UNIVERSITY OF TORONTO

UHN Toronto General Toronto Western Princess Margaret Toronto Rehab

MOUNT SINAI HOSPITAL
Joseph and Wolf Lebovic Health Complex

CIRA Case of the Week
February 2016

Case Courtesy of Drs. Maxime Noel-Lamy and K.T. Tan
University of Toronto

Case

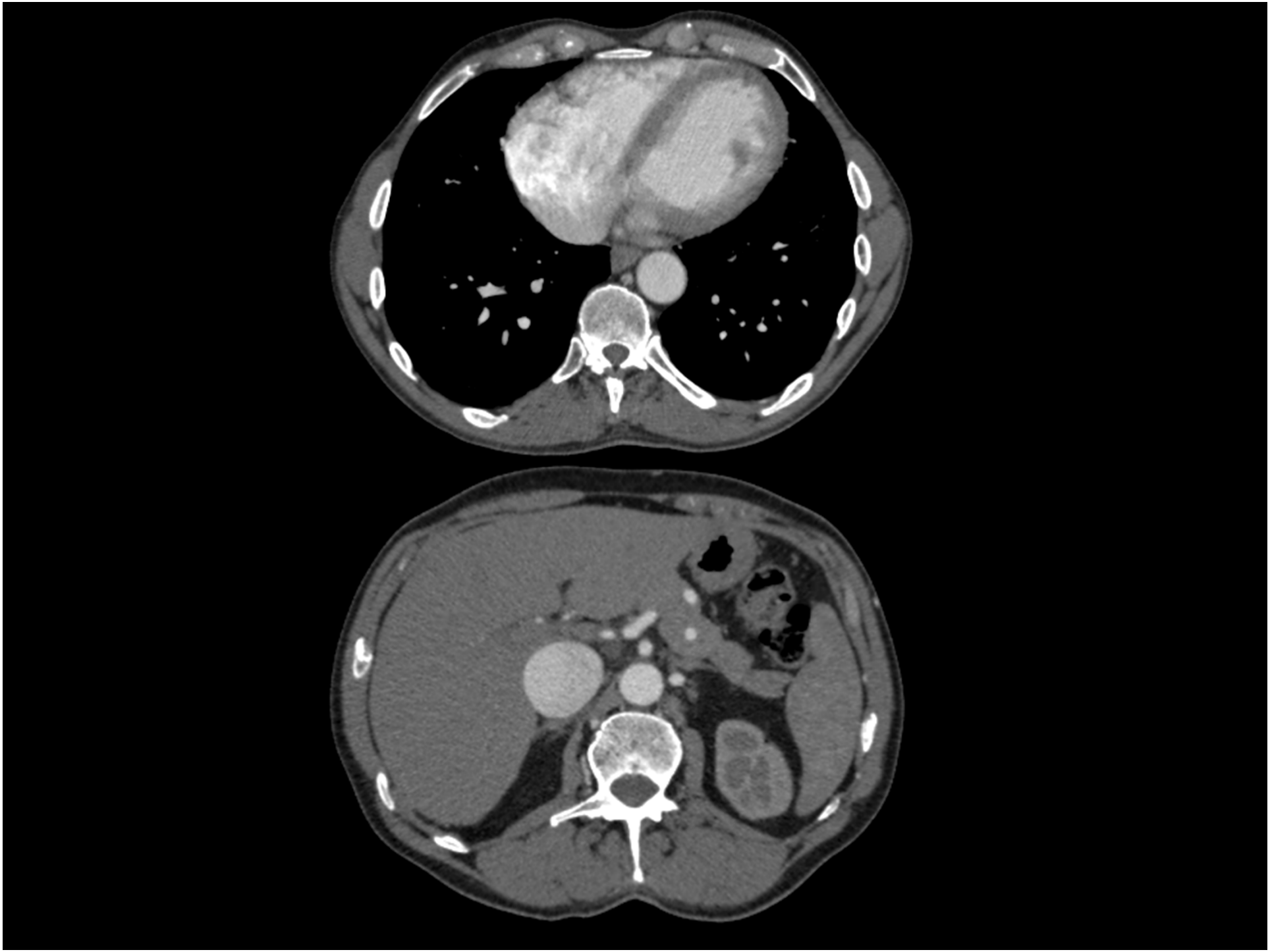
- 62 year-old male
- Presents to family physician with 4-year history of worsening dyspnea
- Medication: aspirin, crestor
- Non-smoker, no hypertension or diabetes
- Past-medical history:
  - Endovenous laser venous ablation (EVLT) of the right greater saphenous vein (GSV) 4 years earlier

