Paving and Cracking
We still need this technique

A. Millon, P.O. Thiney, J.N. Albertini,
E. Rosset, P. Feugier, P. Lermusiaux.

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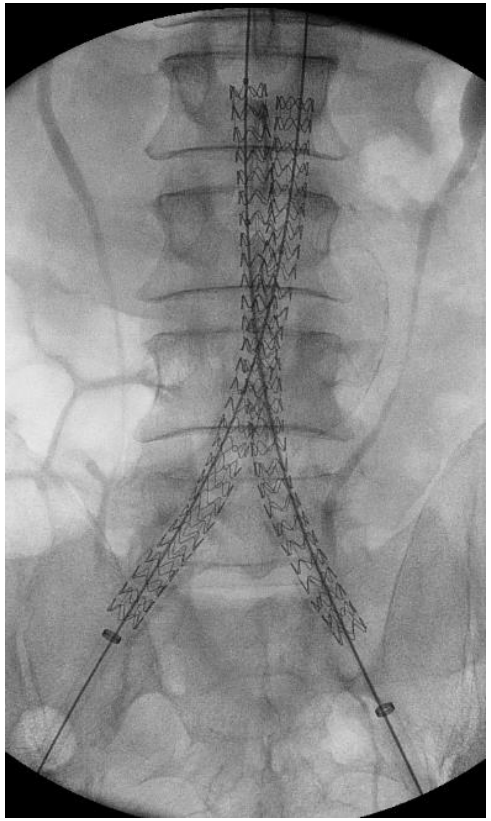
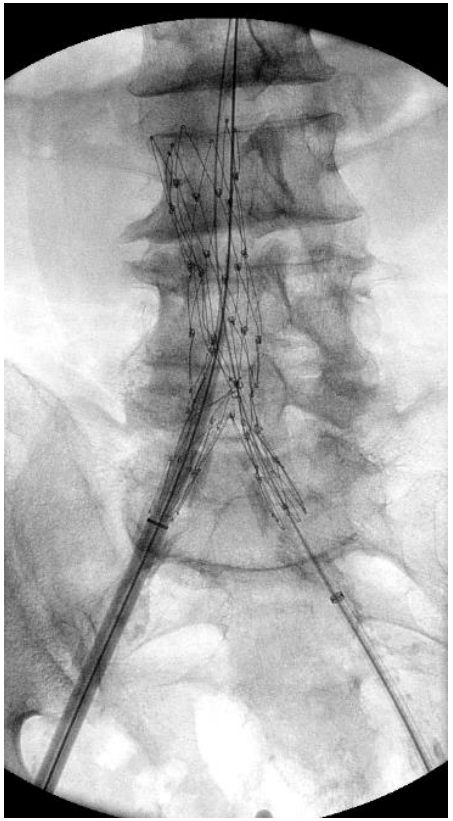
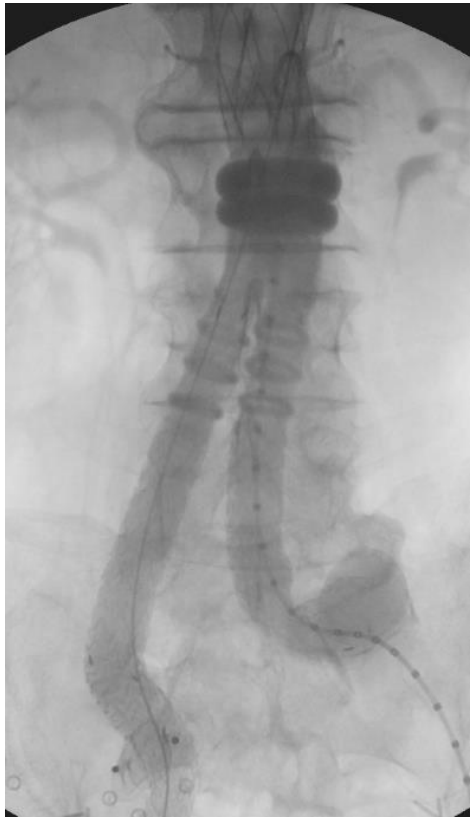
CHU Saint-Étienne

Aortic Stent Graft – Latest Generation

Low profile / Tapered tips / Better trackability







"Paving and Cracking": An Endovascular Technique to Facilitate the Introduction of Aortic Stent-Grafts Through Stenosed Iliac Arteries

Robert J. Hinchliffe, FRCS; Krassi Ivancev, MD, PhD; Björn Sonesson, MD, PhD; and Martin Malina, MD, PhD

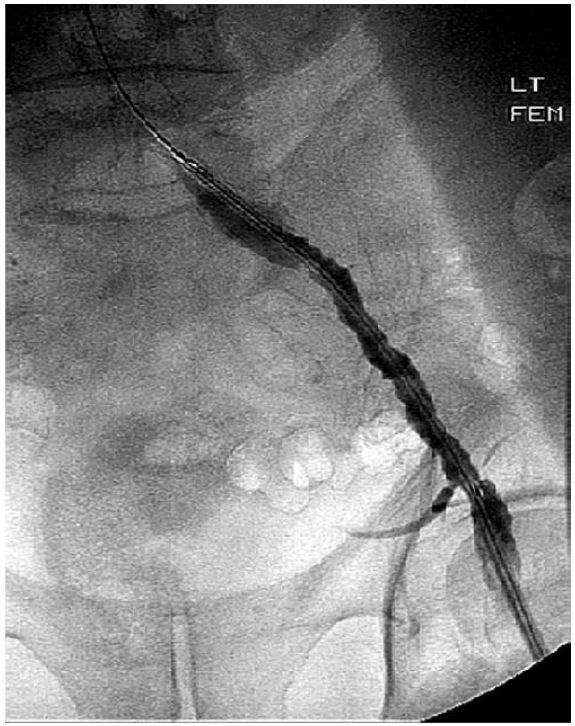
J Endovasc Ther 2007

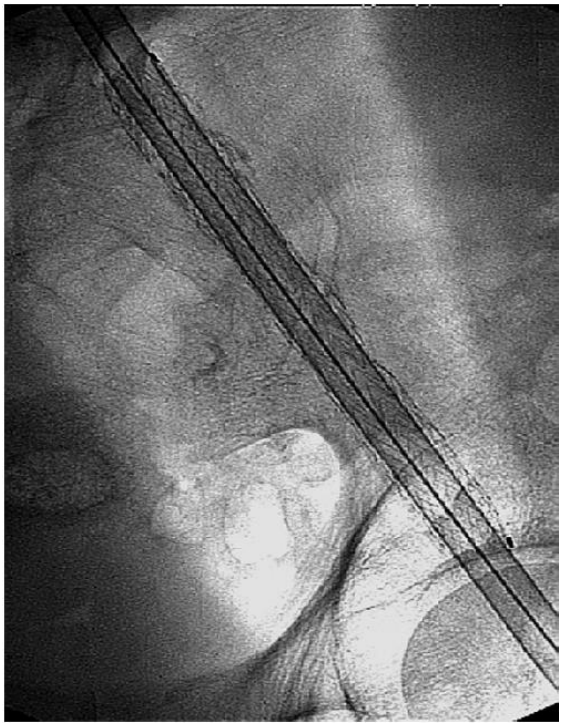
We have used "paving and cracking" successfully in patients with diffusely stenotic, calcified, and tortuous iliac arteries where other simple endovascular measures have failed. It has also proven useful in a case of iatrogenic rupture. Since we introduced this technique, we have not had to use hybrid techniques or open surgery during EVAR in patients with diseased iliac arteries. Further follow-up is required to assess the durability of this technique.

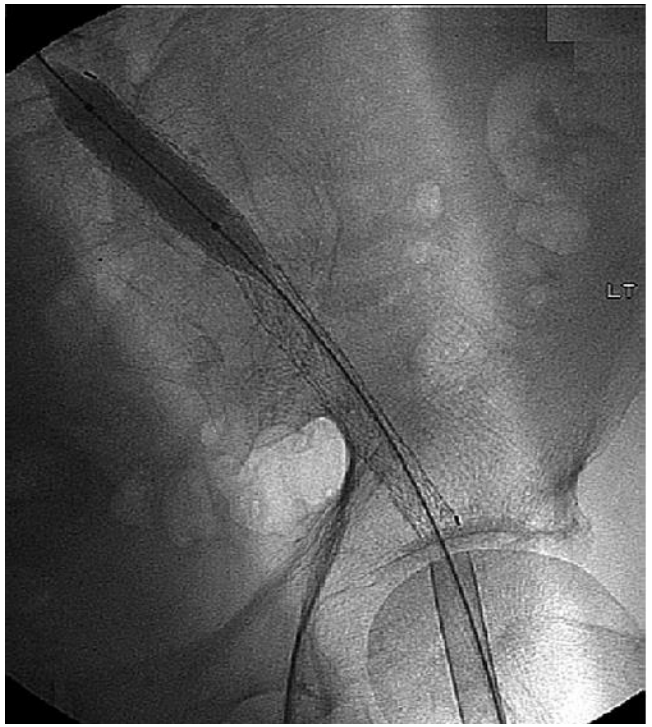
Internal endoconduit: An innovative technique to address unfavorable iliac artery anatomy encountered during thoracic endovascular aortic repair

Brian G. Peterson, MD,[a] and **Jon S. Matsumura, MD,**[b] *Saint Louis, Mo; and Chicago, Ill*

J Vasc Surg 2008







Why do we still need this « old » technique ?

