CAIR Case of the Month

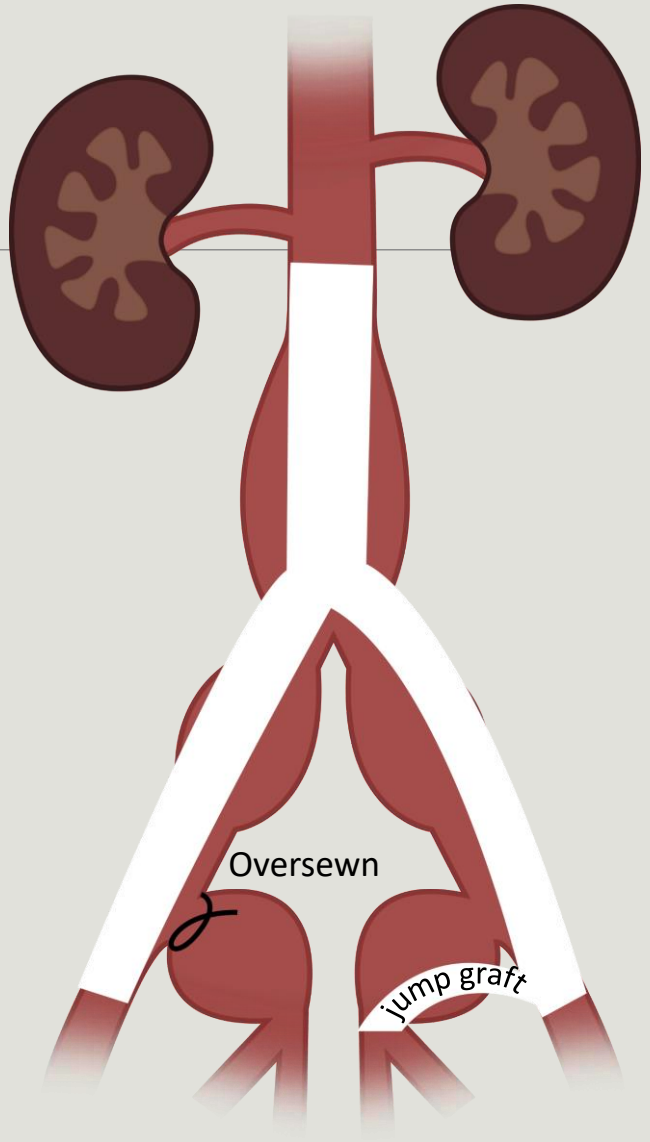
Case Courtesy of Drs. K. Nguyen, E. Roberts, J. Fenton and H. Hennessey
Health Sciences North, Sudbury, ON