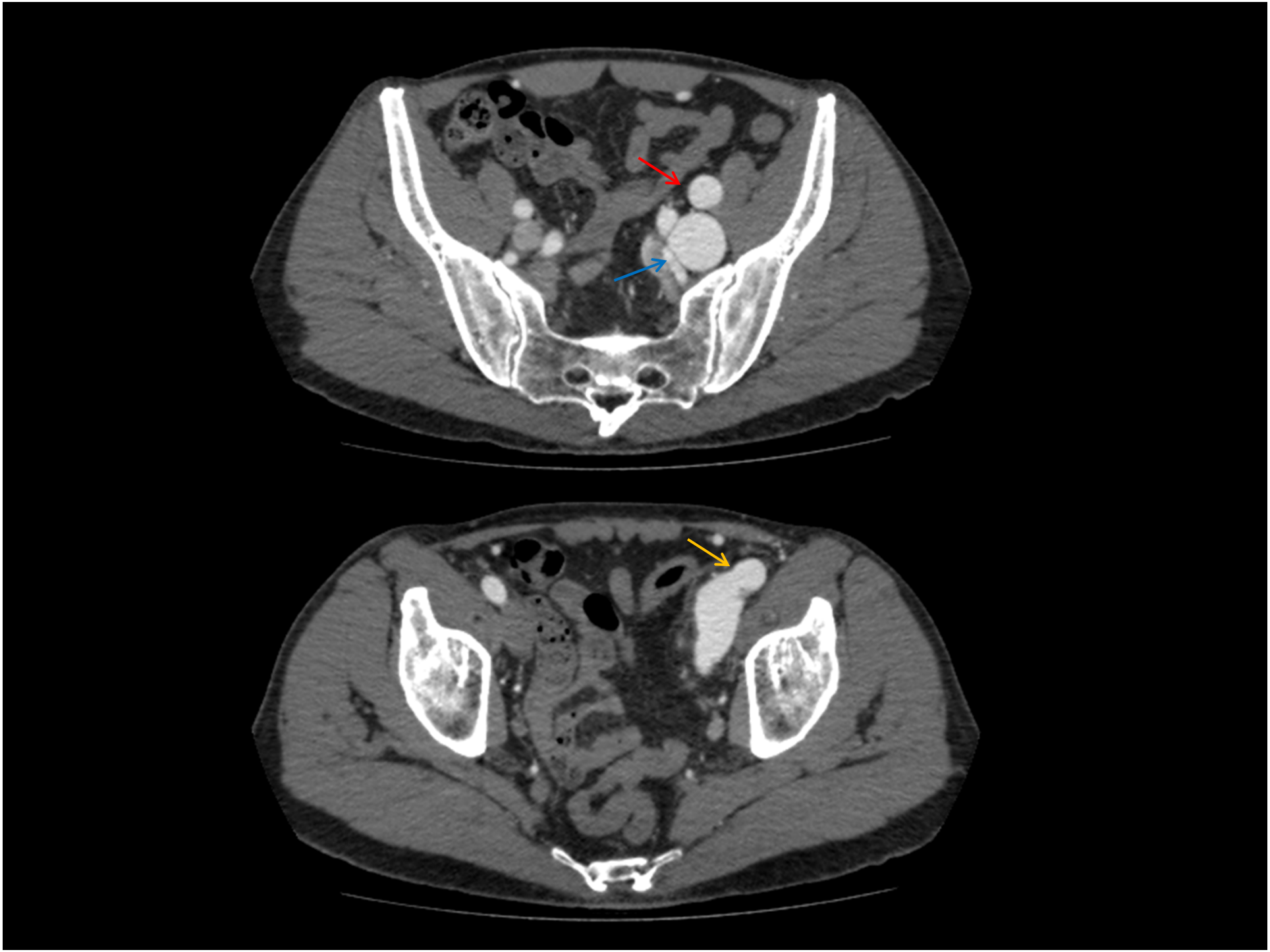
Case

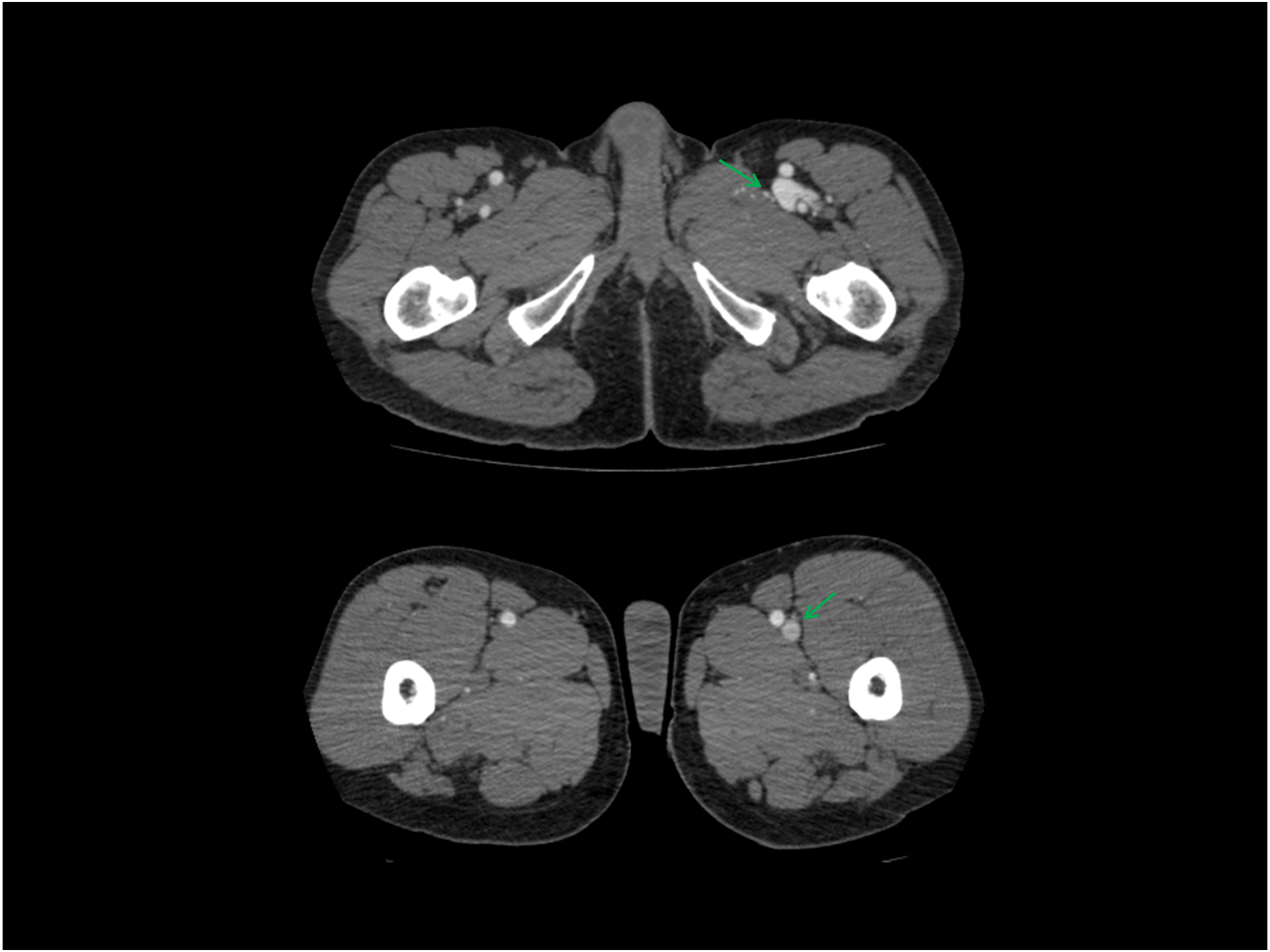
- Physical exam:
  - End-inspiratory crackles at lung bases
  - Mild jugular distension
  - Palpable thrill in the right groin
- Echocardiogram:
  - Left ventricular hypertrophy

