CIRA Case of the Week November 2015

Case Courtesy of Drs. Basim Felemban and Christopher Lightfoot

Dalhousie University

CASE HISTORY

- 66 year-old female was transferred from a regional hospital, - 3 week history of diarrhea and progressive abdominal pain
- Previous medical history: HTN, anxiety, past smoking history
- Referral CT reported as moderate atherosclerotic disease of the abdominal aorta with calcified celiac and SMA origins. No bowel findings were noted.
- Upon admission:
- Labwork:
- CBC: WBC elevated (14.02), Hgb low (80)
- Electrolytes: normal
- Coagulation Profile: normal
- A CTA was requested by the on-call vascular surgeon to assess for bowel ischemia

CTA


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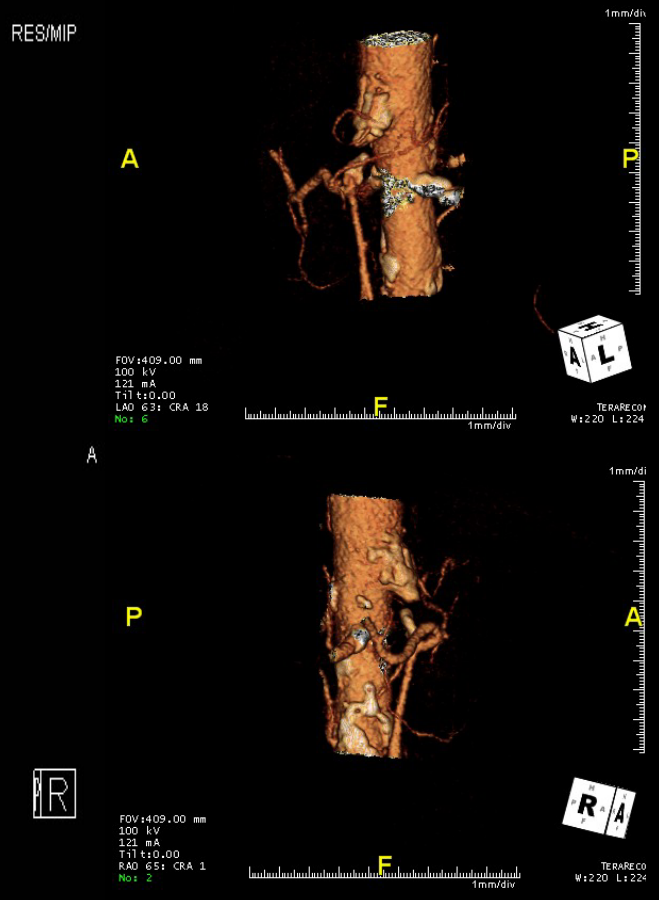
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TERARECON
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CTA RESULTS

- Common origin of both the celiac trunk and the SMA (celiac-mesenteric trunk)
- Heavily calcified occlusion at the origin
- Conventional hepatic arterial anatomy, small caliber splenic artery, small caliber SMA
- Bowel perforation
- Focal regions of hepatic infarction

CASE HISTORY

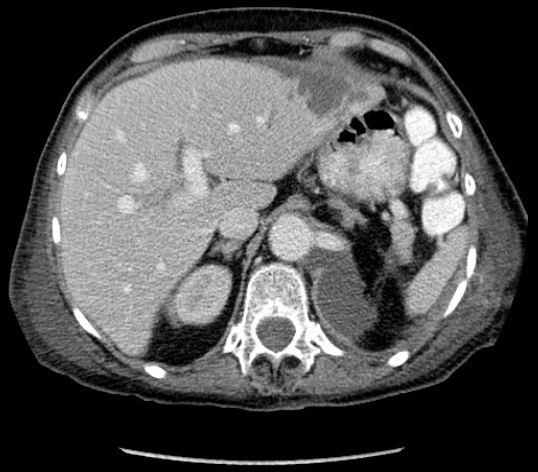
- General surgery – SB resection x 2.
- Vascular surgery – Aorto-SMA bypass graft
- Returned to OR POD #2 for repair of enterotomies and anastomotic leak. Necrotic GB was removed.
- Transfer to home hospital.