Clinical History

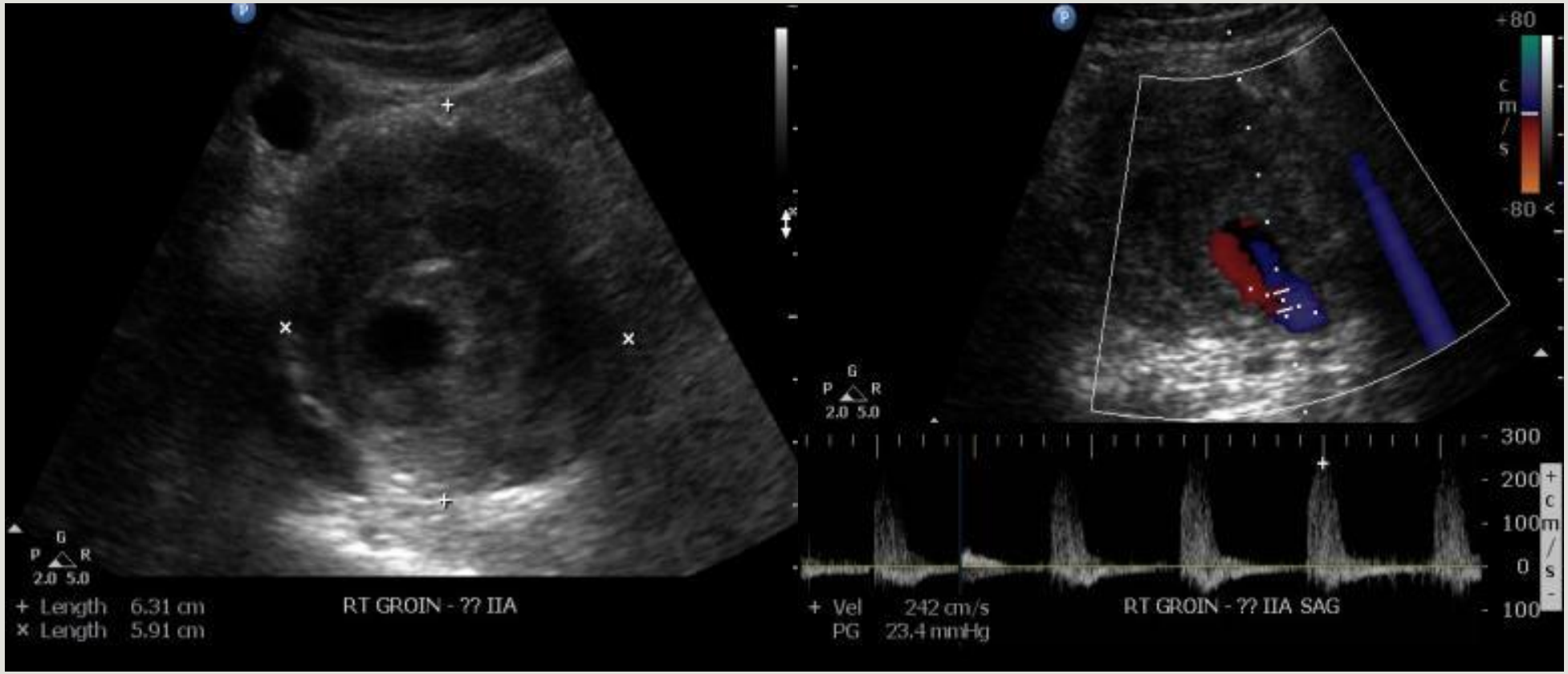
85 year old male

- History of infrarenal AAA and bi-iliac (extending to both IIAs) aneurysms
- Underwent open surgical repair at age 75
  - Aorto-bi-iliac graft
  - Left EIA/IIA aneurysm repaired by EIA end-to-end anastomosis with aorto-bi-illiac graft and a jump graft from left limb of aorto-bi-iliac graft to the left IIA
  - Right EIA/IIA aneurysm repaired by EIA end-to-end anastomosis with aorto-bi-illiac graft and oversewn origin of right IIA

Presenting with expanding right IIA aneurysm



U/S June 2018


+ Length 6.31 cm
× Length 5.91 cm
RT GROIN - ?? IIA
+ Vel 242 cm/s
PG 23.4 mmHg
RT GROIN - ?? IIA SAG
+80
-80
300
200
100
0
-100
cm/s

CT Angiography

Is this an endoleak?

- The term endoleak is traditionally used in the context of persistent perfusion within the aneurysm sac following ***endovascular*** aneurysm repair (EVAR)
- This patient, however had an ***open*** repair with persistent “back-bleeding”, which is exceedingly rare but has been documented to occur
- For the purposes of this presentation, this phenomenon will be referred to as ***endoleak*** given the similar mechanism

Intervention #1

- Given patient's age and aneurysm location, surgery was not option (as per vascular surgery team)
  - In event of aneurysm rupture, comfort care only
- Case discussed and reviewed w/ IR colleagues
  - Proposition #1: direct ***CT-guided puncture*** of aneurysm sac followed by embolization in the Angio Suite