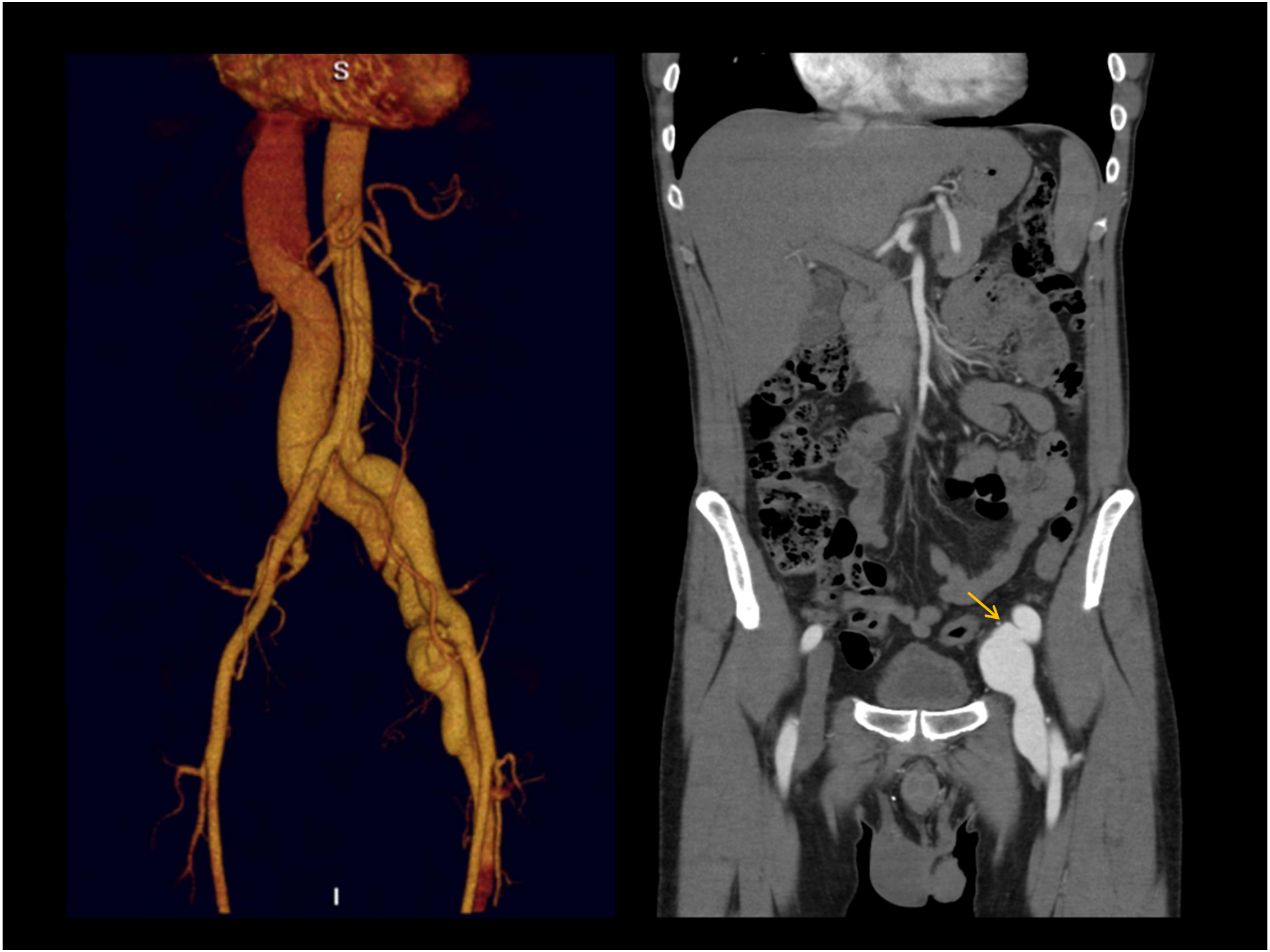
Case

- Patient was referred to a vascular surgeon
- Right iliac arterio-venous fistula (AVF) was suspected on the basis of the physical exam and symptoms
- Abdominal CTA was ordered





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Findings

- 12 mm wide arterio-venous fistula (AVF)
  - Distal external iliac artery (EIA) - external iliac vein (EIV)
  - Close to the level of the inguinal ligament
- Dilatation of the left common iliac vein and IVC
- Dilatation of the left common iliac artery
- *AVF thought to be iatrogenic, 2nd to EVLT*
- High-output cardiac failure

1st treatment: surgical

- Different treatment options were evaluated, but patient preferred a surgical treatment
- Performed under general anesthesia
  - Cardiac output at induction: 12 L/min
- Exposure of EIA and EIV
- A dime size hole between EIA and EIV was seen, just proximal to the CFA
- Fistula was ligated and the EIA was patched
- No immediate complication
- Discharged after 3 days