DEVICES ISSUES

Fenestrated and Branched Stent Graft
Thoracic Stent Graft
Transcatheter Aortic Valve Replacement
Large Abdominal Stent Graft

Introducer diameters ***≥ 20Fr***
Outer diameter between ***7,7 and 9 mm***

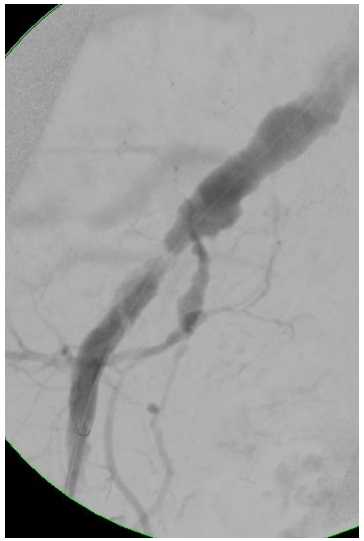
Why do we still need this « old » technique ?

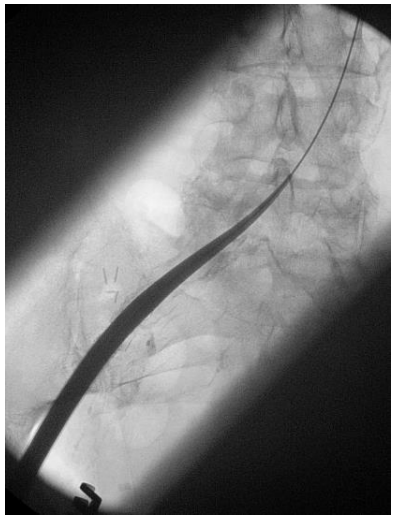
ANATOMICAL ISSUES

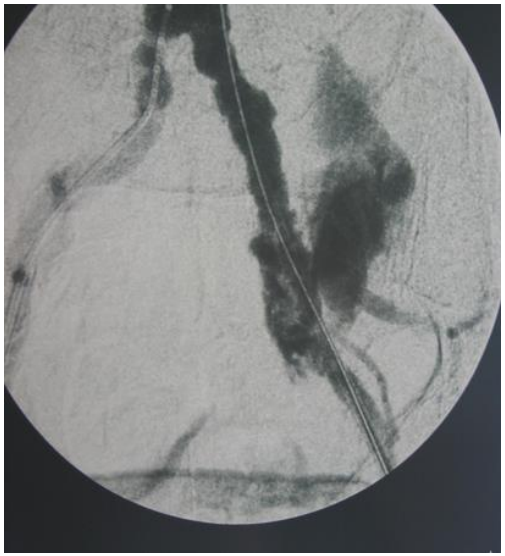
Severe iliac disease: Stenosis, calcification, tortuosity

High Risk Patients: Women, Asians, Elderly

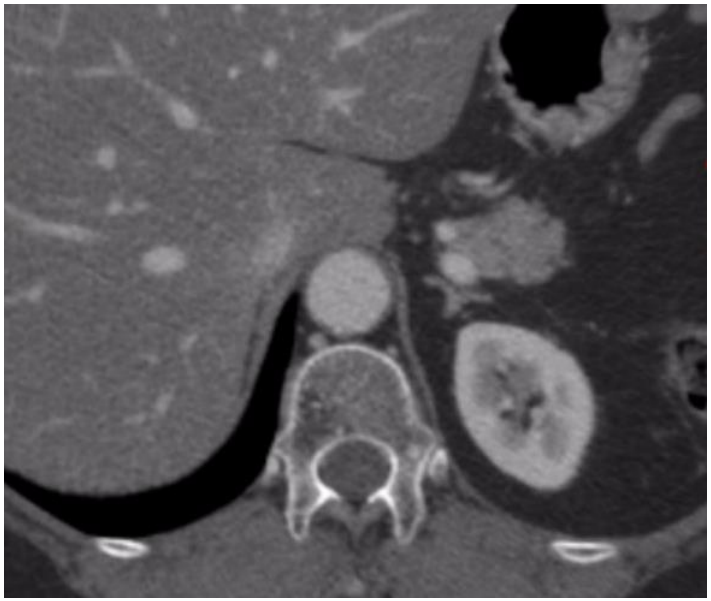
No reliable indicators to predict the impossibility to introduce an aortic stentgraft delivery system