CT-guided puncture

Angiogram under fluoroscopy

Attempted embolization using

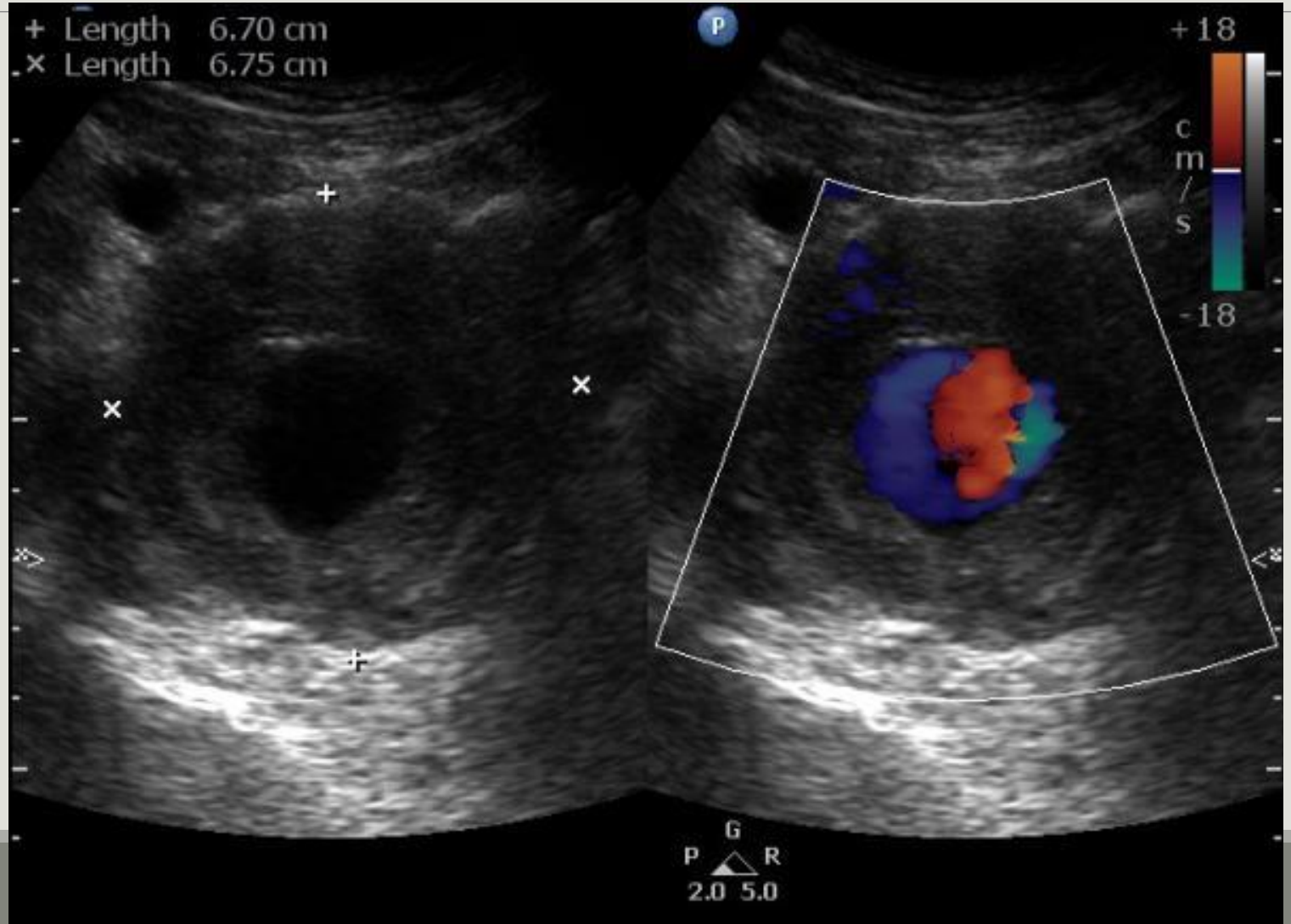
- IDC/Nester coils
- Histoacryl/Lipiodol
- Gelfoam