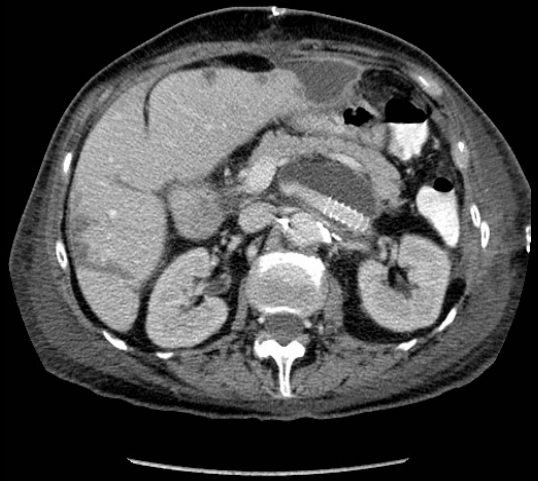
- Slow to recover. Wound infection.
- Repeat CT performed
  - Multiple abscesses
  - Simple fluid collection around graft

CASE HISTORY

- The patient was transferred back to our center. She was treated conservatively by IV antibiotics
- An Indium WBC scan was performed to exclude an infected collection around the bypass graft - the result was negative
- The patient clinically started to become better and was transferred back to the regional hospital