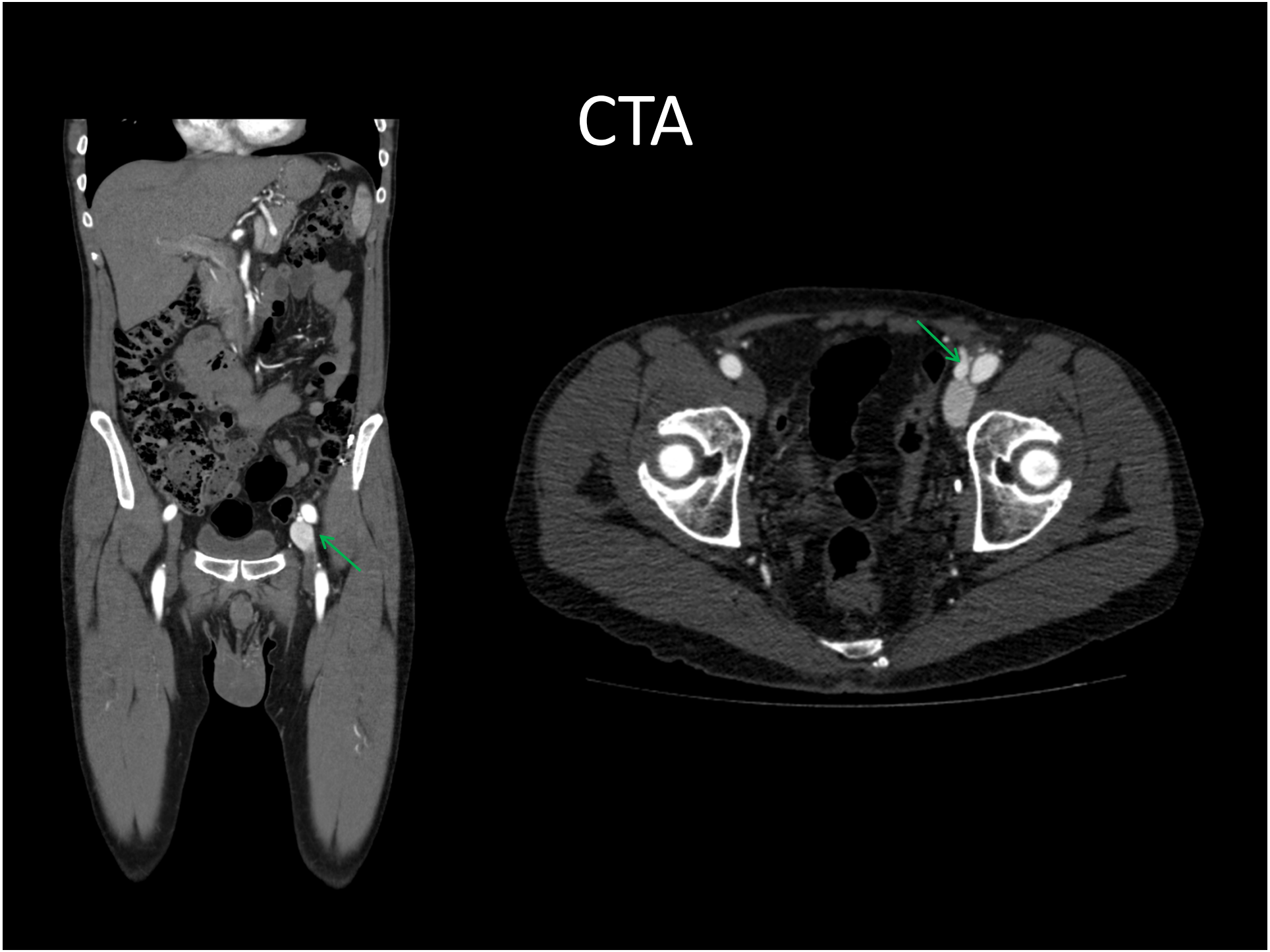
Post-surgery

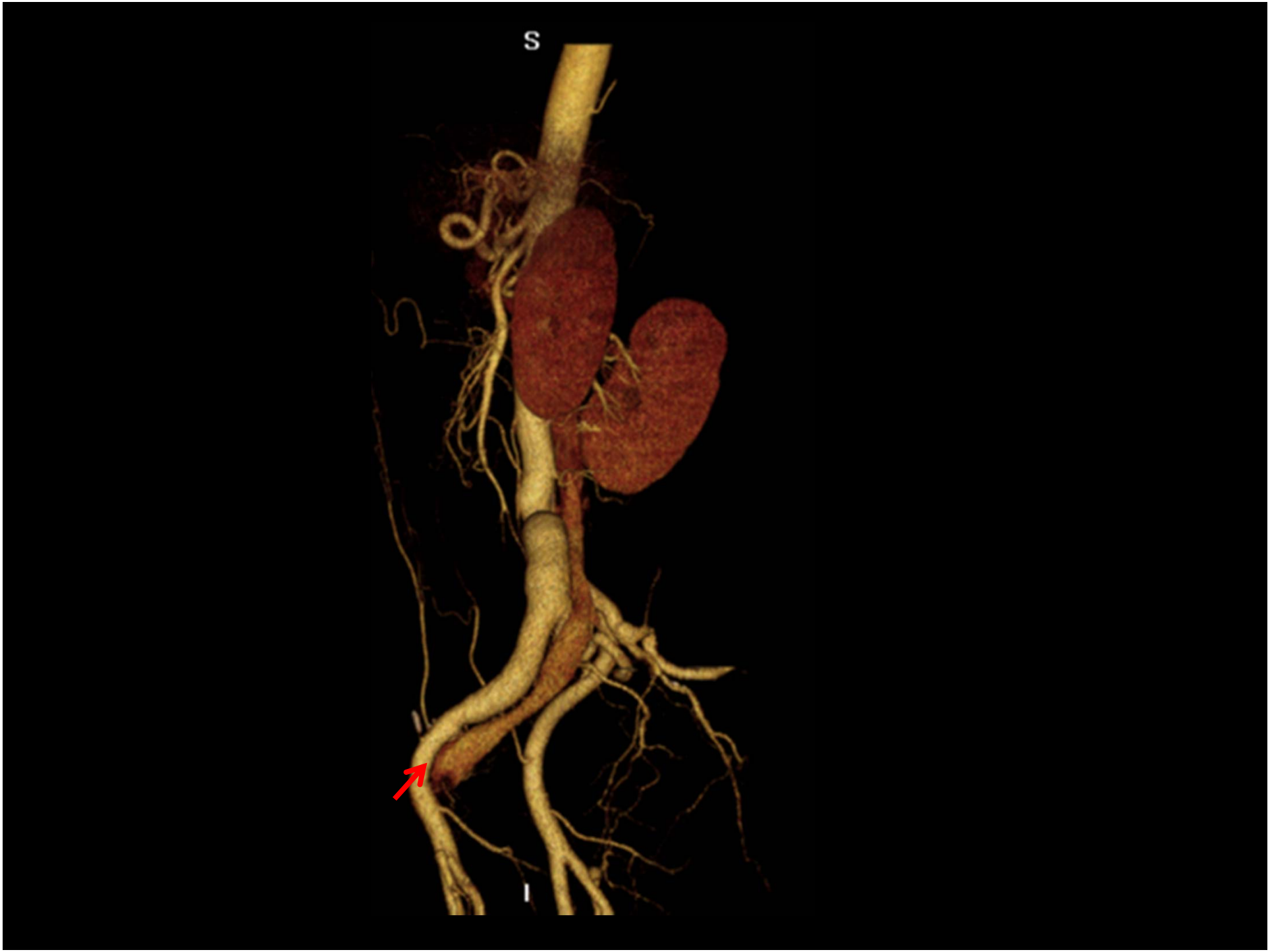
- Patient was put on Warfarin for 4 months
  - For risk of thrombosis in dilated veins with reduced flow
- 6-month clinic visit: AVF closed on doppler US, no bruit, dyspnea improved

1-year post

- Recurrence of a loud bruit in the left groin
- Doppler US: AVF has re-opened
- Probably 2nd to failed patch or tearing of suture
- CTA ordered

CTA

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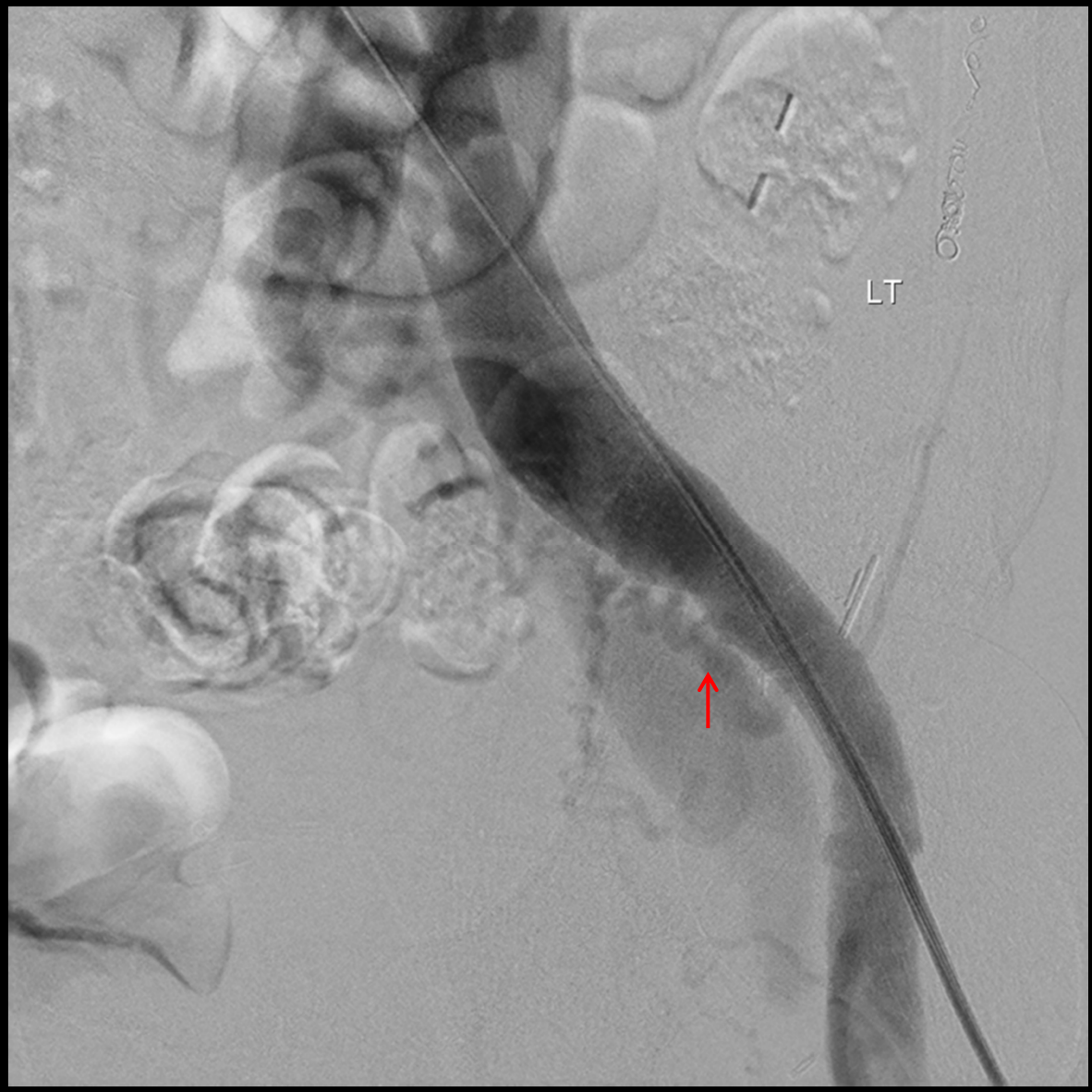
Findings