6 months post coiling and embolization…

FOLLOW-UP CT ANGIOGRAM

6 month f/u CT

6 mo f/u US

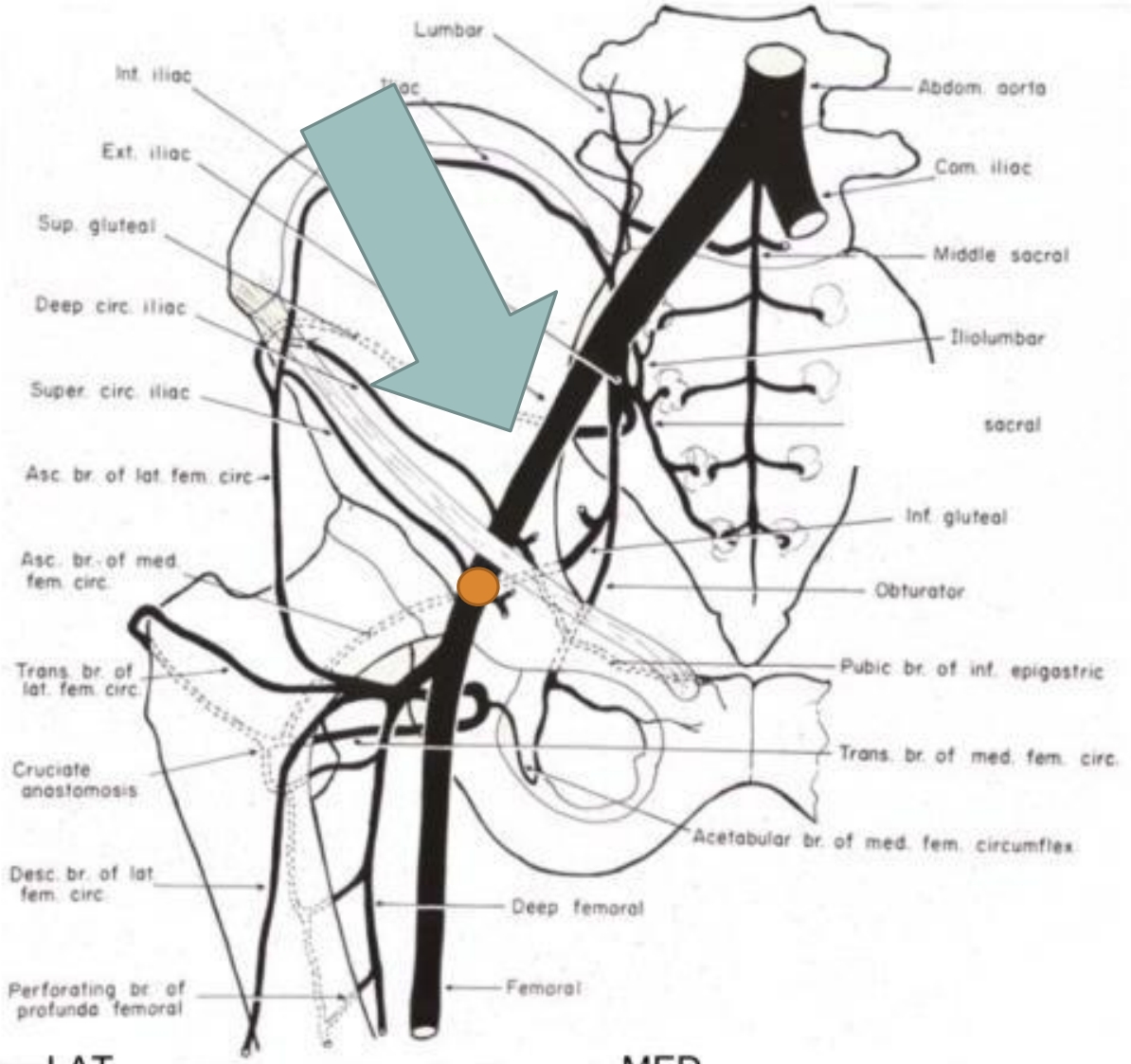


Intervention #2

- Second IR consultation
  - Proposition #2: After review of CTA, could attempt to cannulate the ***inferior gluteal artery*** via the cruciate anastomosis from the 1st perforating branch of profunda using microcatheters

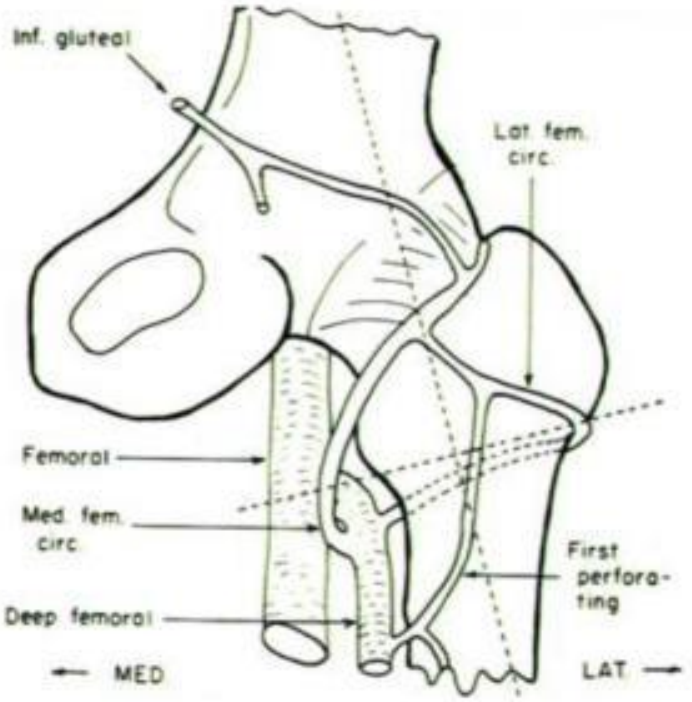
The Anastomosis around the Hip

(Anterior view)