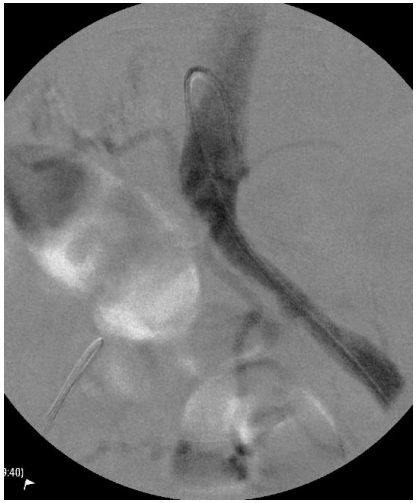


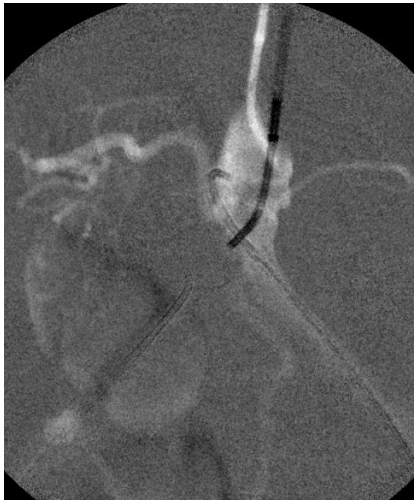


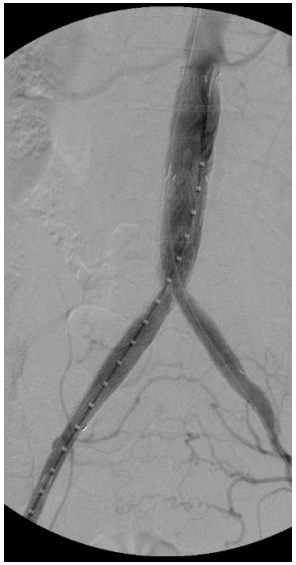


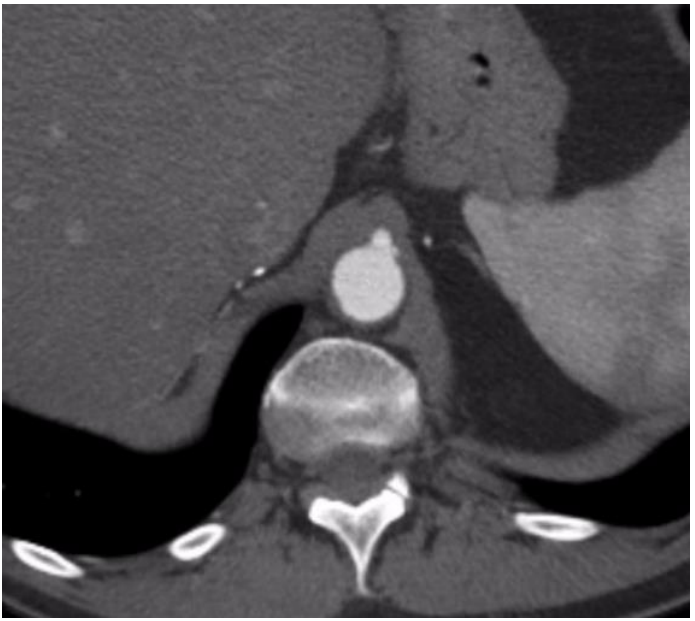
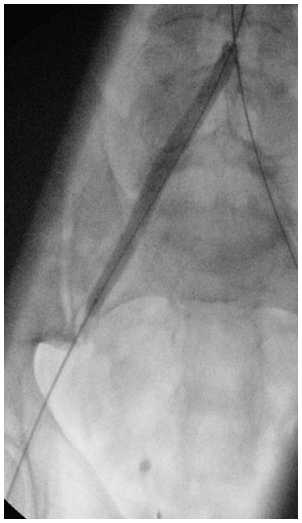
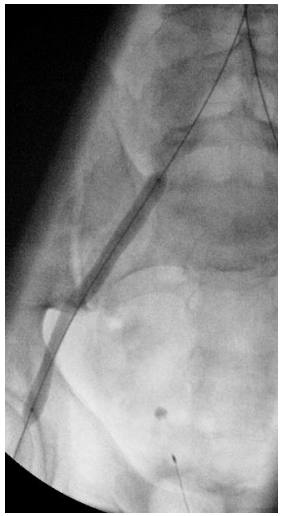
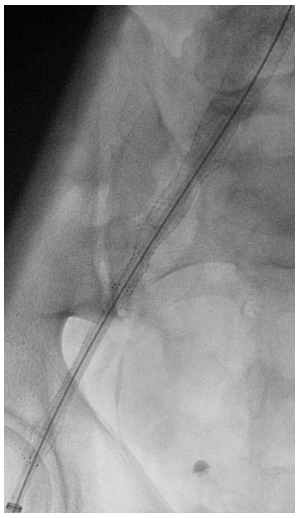
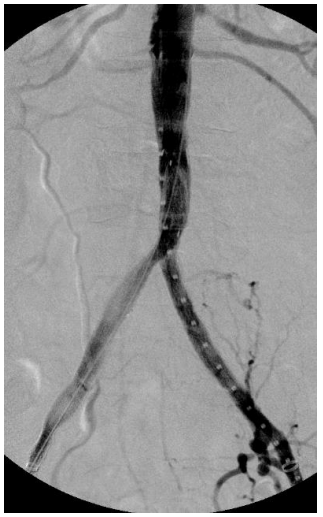
AAA with iliac occlusion









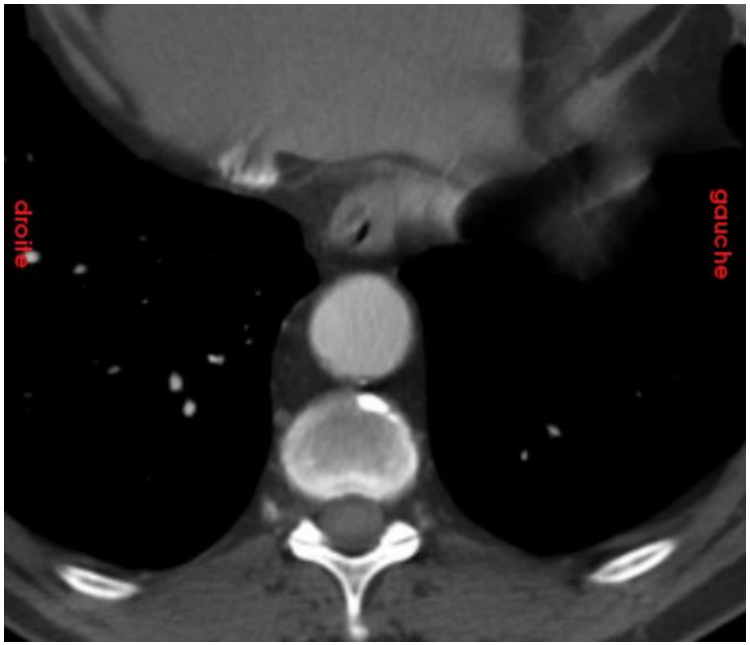






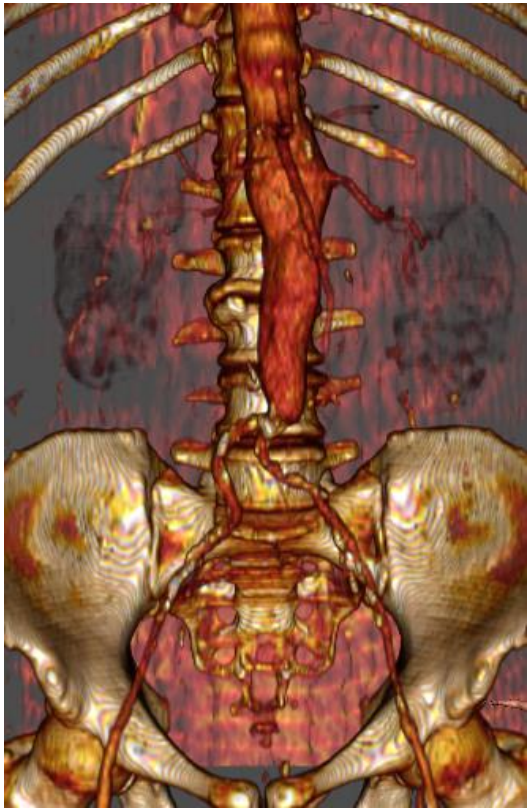
- Rare
- Technical aspects
  - Brachial access / Re-entry devices
  - Covered stents (iliac rupture)
- Reduce length of stay and complications rates
- Good midterm patency

Vallabhaneni et al. JVS 2012

Branched and Fenestrated Stent Graft

Requires 2 large diameter introducer sheath (≥20 Fr)

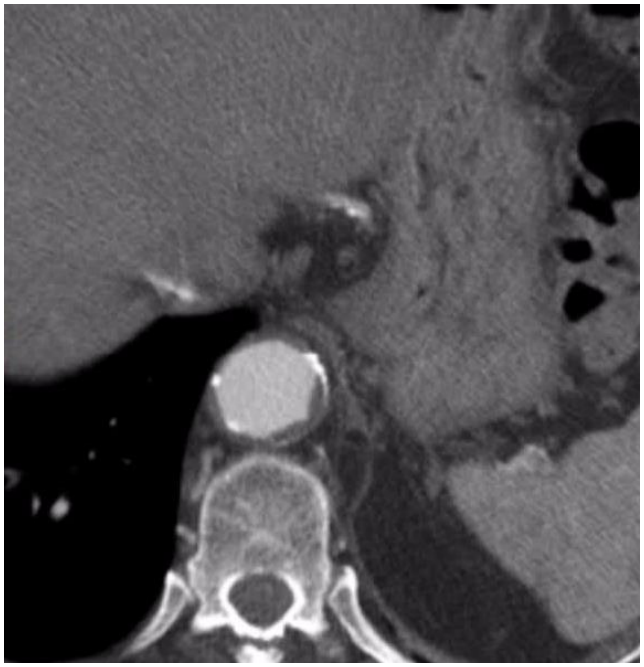


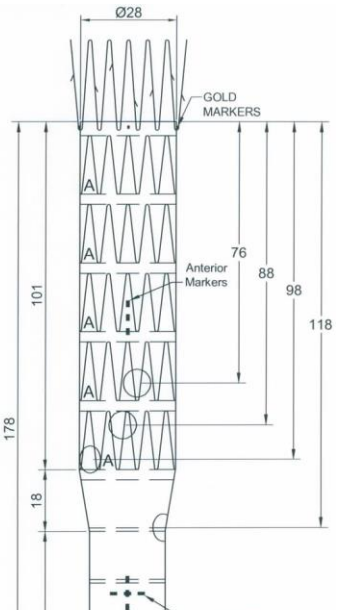


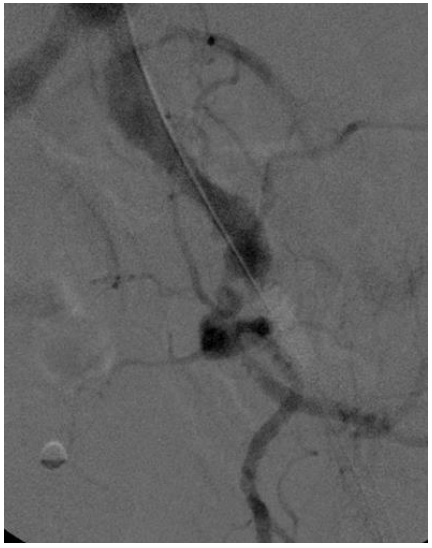
Personal experience
89 patients

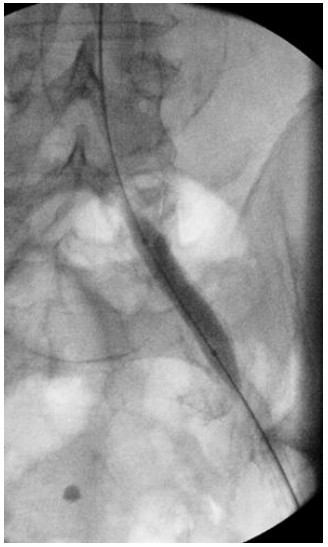
12 (13%) required adjunctive procedure to improve iliac access