- Recurrence of the AVF at the same site
- Diameter of the hole: 3mm
- Diameter of the EIA at level of fistula: 10mm
- Diameter of the EIV at level of fistula : 20mm
- Considering failed surgical treatment, an endovascular treatment was performed

Procedure

- Under conscious sedation
- Left CFA retrograde access – 6 Fr sheath
- Right CFV retrograde access – 7 Fr sheath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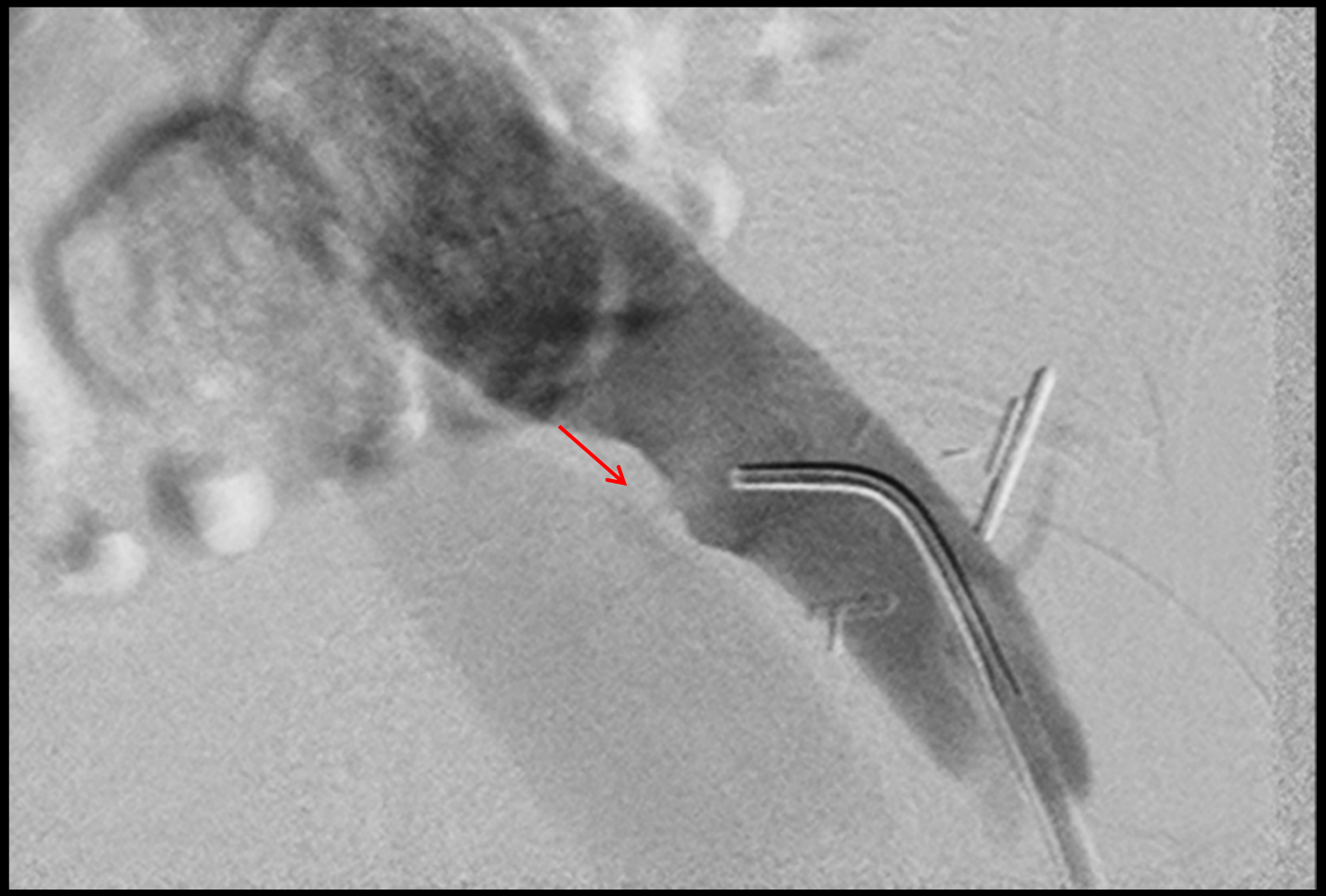
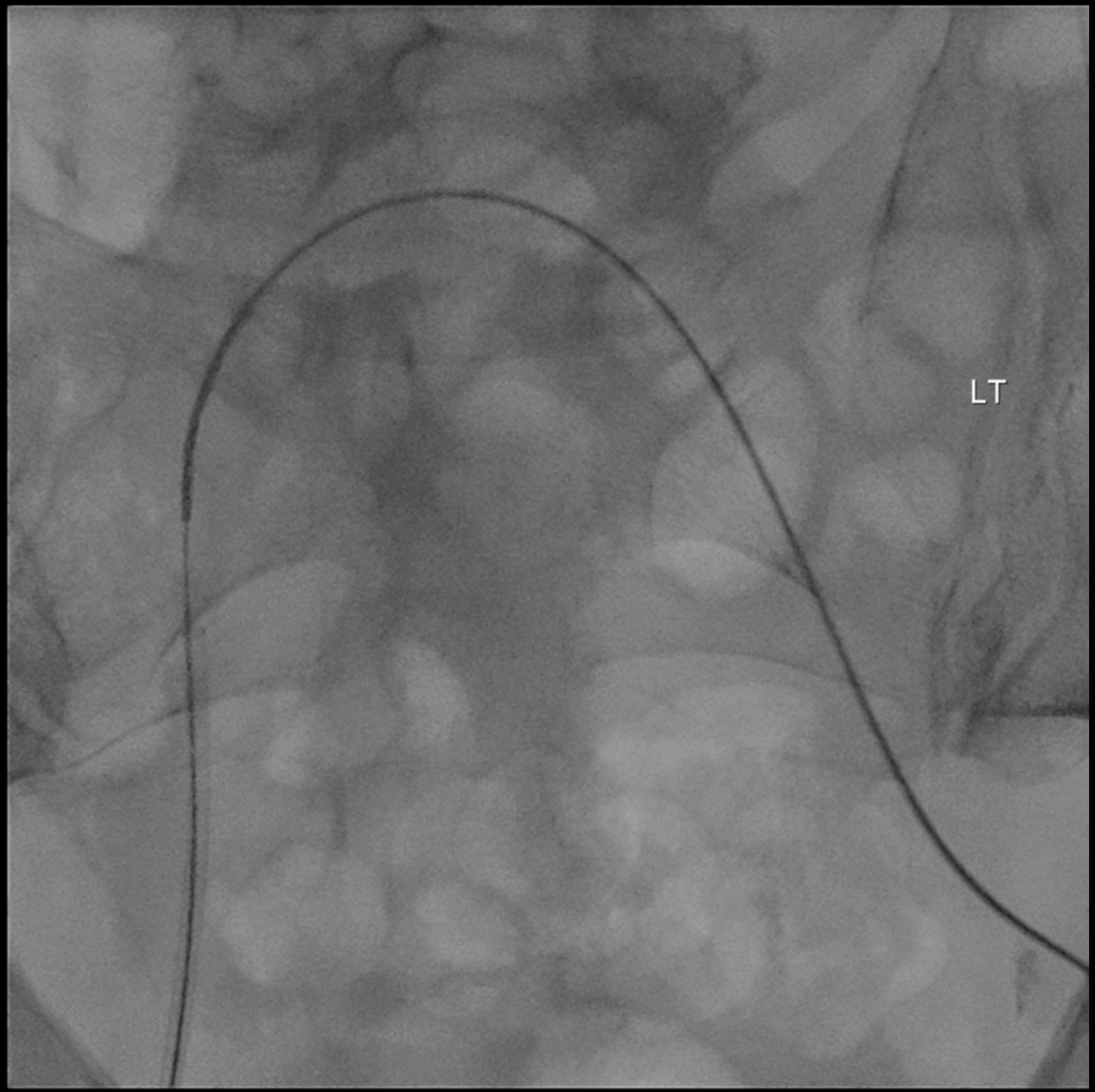