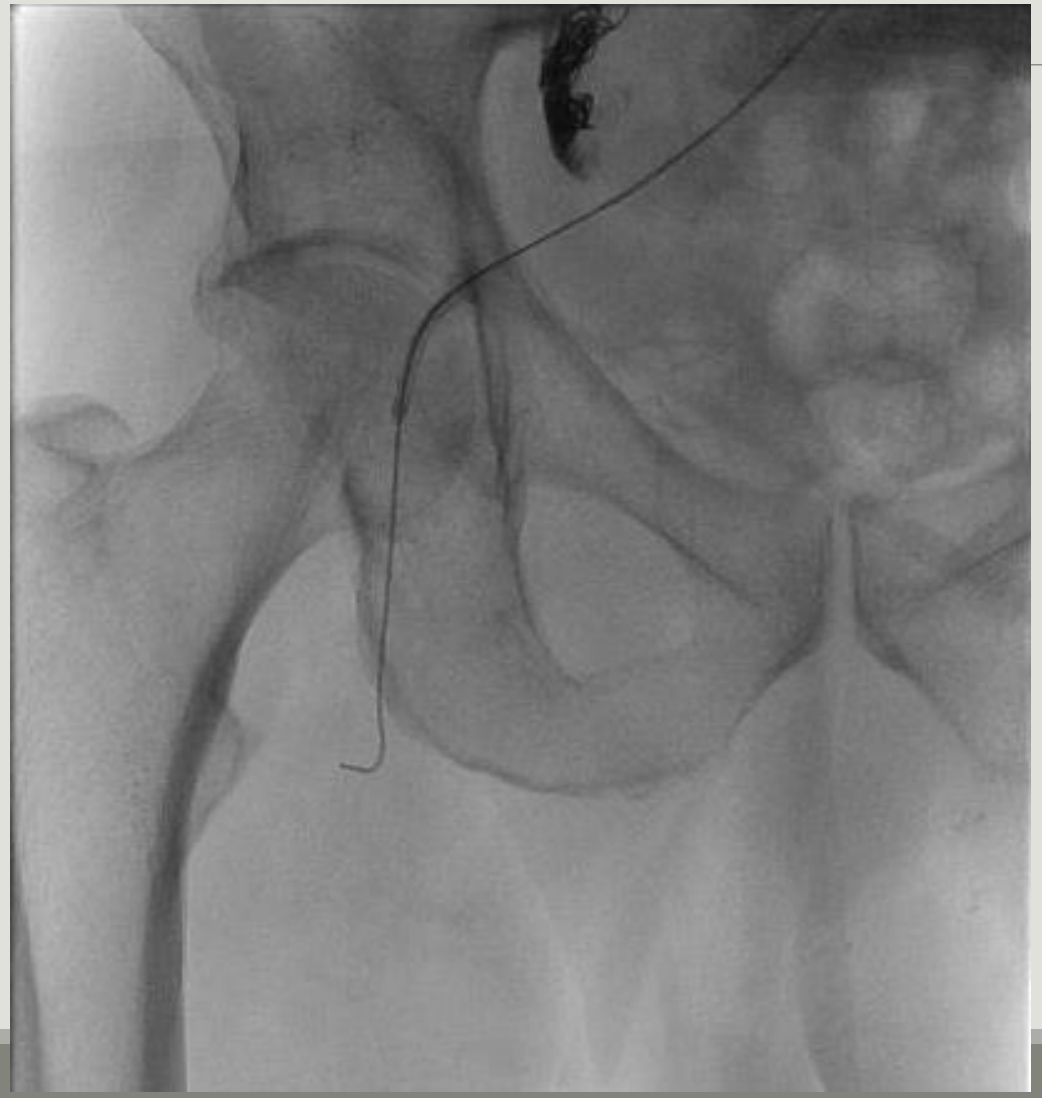


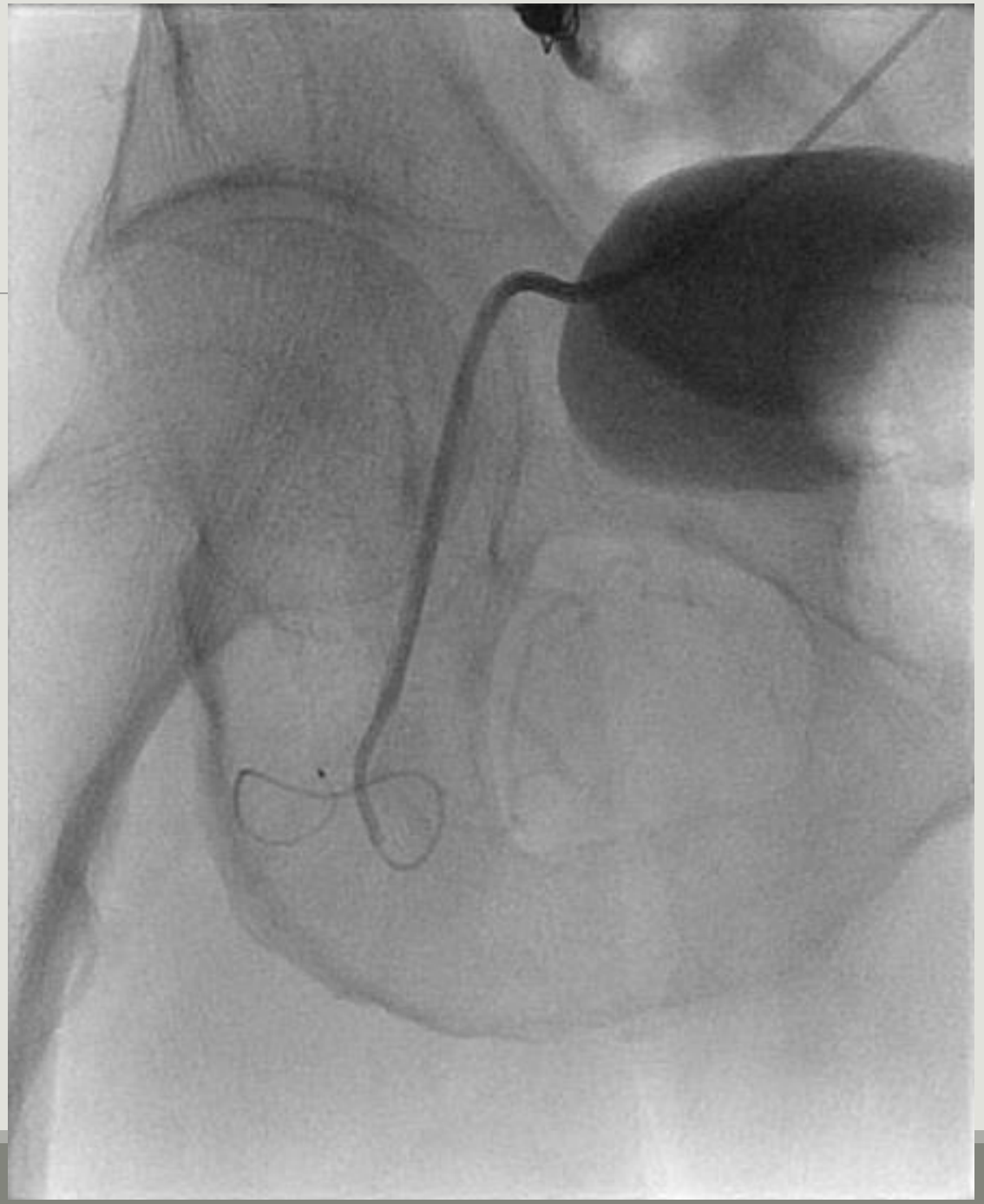
Cruciate Anastomosis

(Posterior view)



Guidewire + microcatheter insertion





