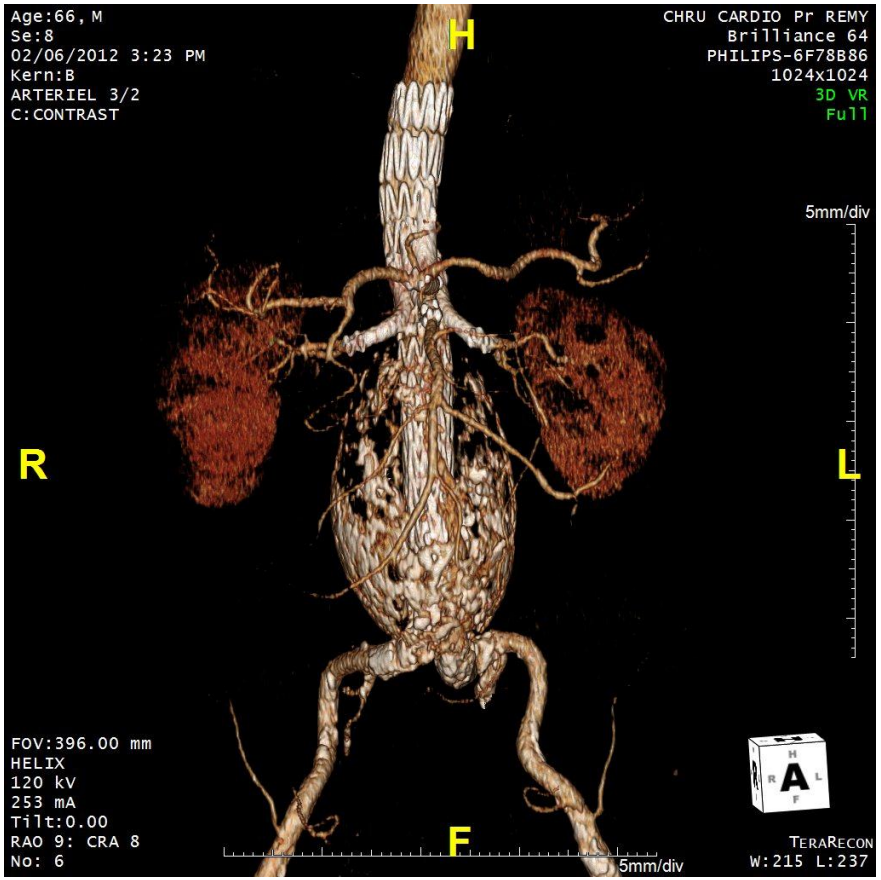
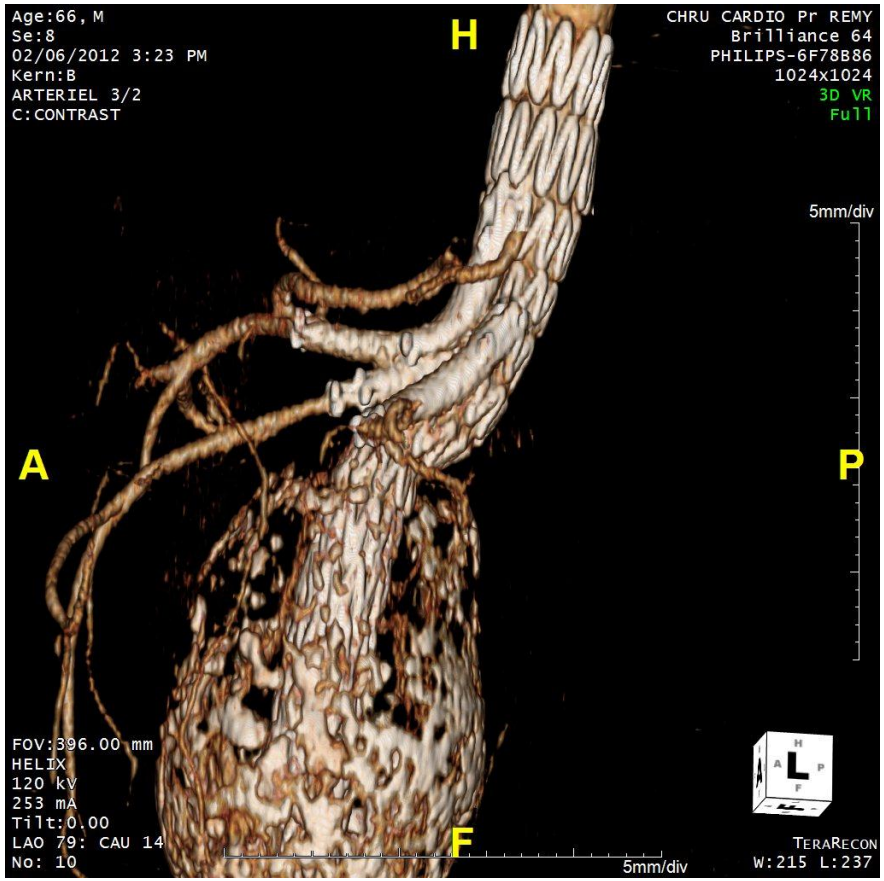
01/26/2012 9:15 AM
Kern:B
ARTERIEL 3/2
C:CONTRAST
CHRU CARDIO Pr REMY
Brilliance 64
PHILIPS-6F78B86
1024x1024
3D VR
Full
H
A
P
F
5mm/div
5mm/div
FOV:475.00 mm
HELIX
120 kV
329 mA
Tilt:0.00
LAO 73: CRA 2
No: 3
TeraRecon
W:215 L:192