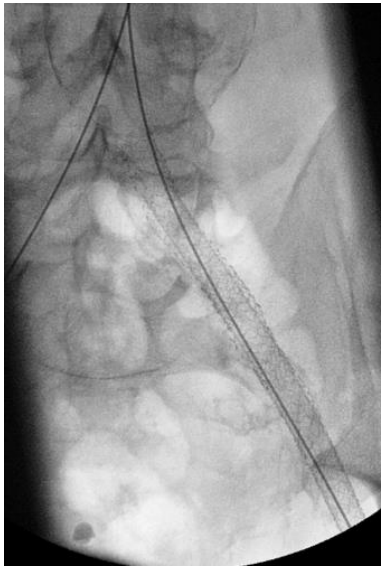
Juxta renal AAA with poor iliac access

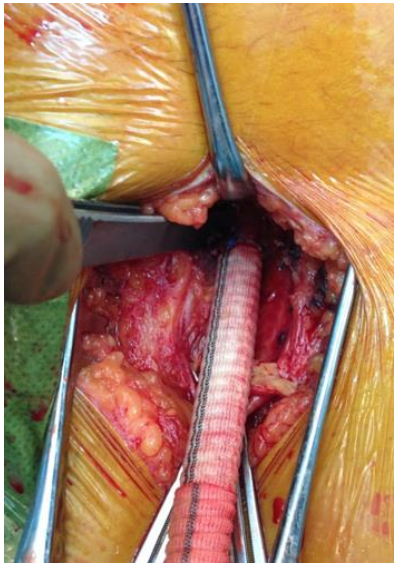


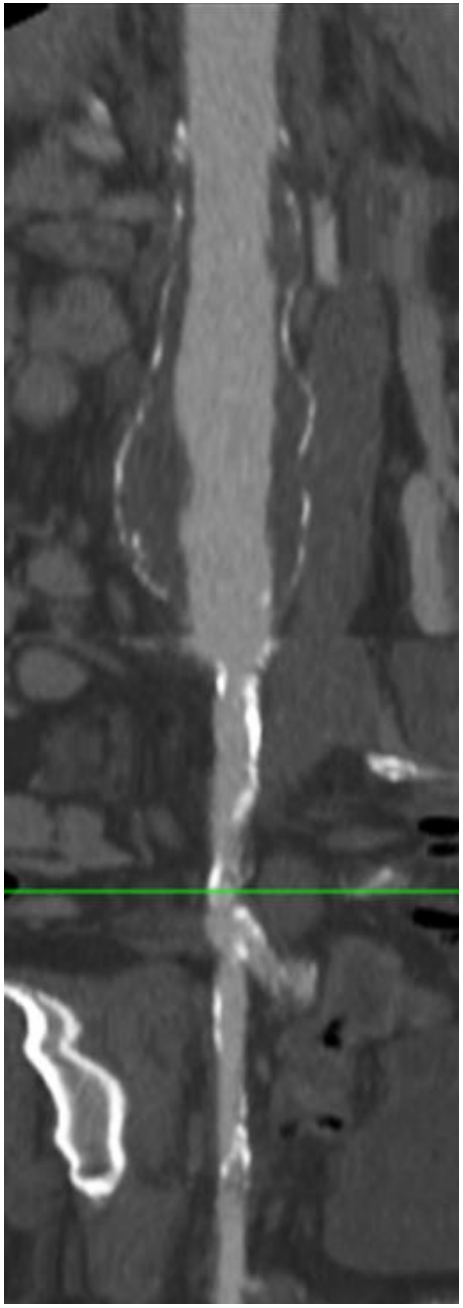


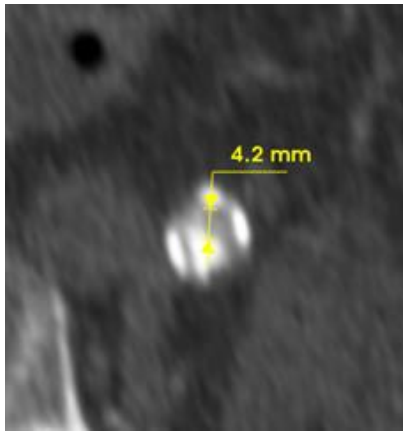








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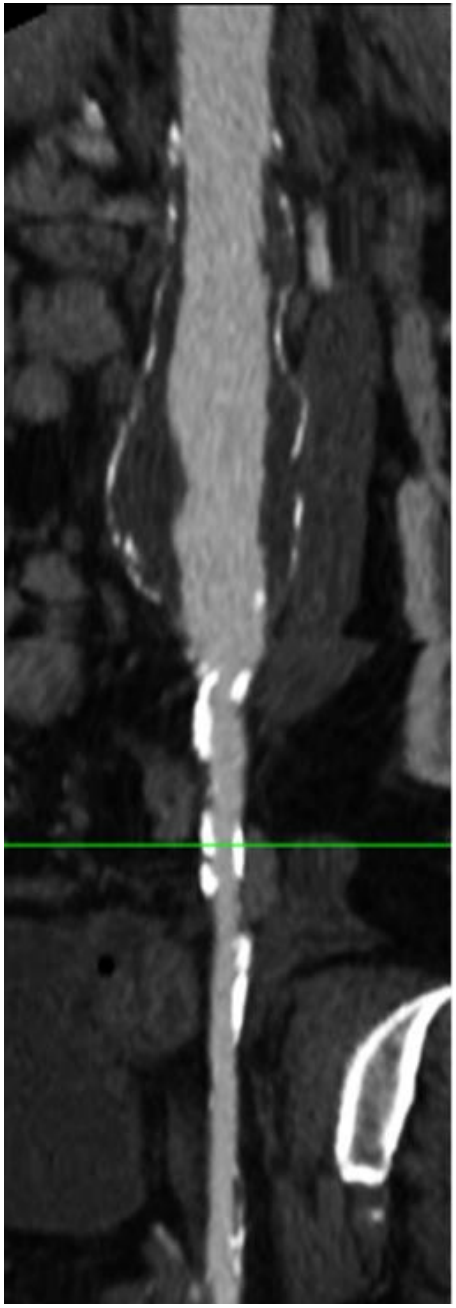

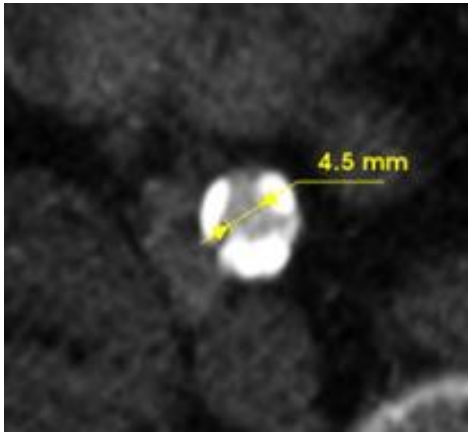
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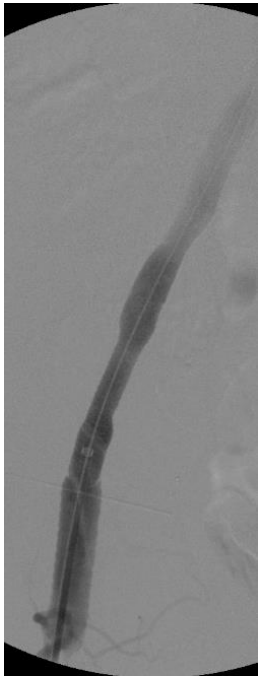

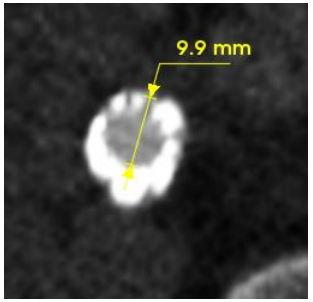
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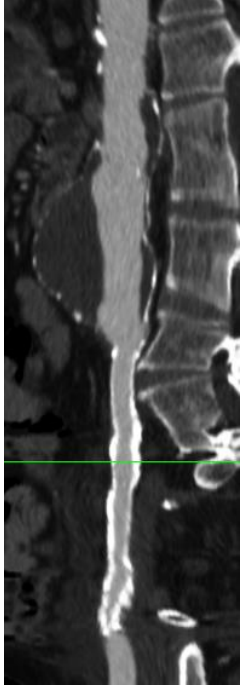