Despite best efforts, could not cannulate further distally

No embolization performed…

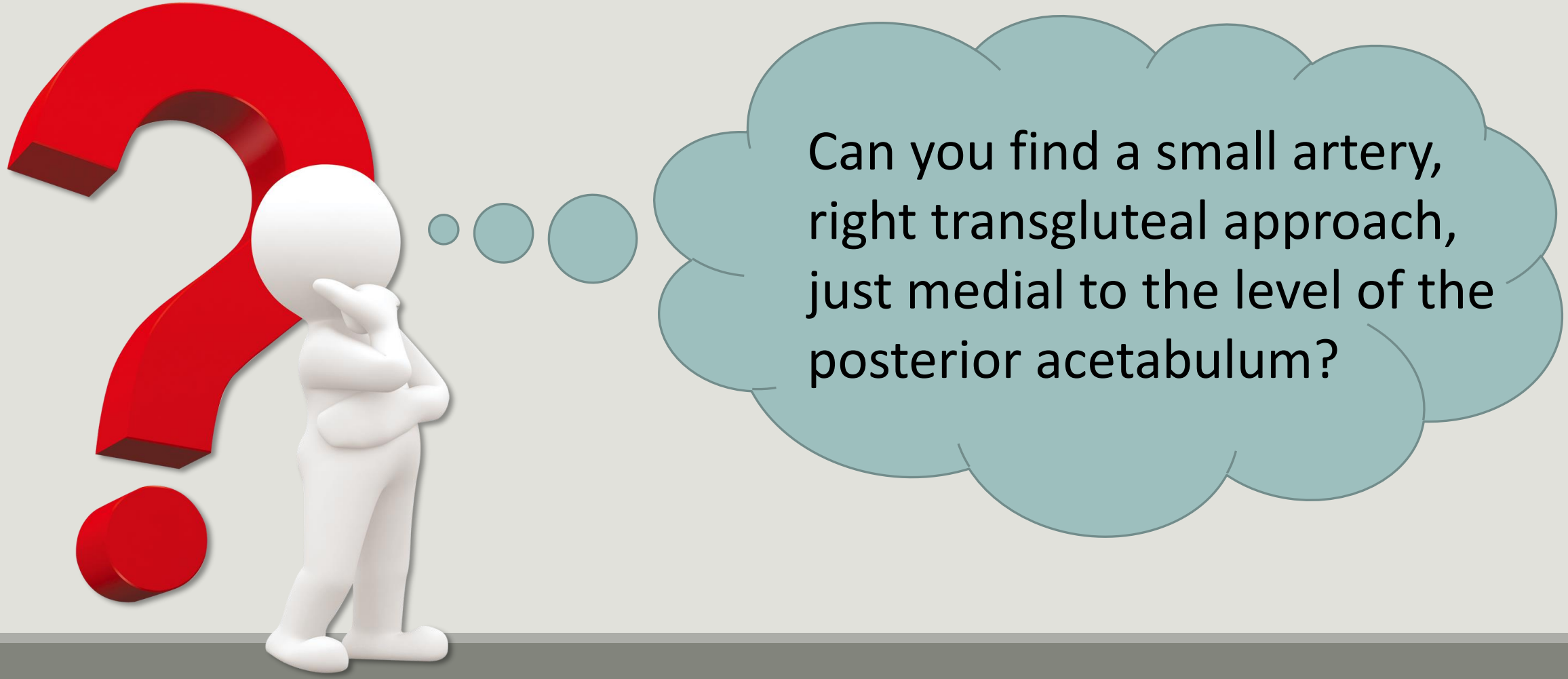
A thought between cases, 1 hour post procedure…