- Length of the procedure : 210 minutes
- Radiation time : 2198 sec
- Radiation dose : 16,97mGym²
- Volume of contrast required : 140ml

Post-operative CT





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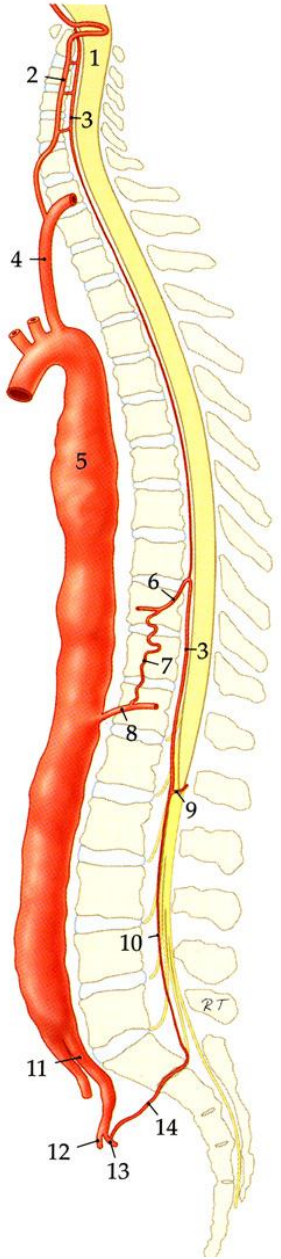
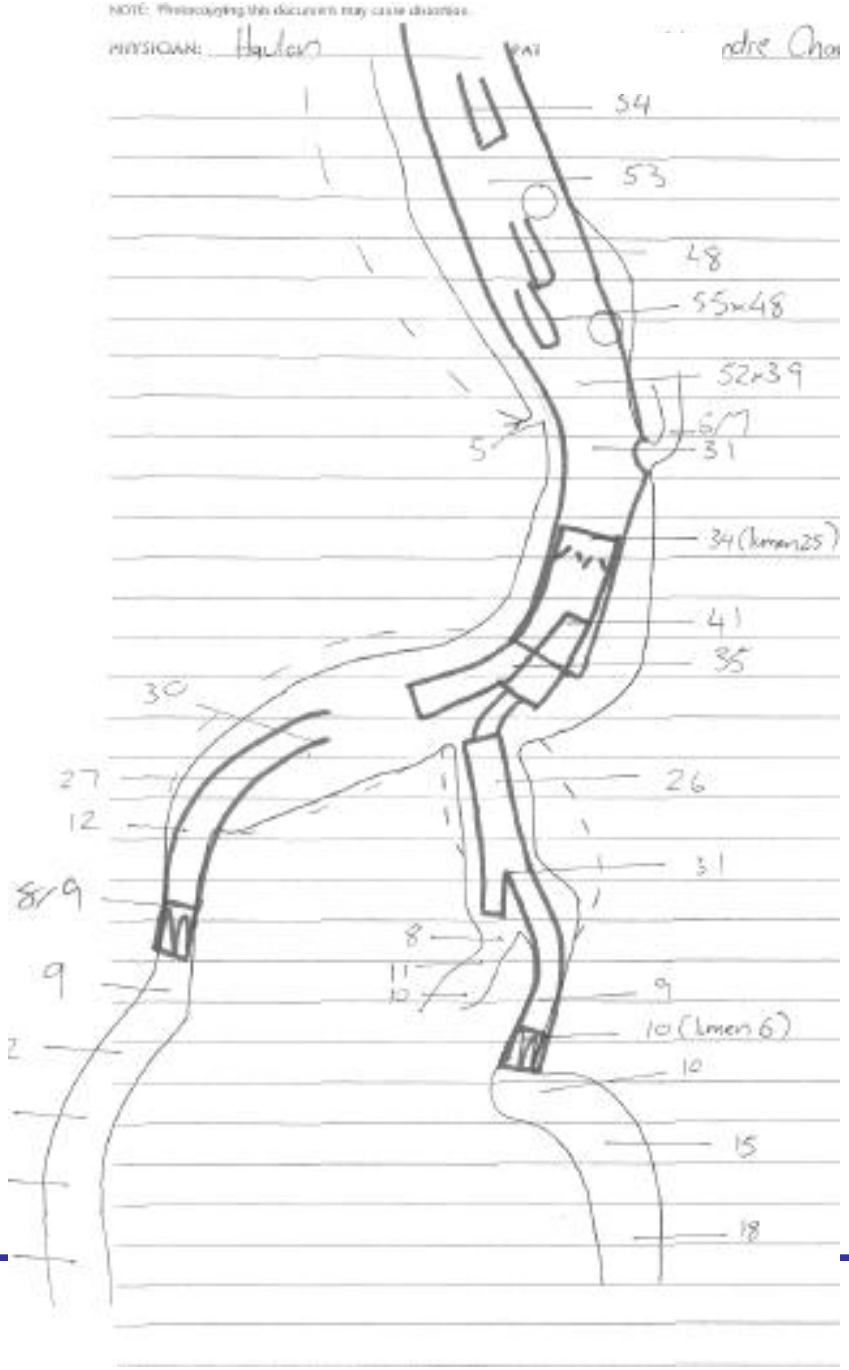
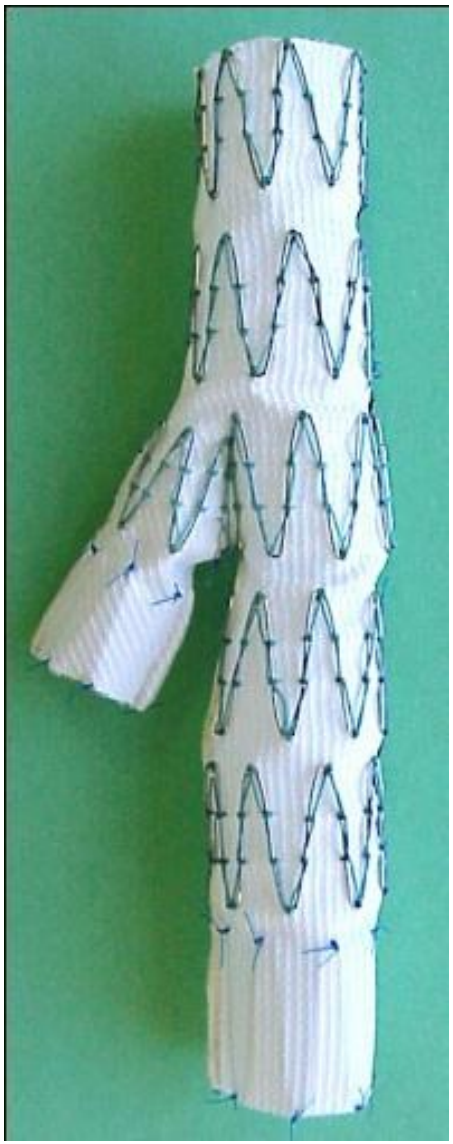
Prevention of Paraplegia/Paraperesis