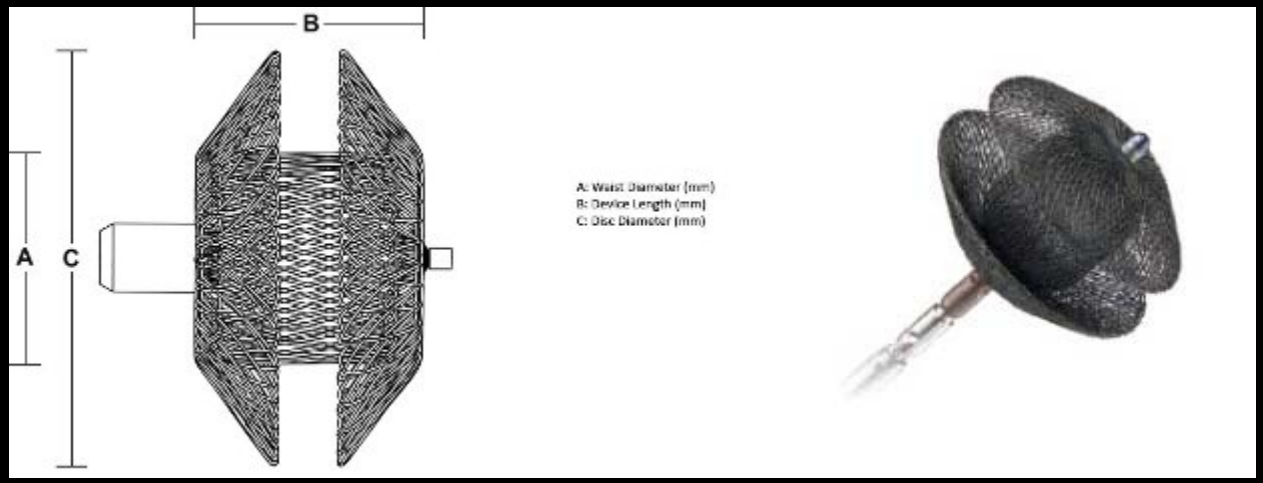
Procedure

- Using the 4 Fr Kumpe catheter and a hydrophilic 0.035 wire, the fistula was crossed from the arterial side
- The wire was advanced in the IVC
- Snared though the 7 Fr venous sheath
- Through-and-through access was obtained from the right CFV to the left CFA

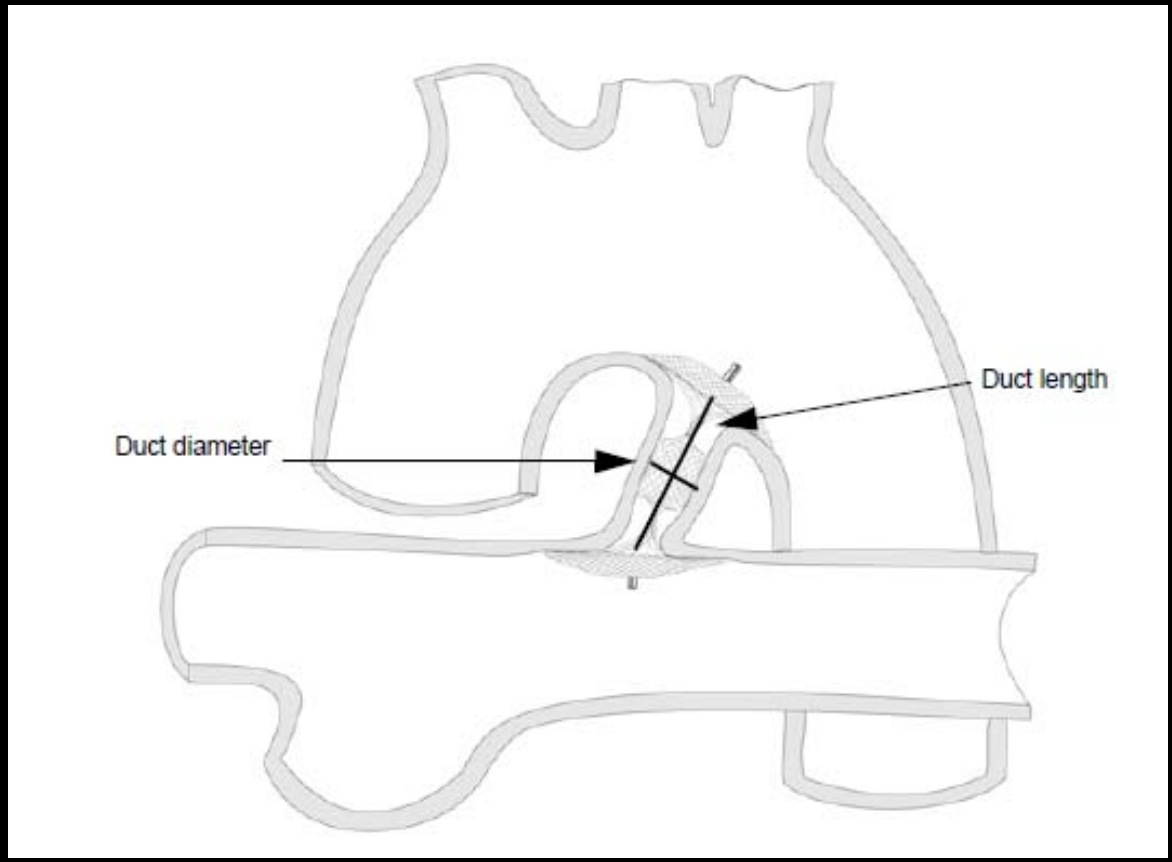

LT

- From the venous side, a 5Fr catheter was advanced across the fistula over the wire
- Deployment of a 3 x 4 mm Amplatzer Duct Occluder II device