CT

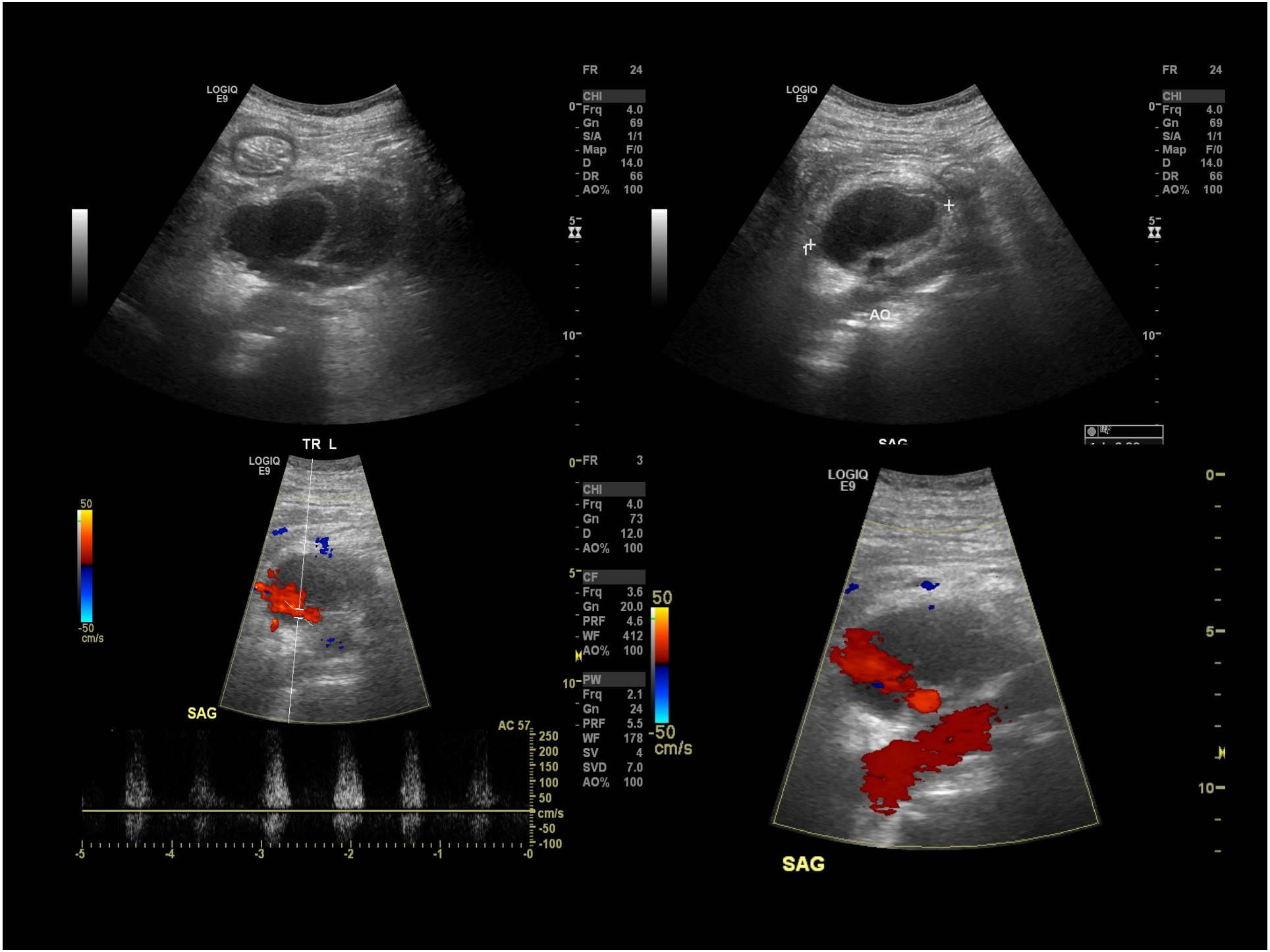




Indium-WBC scan

CASE HISTORY

- Slow to recover
- US was performed to look for further abscess formation
- This revealed a pseudoaneurysm near the prior fluid collection
- Findings confirmed on CTA
- The site of the leak arose from the proximal native SMA, just above the distal graft anastomosis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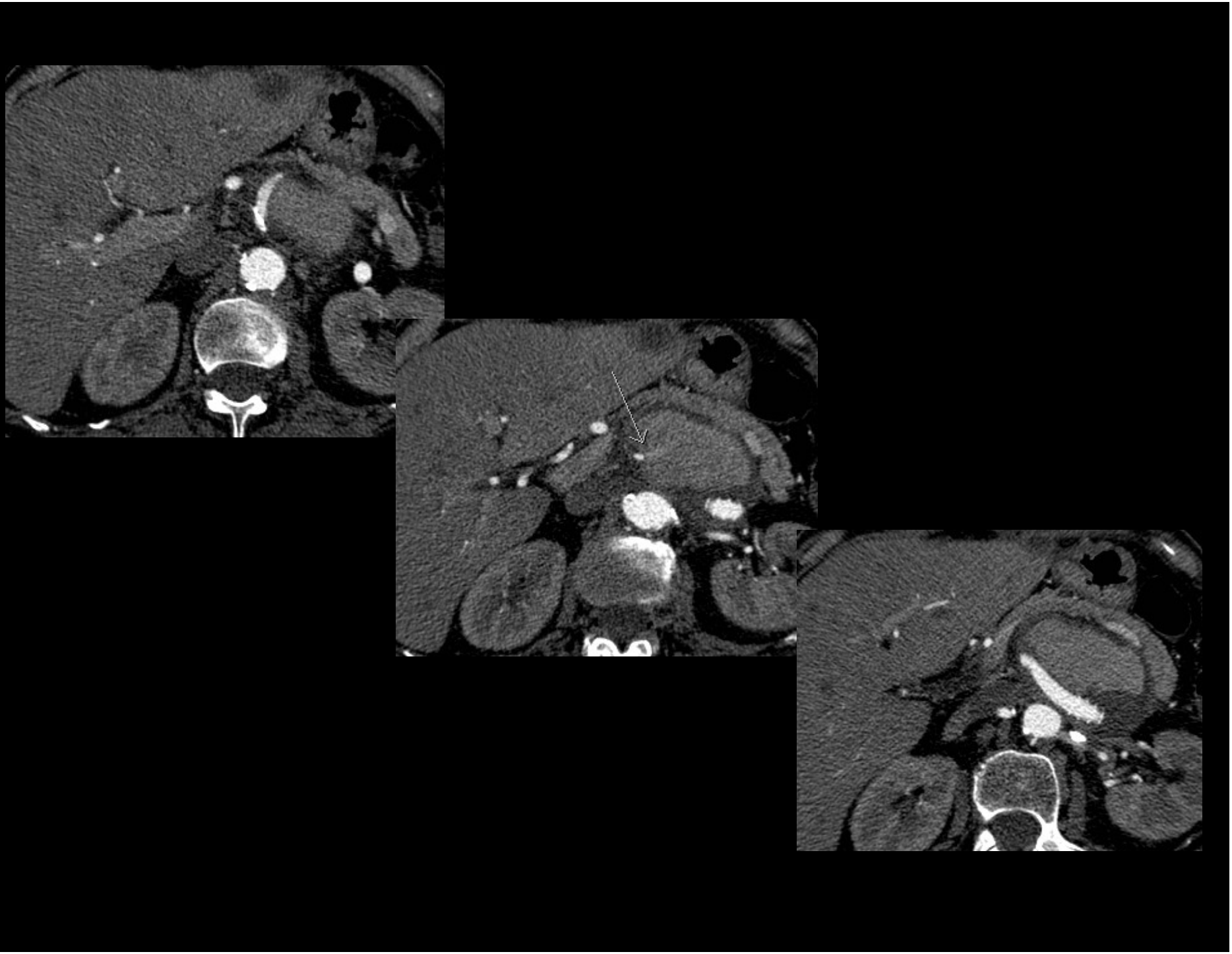