- Staged procedures
- Open Hypo and LSA
- Spinal drain
- BP management




NOTE: Photocopying this document may cause distortion.
PHYSICIAN: Haulon
54
53
48
55x48
52x39
6/7
5
31
34 (lumen 25)
41
35
30
27
12
8/9
9
2
26
31
8
11
10
9
10 (lumen 6)
10
15
18




01/21/1943
Ex. 20081113162800
Se. 1
Im. 22
Frm. 22 / 43
Hôp. cardio CHRU LILLE
ID: PCHA11061056
06/11/2008
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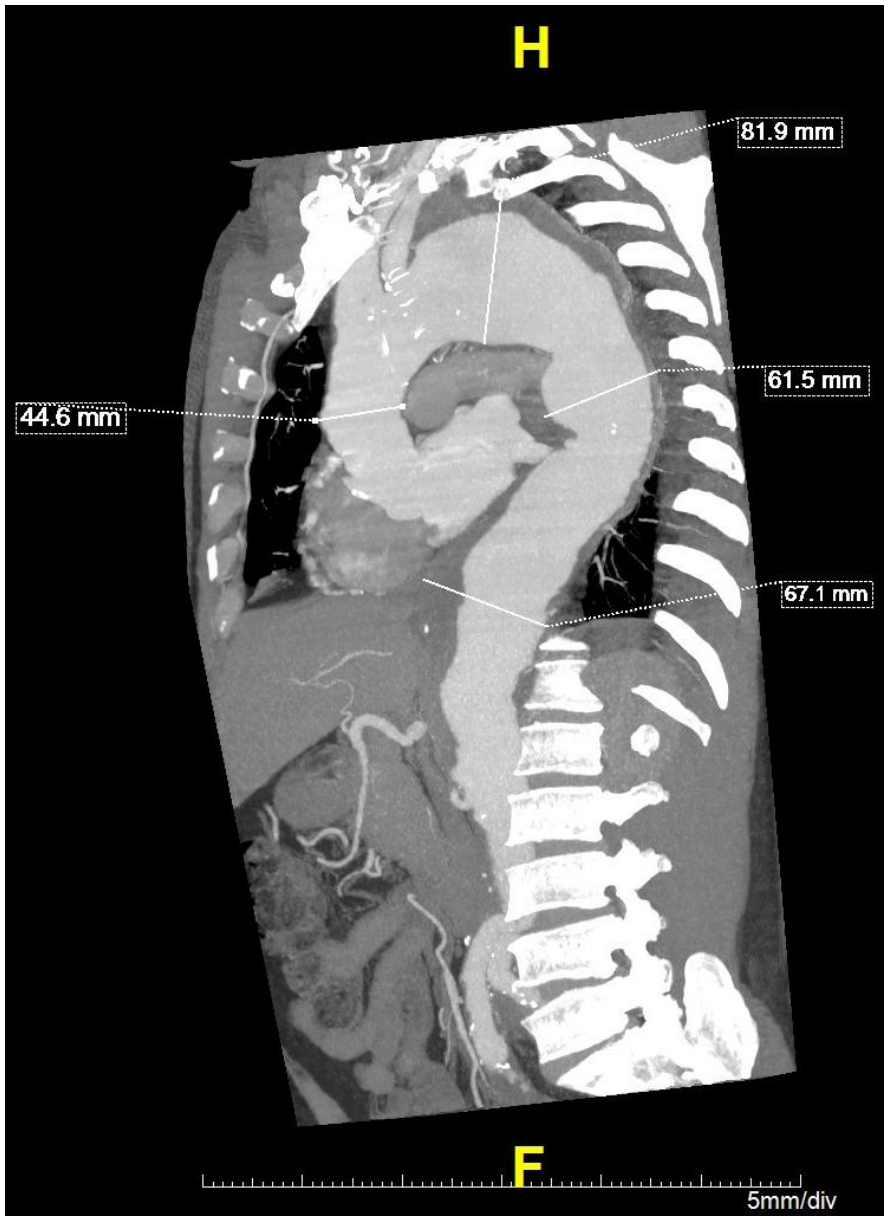
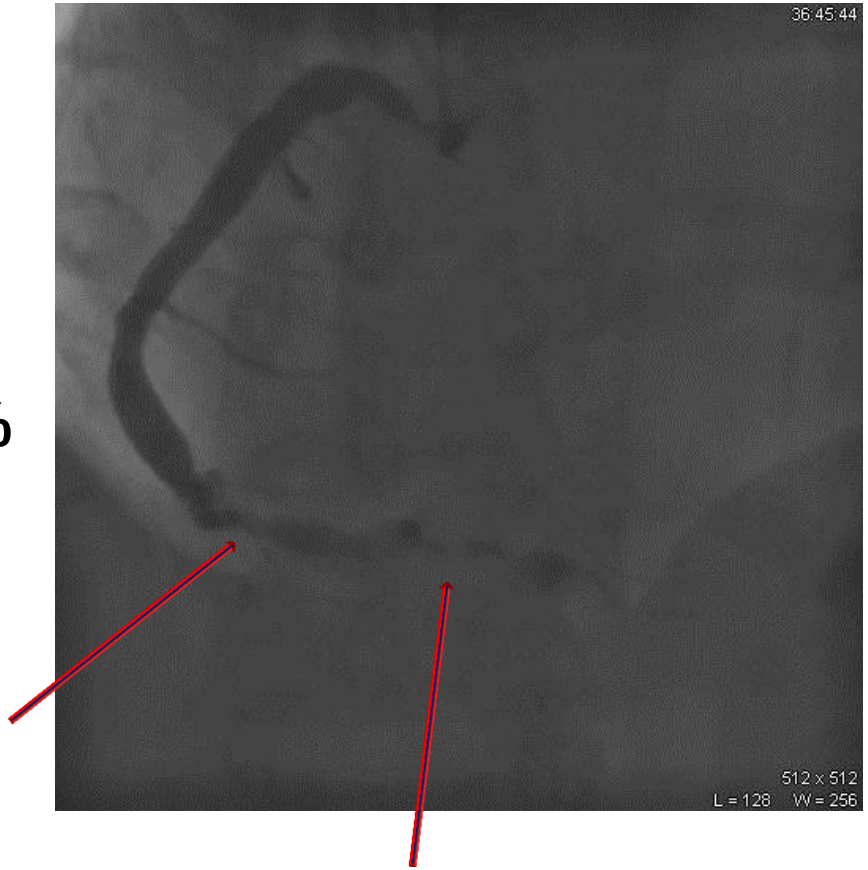
Staged Procedures

- 63 years old man
- Open AAA repair in 2009
- No connective tissue disease diagnosed