How else can we reach the right inferior gluteal artery?

Let’s go back…

Next

Approached an US tech




Vasc Arterial
L12-5
7Hz
2D
62%
Dyn R 56
P Low
Gen
CF
49%
3750Hz
WF 168Hz
5.0MHz
TIS0.1 MI 0.8
M2 M3
+28.9
-28.9
cm/s
X1
RT ART POSTERIOR
6.0cm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-28.9
cm/s
X1
RT ART POSTERIOR
6.0cm

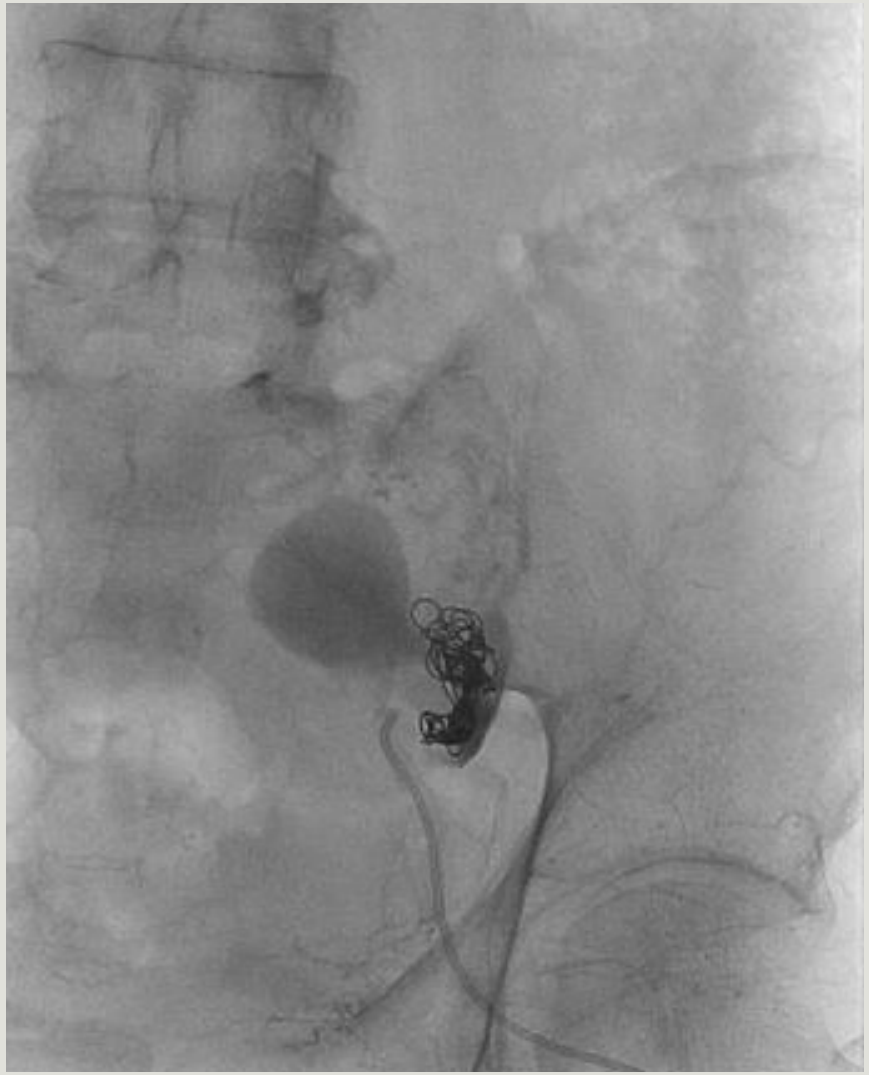
The patient was brought back

Intervention #3

The ***inferior gluteal artery*** was located under ultrasound with the patient prone and was cannulated using a micropuncture set