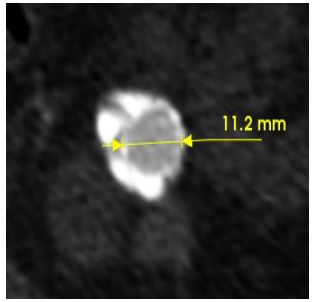
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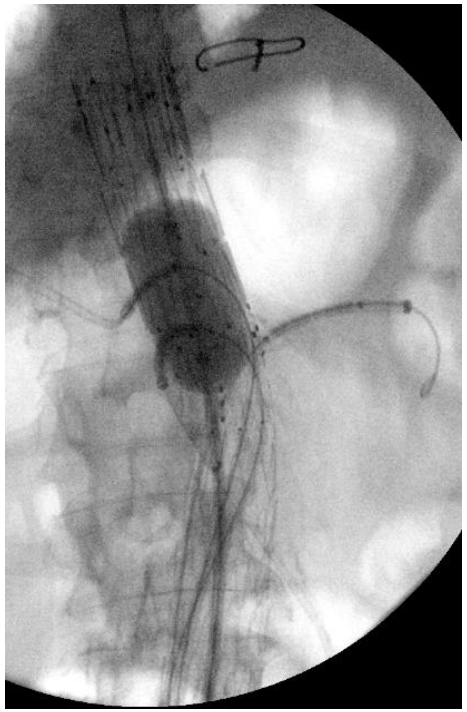

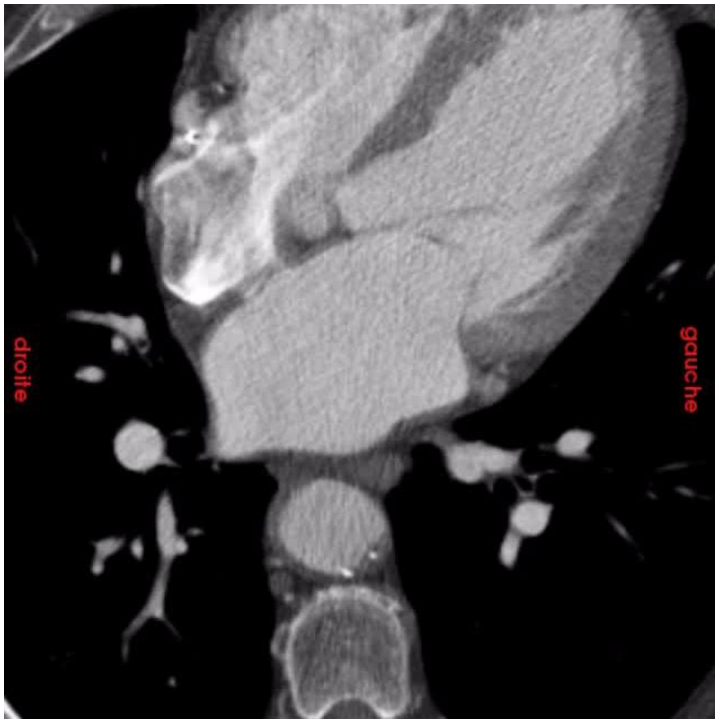
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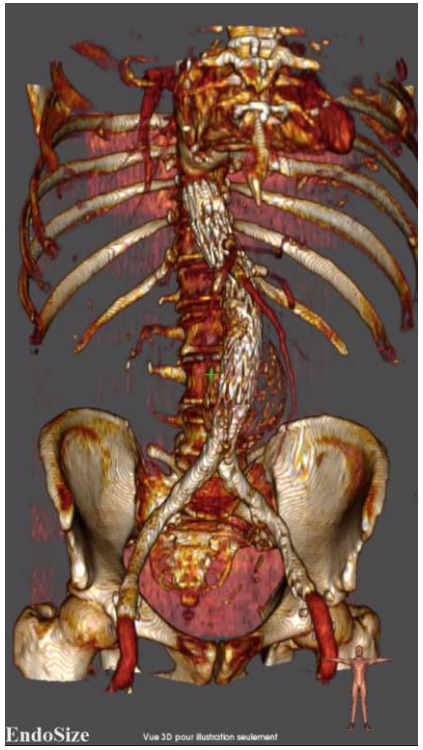
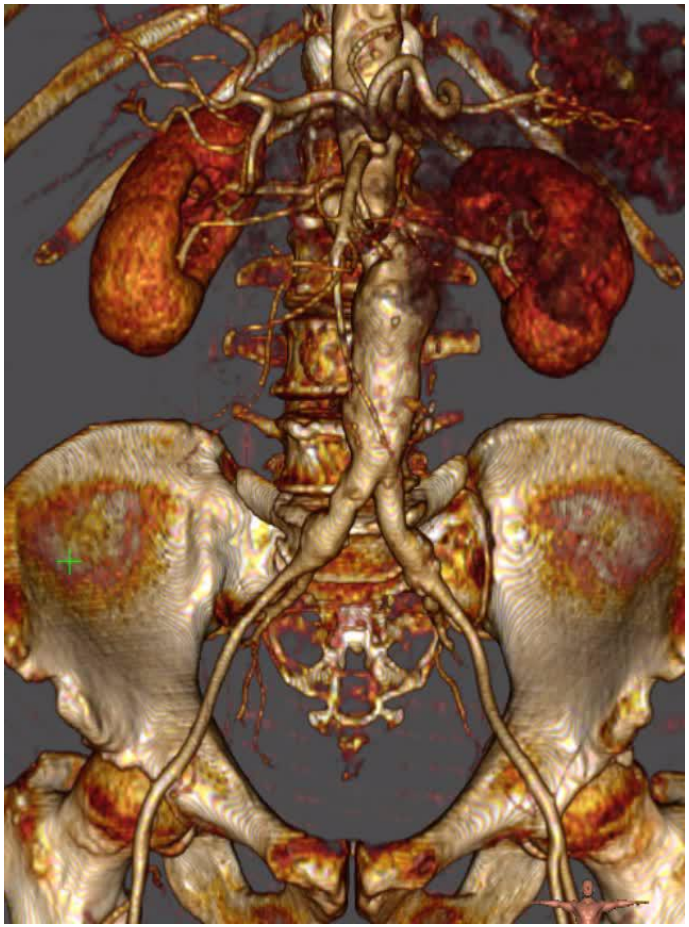
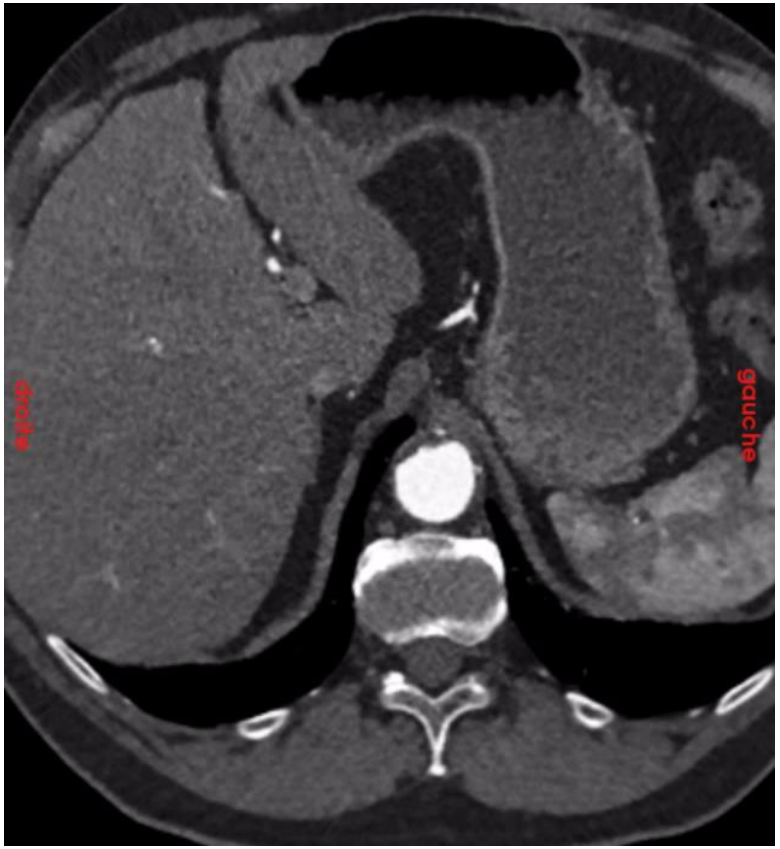