A: 3mm
B: 4mm
C: 9mm

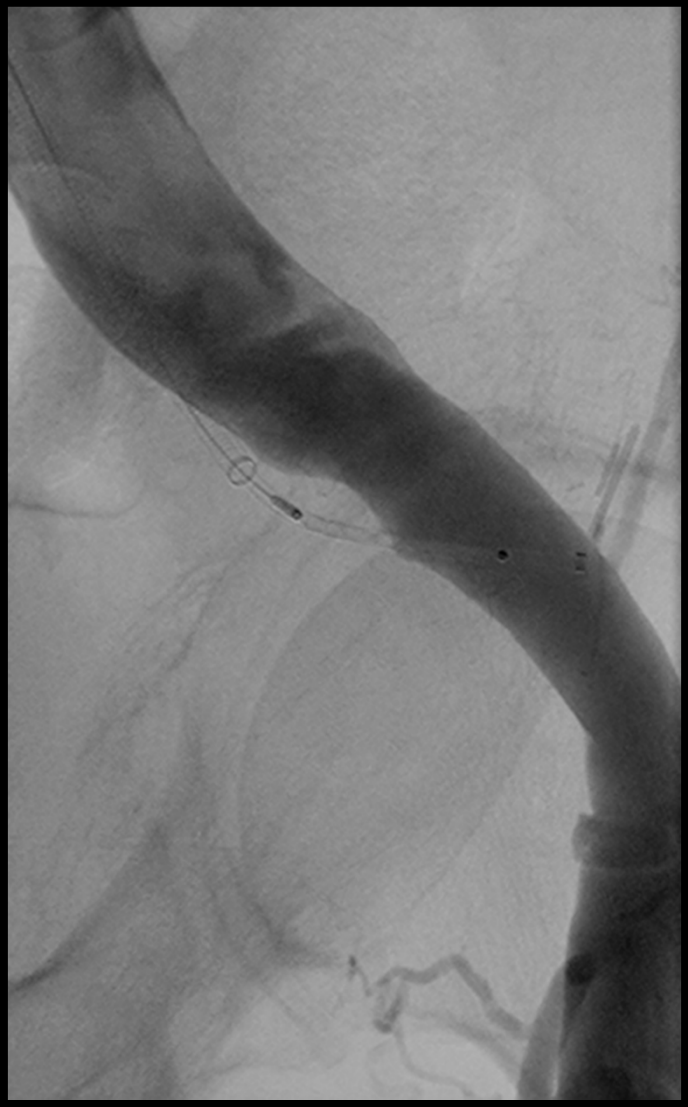


- Duct Occluder (DO) is designed for treatment of patent ductus arteriosus (PDA)

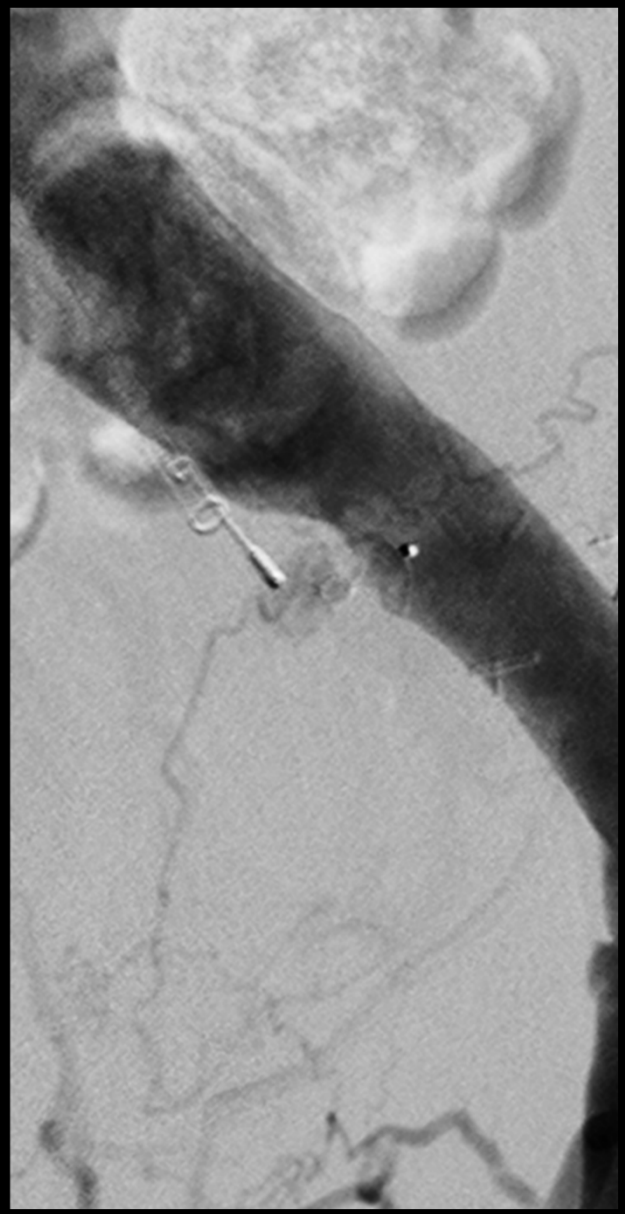


Deployment

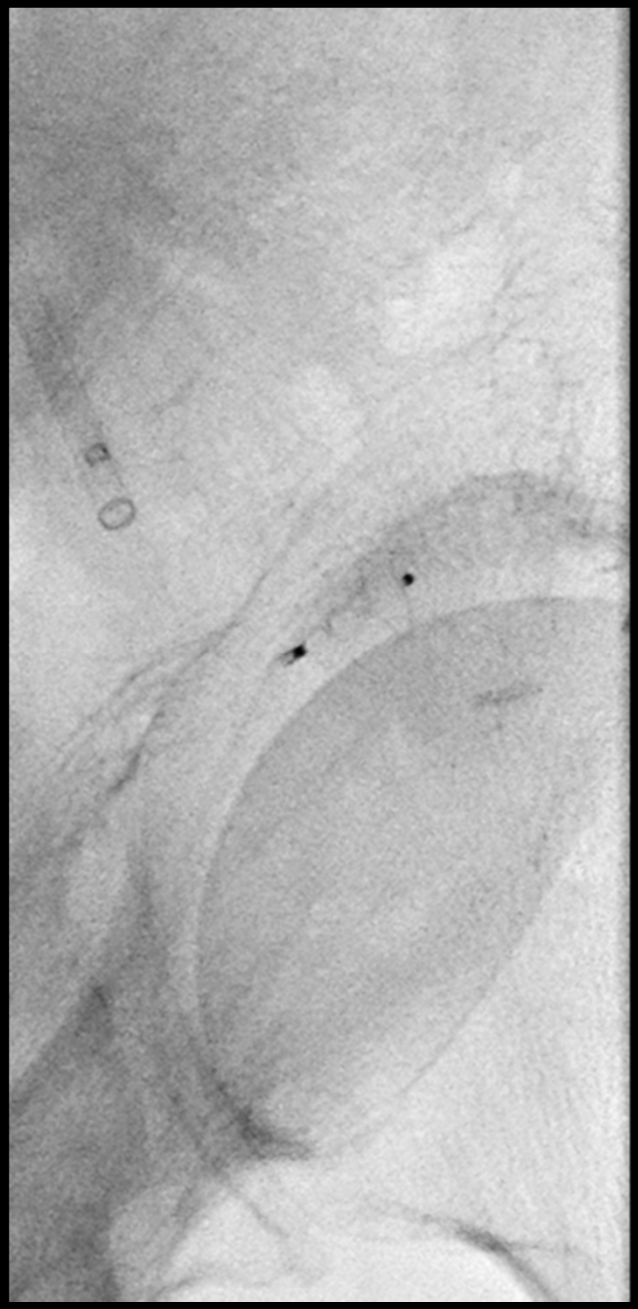
- Distal retention disk was unsheathed
- Device was pulled back until satisfactory disk apposition on the arterial side
- Then the rest of the device was deployed
- Good position confirmed with contrast
- The device was then released