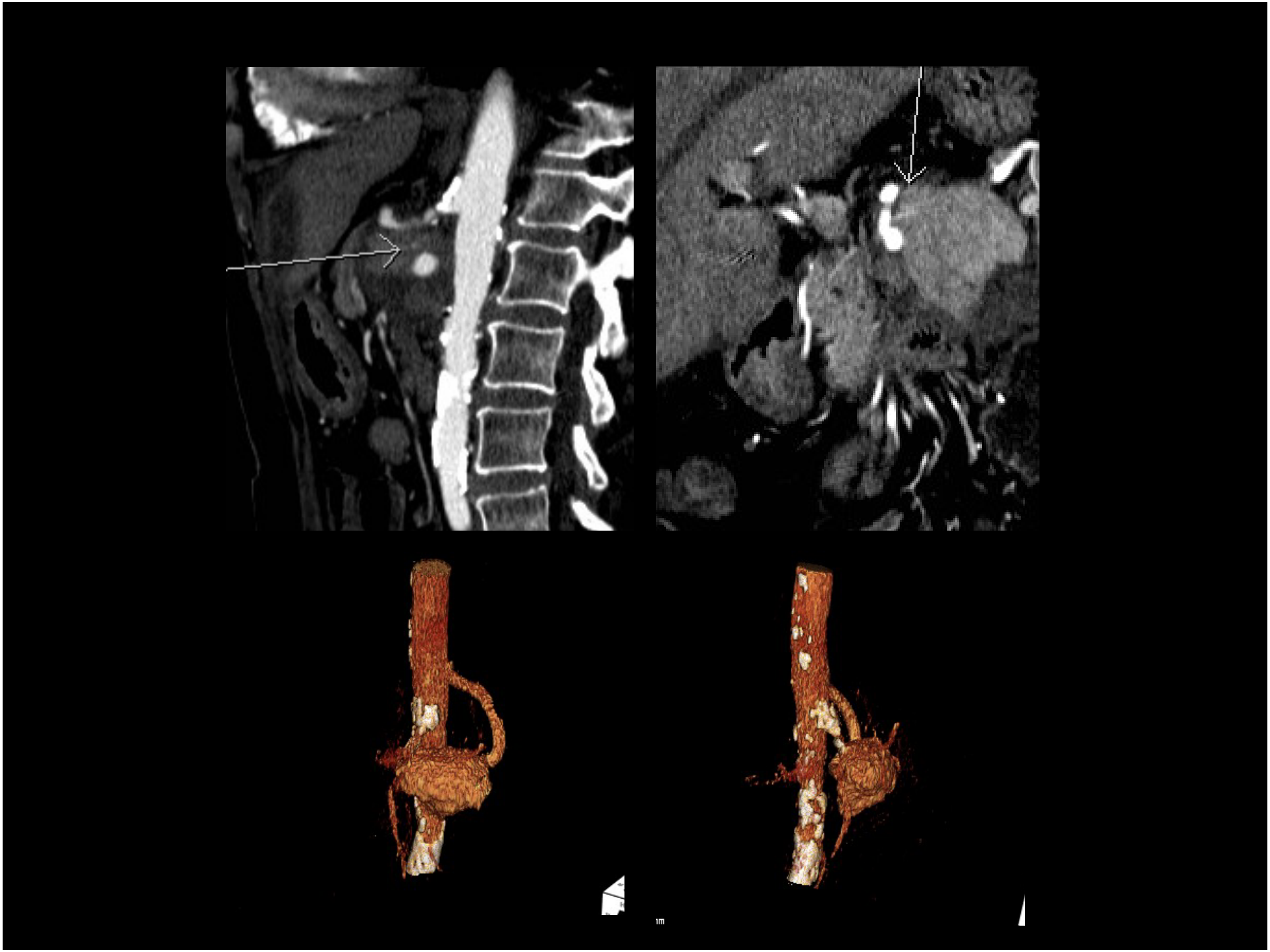




CASE HISTORY

- The patient was deemed very high risk for repeat surgery given that she was several weeks post-operative from the initial procedure and her overall status
- Consideration given to:
  - Embolization
  - Covered stent
  - Percutaneous thrombin injection
  - Surgery