EndoSize
Vue 3D pour illustration seulement

Juxta renal AAA with poor iliac access





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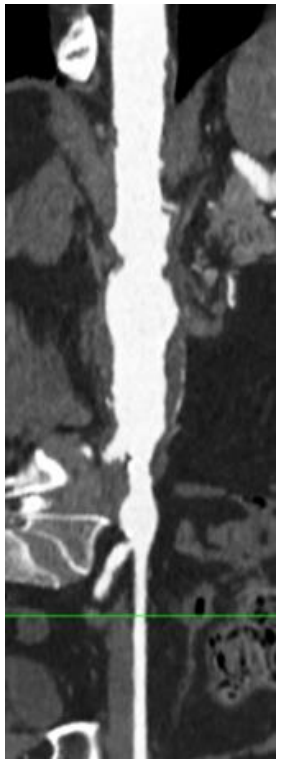

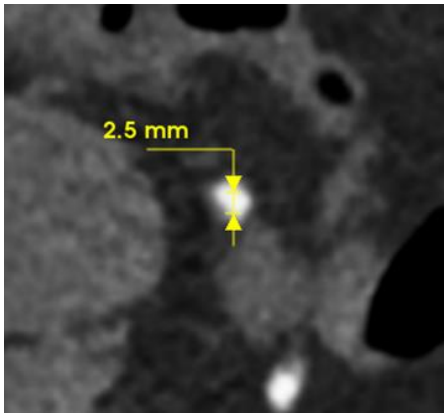

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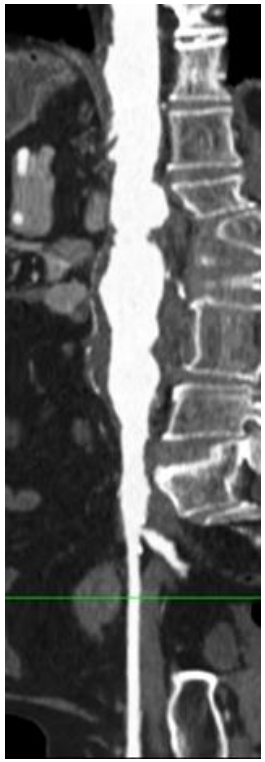