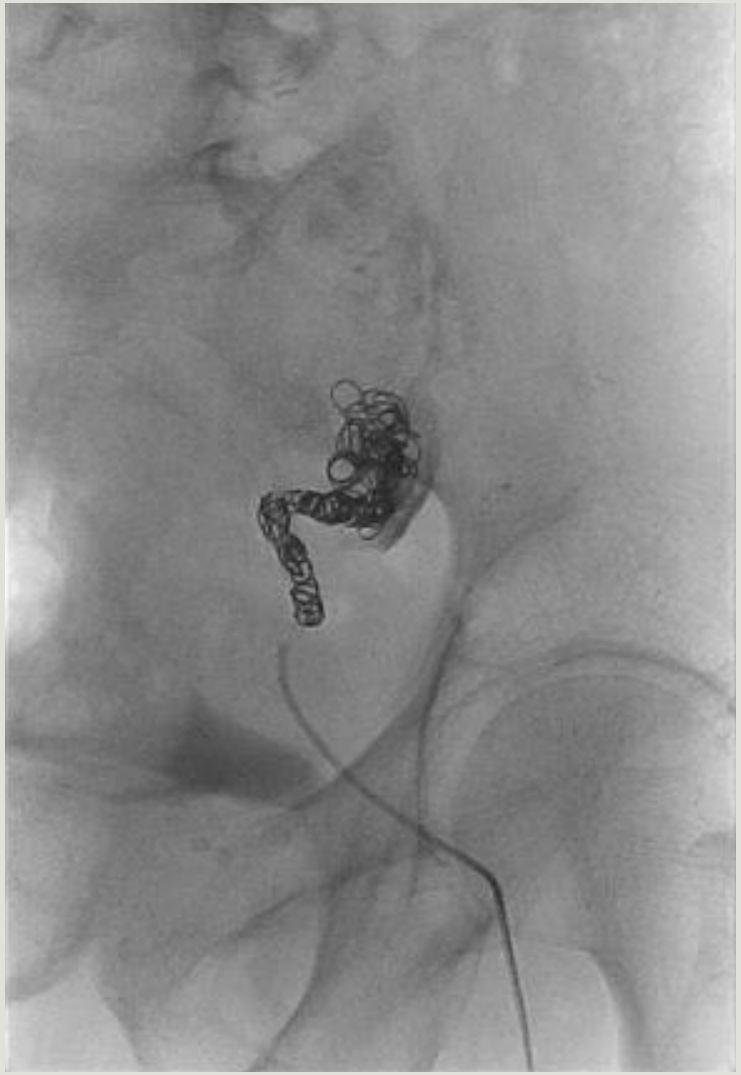
0.018 wire

Angiogram



Deployment!

Embolization using nest of coils (IDC) from sac back down the IIA anterior branch (“inferior gluteal”) & gelfoam slurry



Post-embolization angiogram

We did it!!!

- We got in, now how to get out?
- How do we obtain hemostasis?

1. Identify puncture site under fluoroscopy with hemostat

2. Embolize the remainder of the vessel back to the puncture site using thick *gelfoam slurry*

3. Manual compression against posterior acetabulum x 10 minutes

Followed by having patient sitting upright on a chair with rolled towel over right buttock for 4 hours

1.5 month post procedure patient clinically doing well per vascular surgery team
F/U US and CTA arranged

Open surgical repair vs EVAR (elective)

	Open Repair	EVAR
Mortality 0-6 mo	7%	4%
Mortality >8 years	46%	53%
Peri-operative complications	31.0%	16.2%
Length of stay	12.6 days	5.6 days
Reintervention rate	12%	26%

Source: EVAR I trial by PATEL, R et al.
A comparative review of open and endovascular abdominal aortic aneurysm repairs in the national operative quality improvement database by KALRA, K. et al.

EVAR complications

- Aneurysm-related deaths in the EVAR category are mainly due to secondary sac rupture, usually due to ***uncorrected endoleak***
- This is why close imaging follow-up is required after EVAR
- Currently, imaging follow-up post open surgical repair is NOT routine

Open Surgical Repair Complications

- Open surgical repair of AAA has been performed for over *40 years*
- "Endoleak" post conventional open repair was only first described in ***2000*** by Chan et al. and remains a rare complication
  - Most case reports describe a type I endoleak picture, related to anastomotic disruption
  - They present fairly early (between 6 weeks and 18 months post surgery)
  - Type II endoleaks present later, hypothesized to be due to recanalization of vessels previously occluded during surgery
  - No long follow-up term studies have been developed to look at endoleaks as a complication
  - Evidence currently not strong enough to advocate for routine imaging F/U