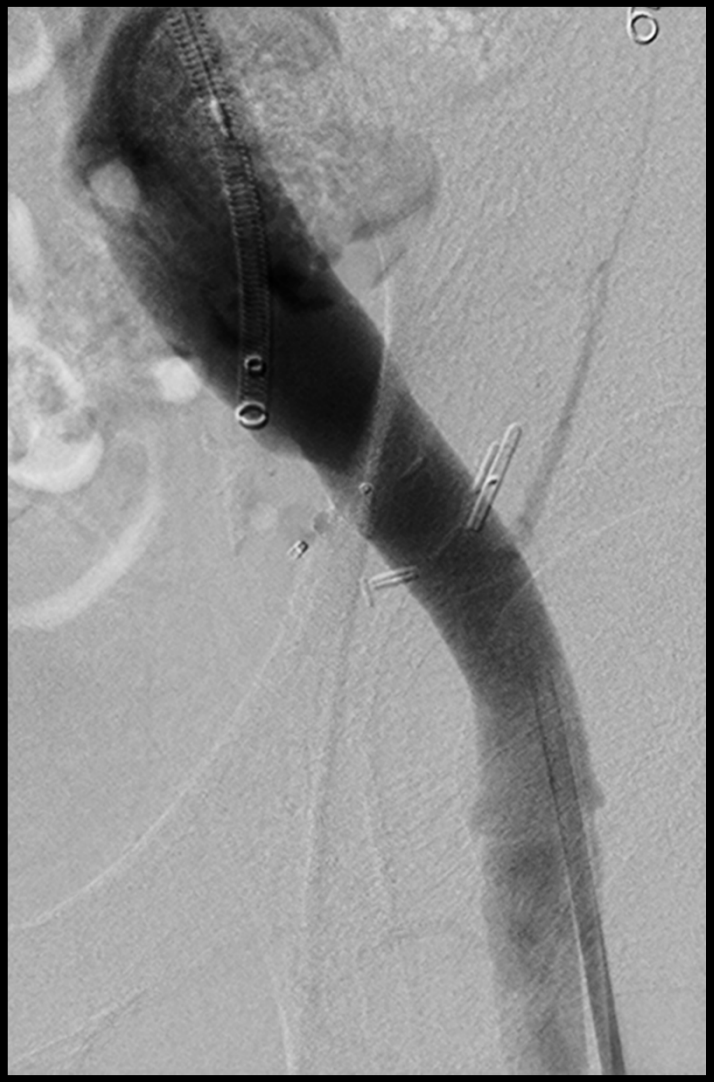


5 Fr catheter across the AVF, with DO device inside



DO plug deployed, still attached





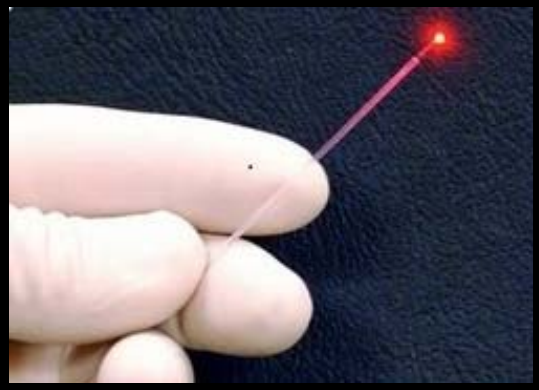
Final run shows good position of the DO plug, widely patent EIA and complete occlusion of the AVF

Follow-up

- Hemostasis obtained by manual compression
- Patient discharged the same day

- 18-month follow-up
  - Patient was asymptomatic
  - Doppler US: trace of flow through the fistula
  - No palpable thrill, no dilated veins

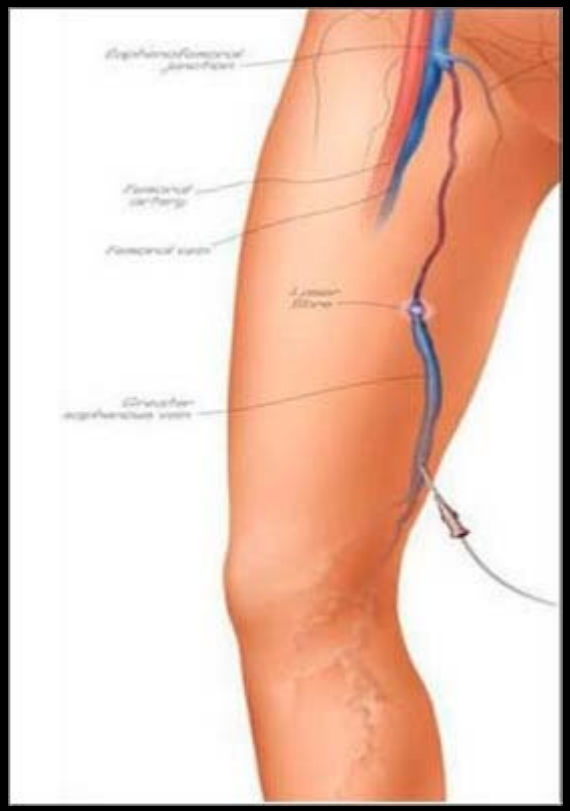
Discussion: EVLT



- **E**ndo**v**enous **L**aser **T**reatment
- Treatment for varicose veins caused by reflux in the saphenous system
- Can be performed in greater or lesser saphenous veins
- AVF following EVLT is a well-described, but rare complication
- 17 cases reported in the literature

Discussion: AVF post-EVLT

- Possible etiologies:
  - Overheating (> 100 J/cm)
  - Insufficient tumescent anesthesia
  - Malposition of the laser tip
    - Proximal to the femoral-saphenous junction



Discussion

- Treatment options for this case:
  - Stent-graft in EIA
    - Was not chosen because of close proximity to the inguinal ligament / CFA
  - US guided compression: lesion was too proximal
  - Duct Occluder plug:
    - Off-label use
    - Low profile of the disk: low risk of repercussion on arterial flow
    - Multiple sizes available, precise deployment
    - Low device migration rate documented

References

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