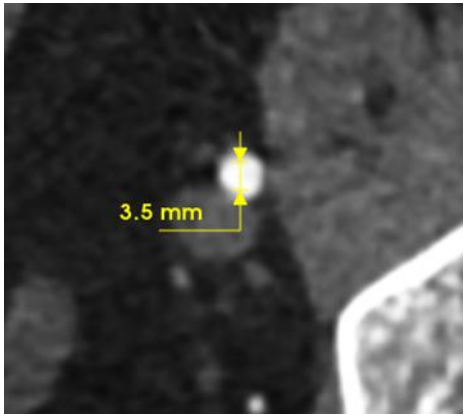

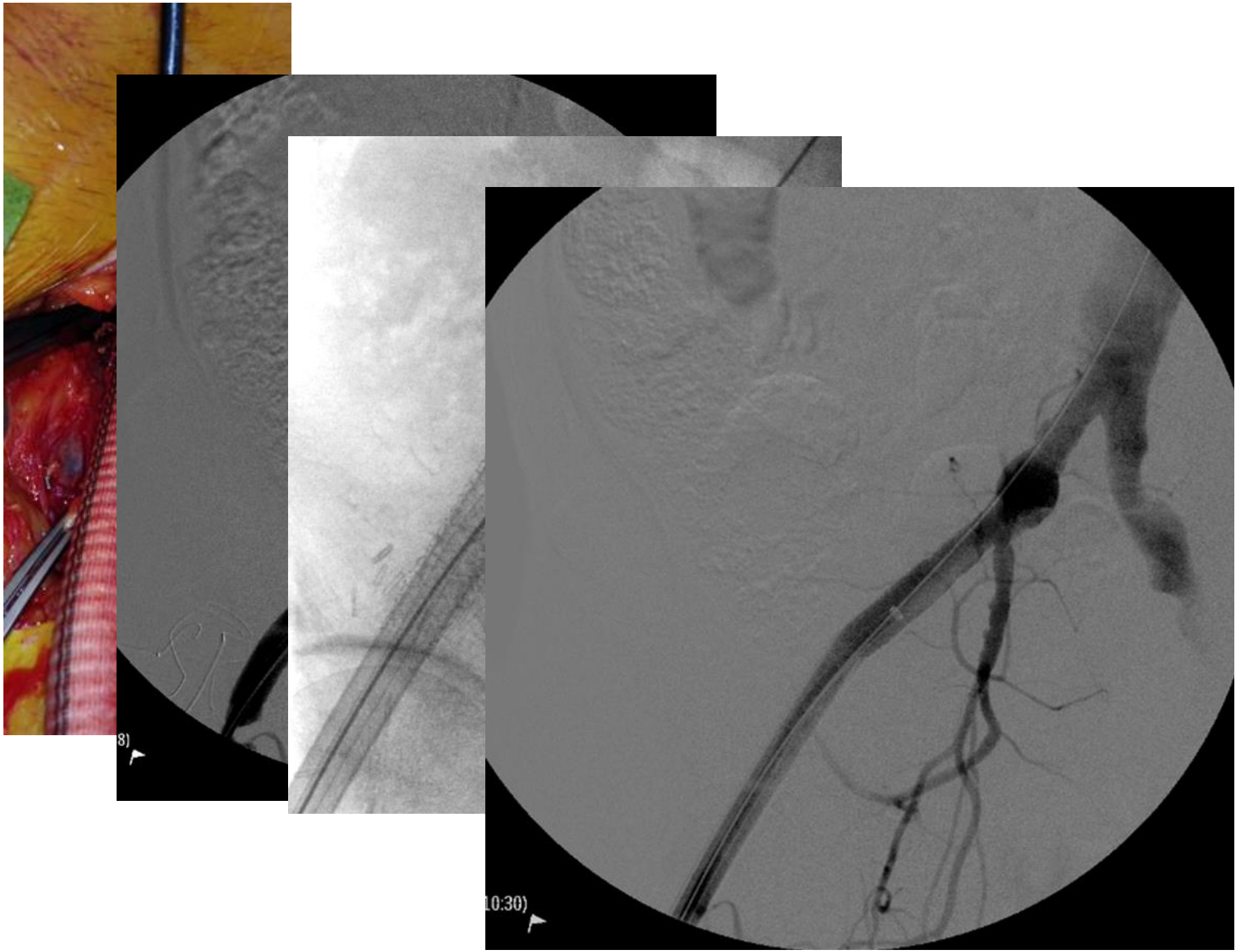

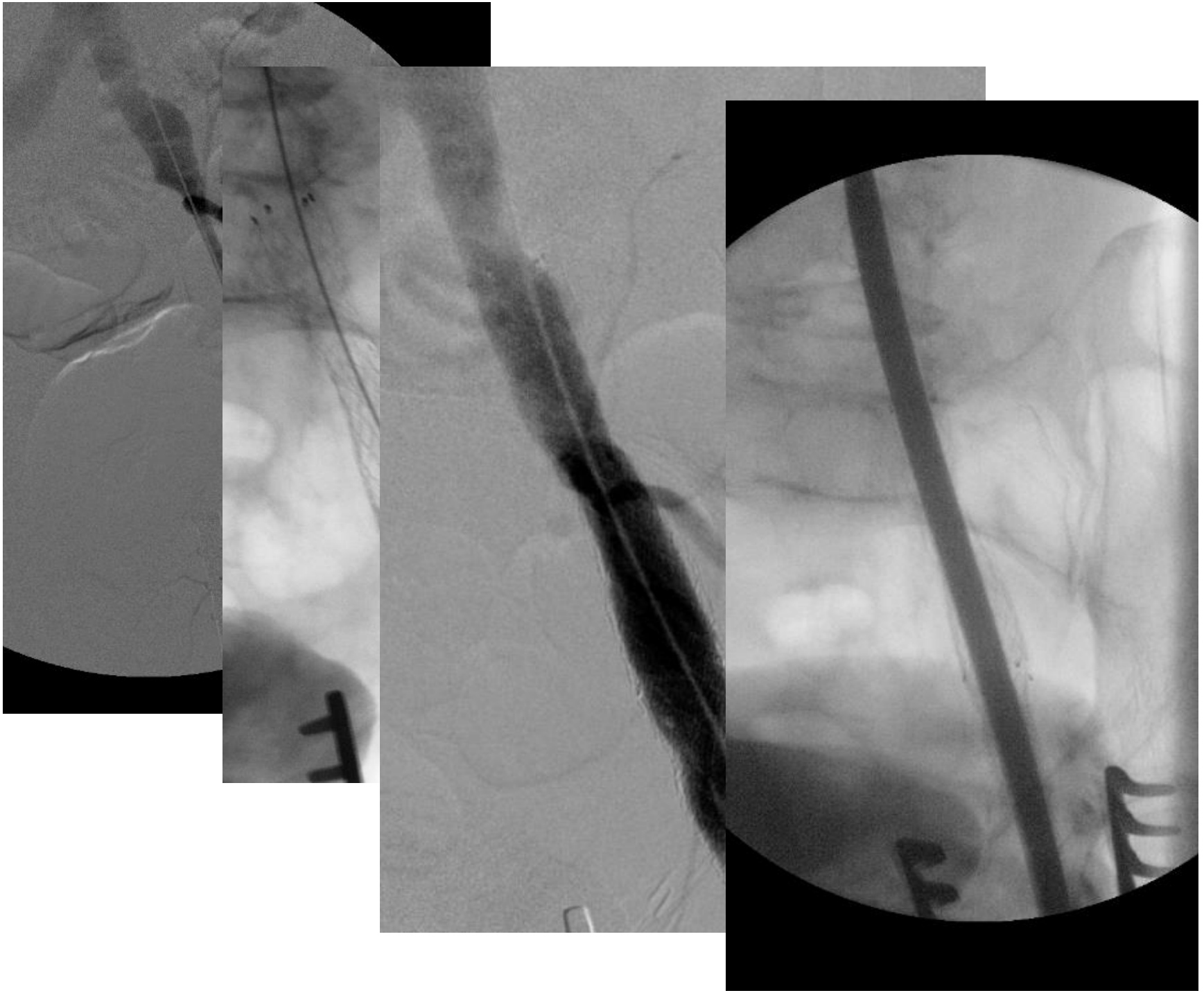

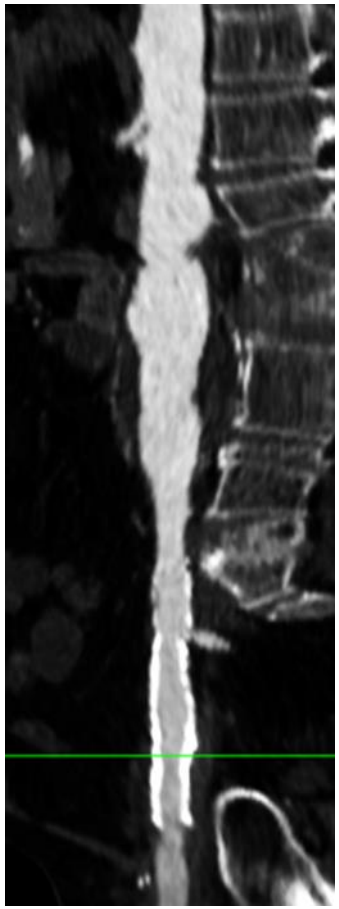

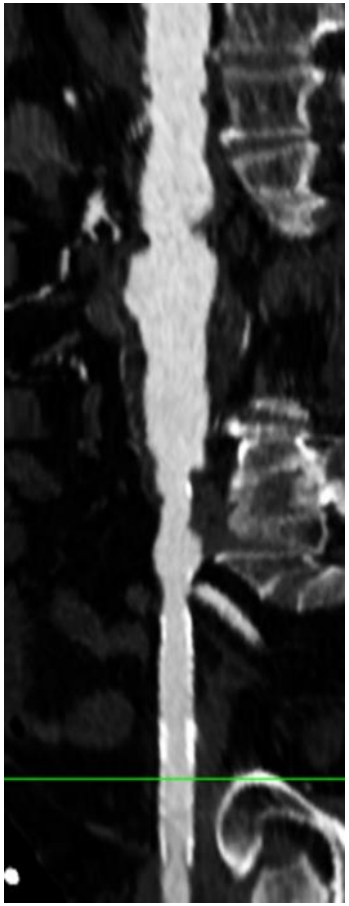

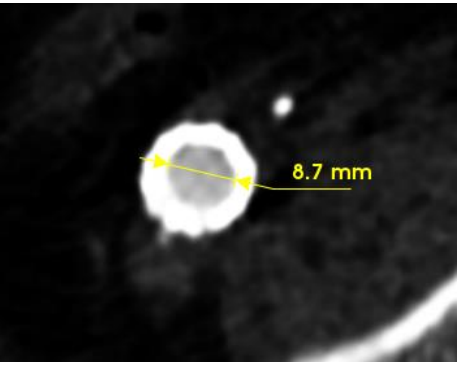
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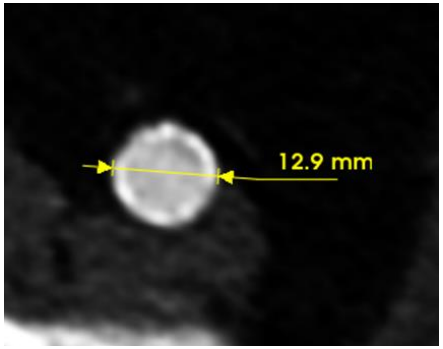
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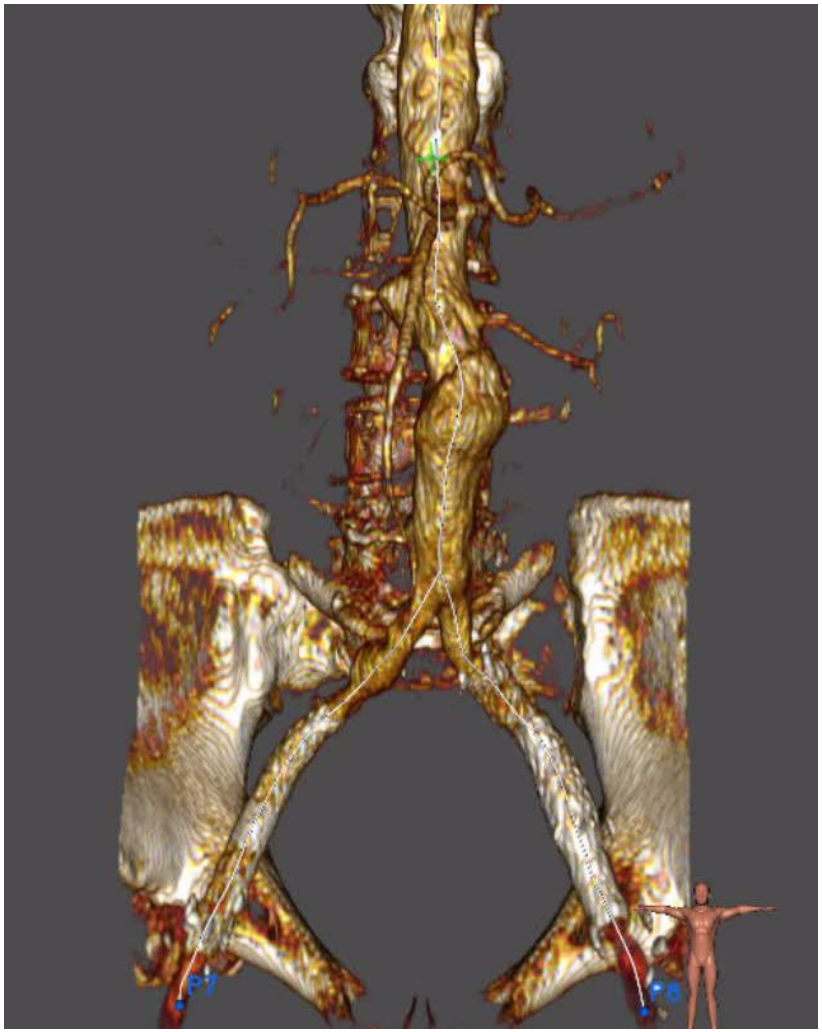
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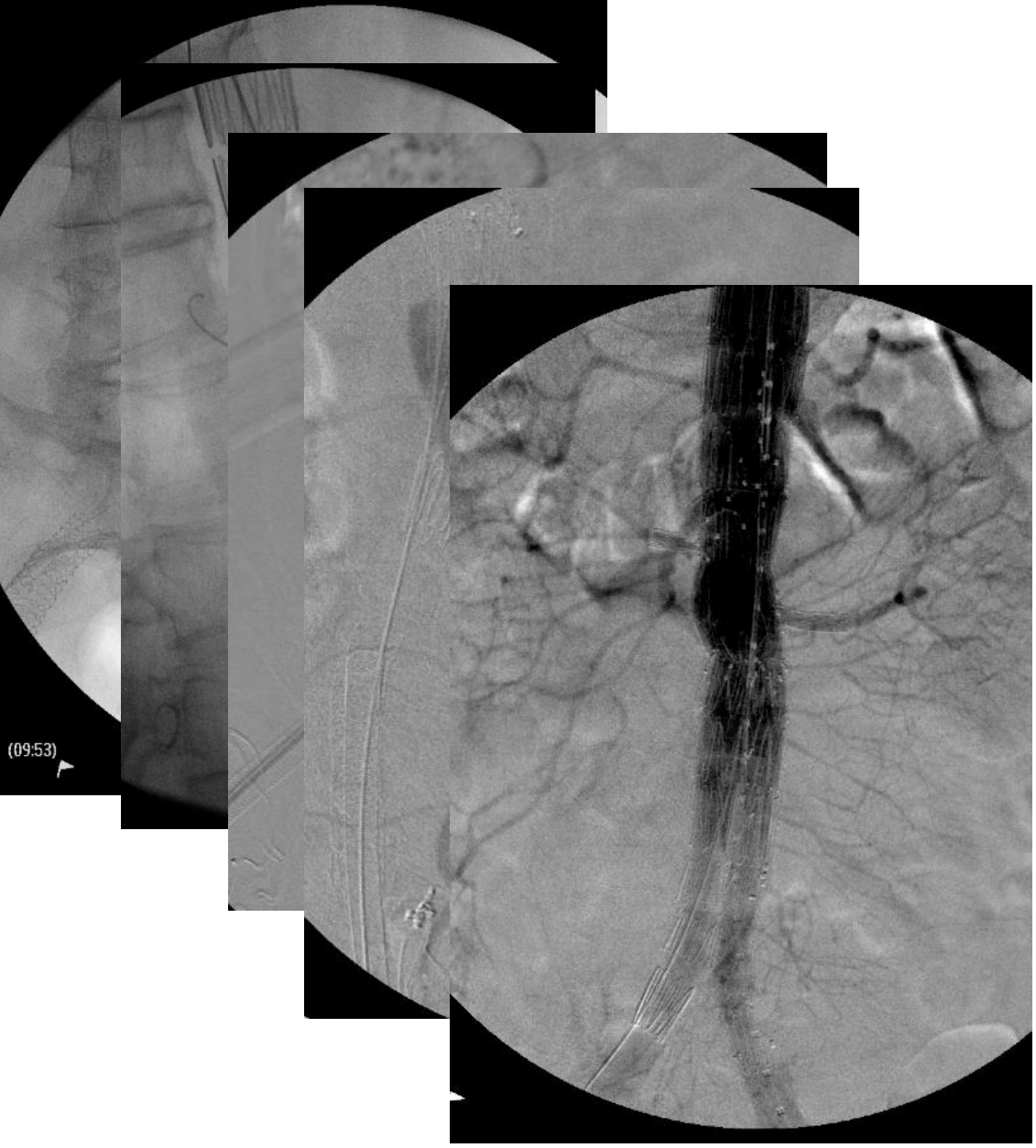
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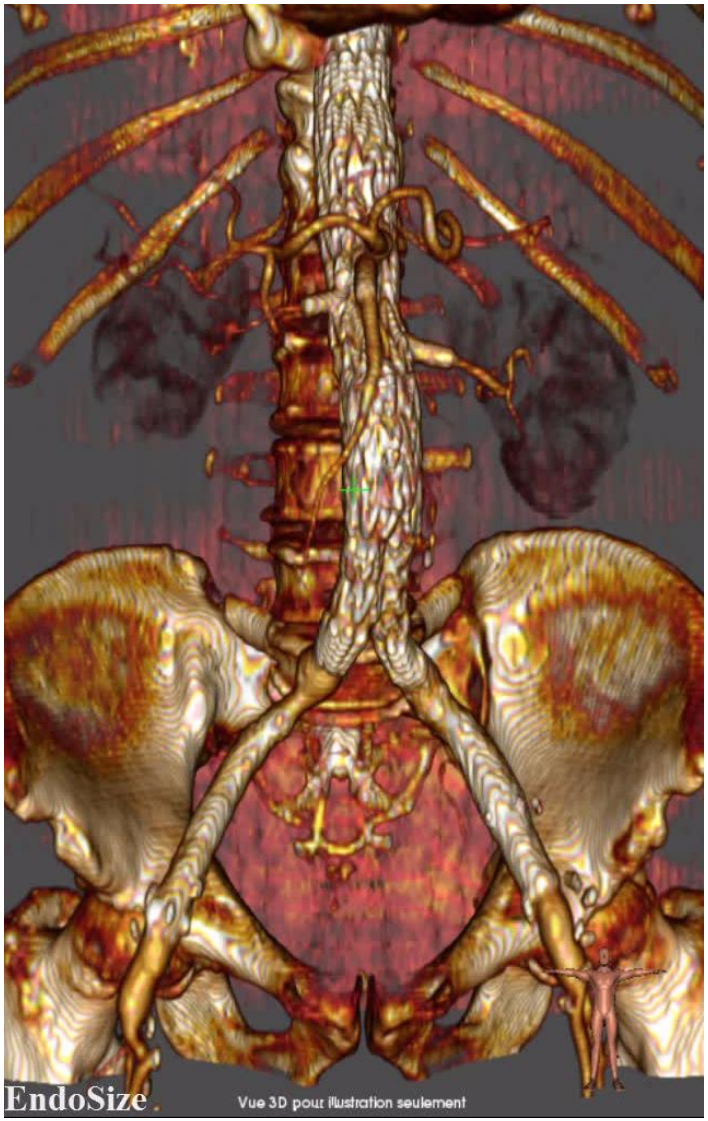
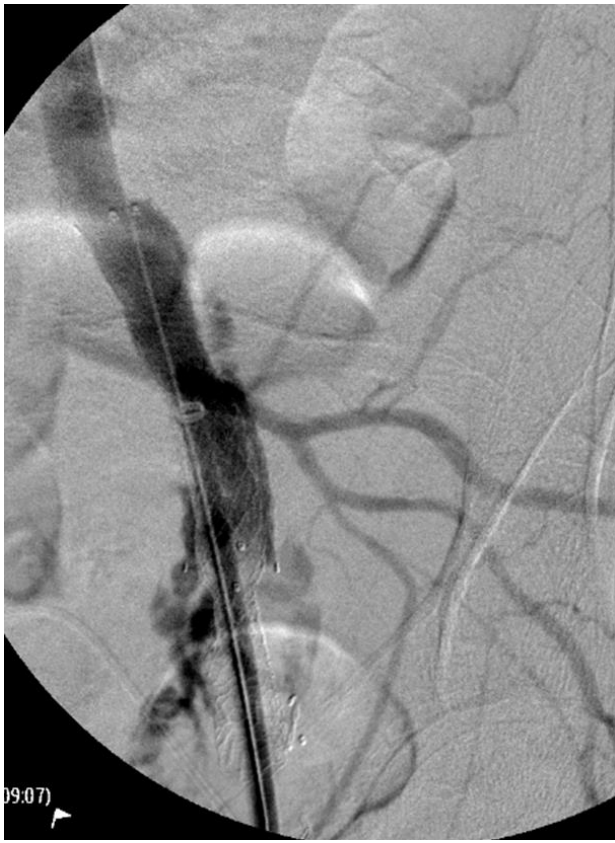

EndoSize
Vue 3D pour illustration seulement

Lessons Learned

- **Thinking before cracking !**
  - High risk of rupture at the hypogastric origin
  - High risk of rupture at the common femoral artery

- **Preservation of hypogastric perfusion**
  - Large self-expandable stent may preserve perfusion and decrease the risk of rupture

- In case of iliofemoral lesion or CFA<6mm : short direct fem-fem bypass



Alternatives

- **AUI Stent Graft + cross over fem-fem bypass**

  Requires 1 iliac access

  Decreases patency, risk of femfem graft infection

- **Hybrid strategies**:

  Iliofem or aortofem bypass / Iliac conduits

  Retroperitoneal incision,

  higher complications rates and length of stay

Guido et al. JVS 2014
Tsilimparis et al. EJVES 2013
Lee et al. JVS 2003

- **Chimney Techniques using Low Profile Stent Graft**

Massmann et al. CIRSE 2014

Conclusions

- Preoperative planning +++

- In high risk patients
  - with severe iliac disease
  - with high risk of impossibility to introduce the delivery system

PAVING-CRAKING IS STILL A USEFUL TECHNIQUE