H
81.9 mm
61.5 mm
44.6 mm
67.1 mm
F
5mm/div

Preop screening

- **Dominant right coronary**
- **Left ventricular function: 35%**
- **GFR=40.2 ml/min (MDRD)**

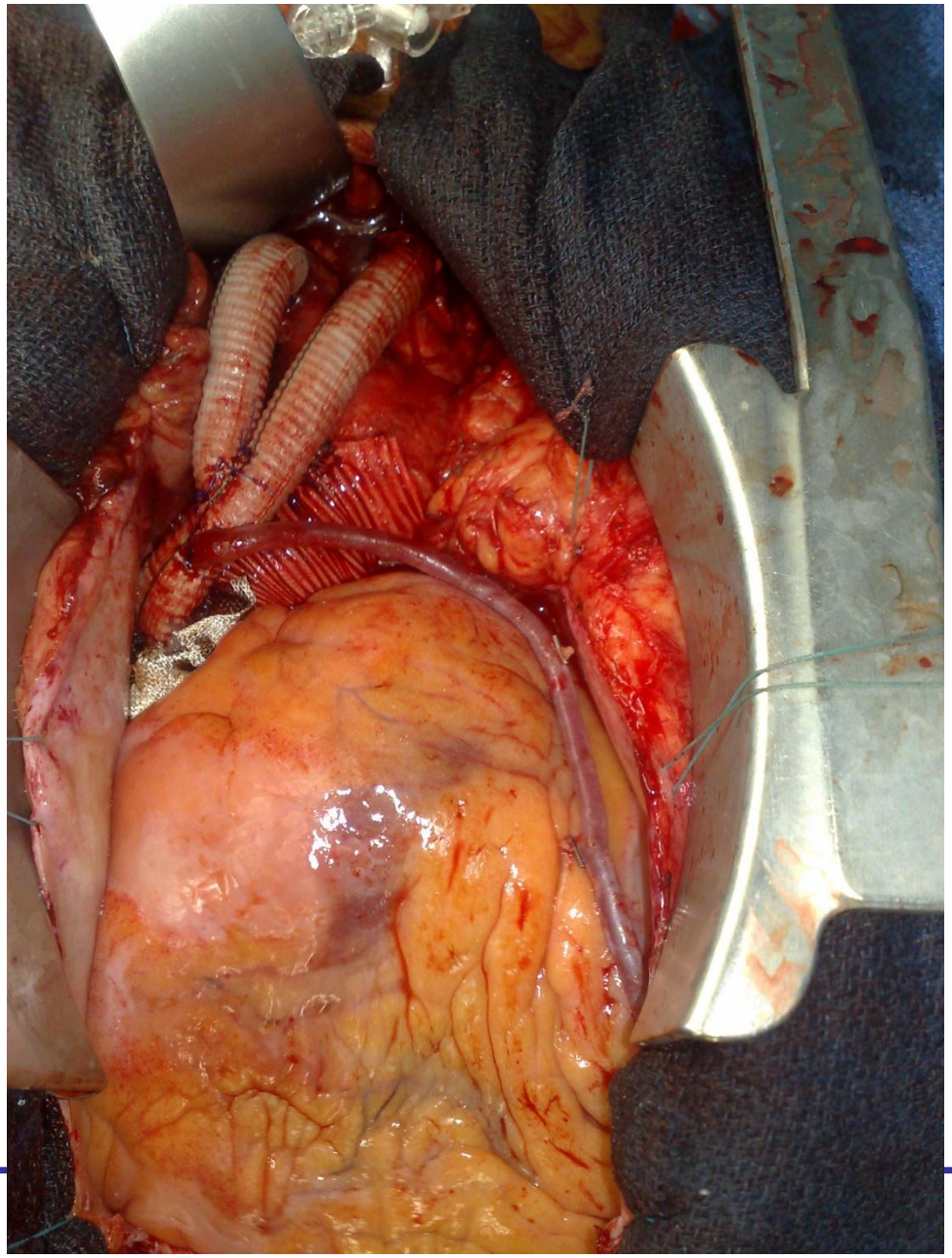


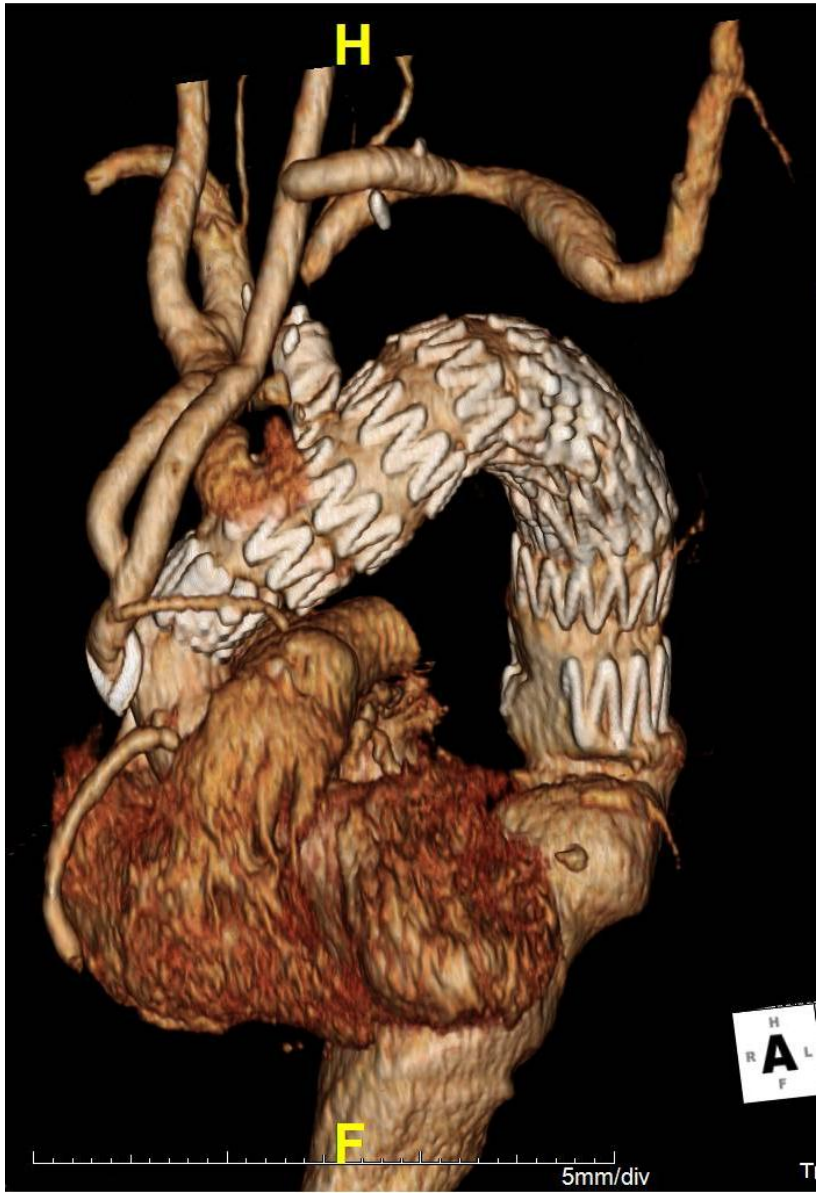
Multi-disciplinary Discussion

- 3-stage procedure:
  1. Cardiac repair:
     - Ascending aortic banding
     - right coronary bypass
     - IT and LCC debranching
  2. Endovascular repair in 2 steps:

     a)Exclusion of the arch aneurysm

     b)Exclusion of the TAA




H
F
5mm/div


H
F

CONCLUSIONS

- Standard of Care in most centers in Europe
- High volume centers performing both techniques
- T-branch requires large experience with iliac branch and fenestrated endografting