ENDOVASCULAR PLAN

- Plan A = use a micro-occlusion balloon to try to occlude the pseudoaneurysm origin – similar to the external pressure applied on the groin to occlude a groin pseudoaneurysm neck

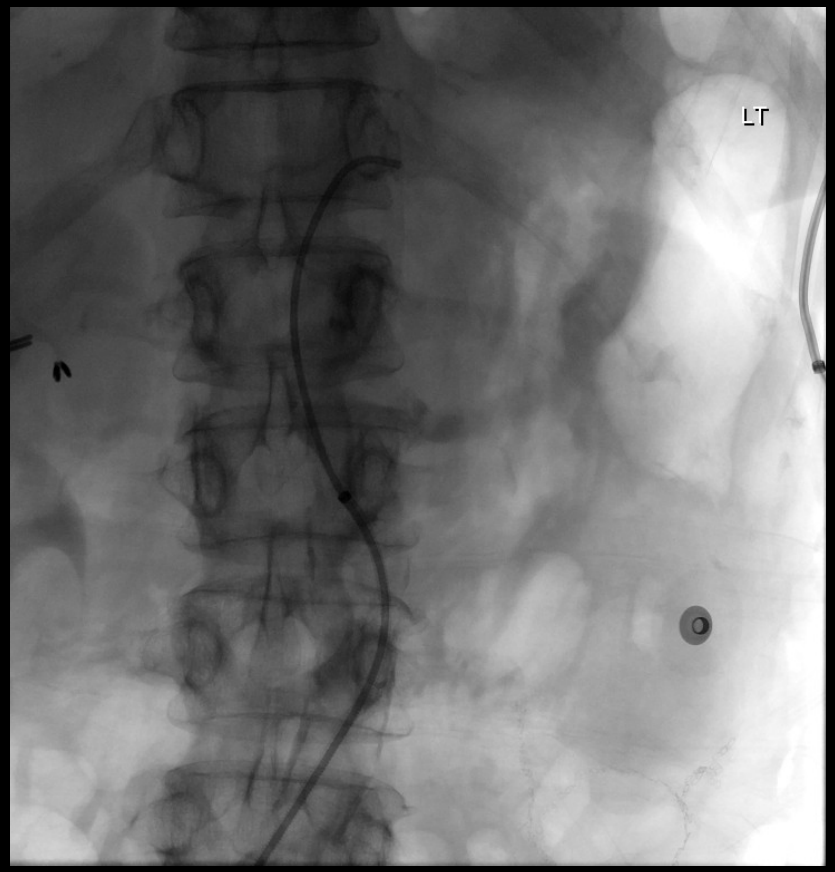
- Plan B = covered stent

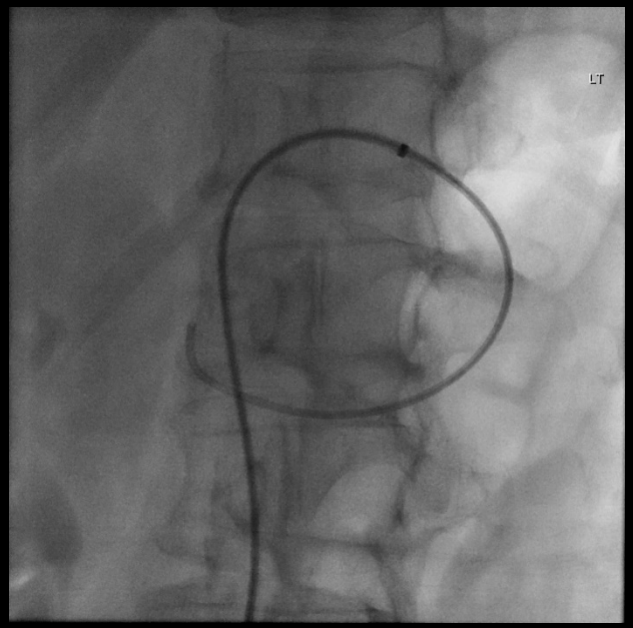
PROCEDURAL DETAILS

- From a right femoral puncture, a 6 Fr curved braided sheath and a 5 Fr C2 catheter were advanced to the upper abdominal aorta and the origin of the aorto-SMA bypass graft was selected.

- An arteriogram was performed to outline the graft anatomy

ANGIOGRAPHY

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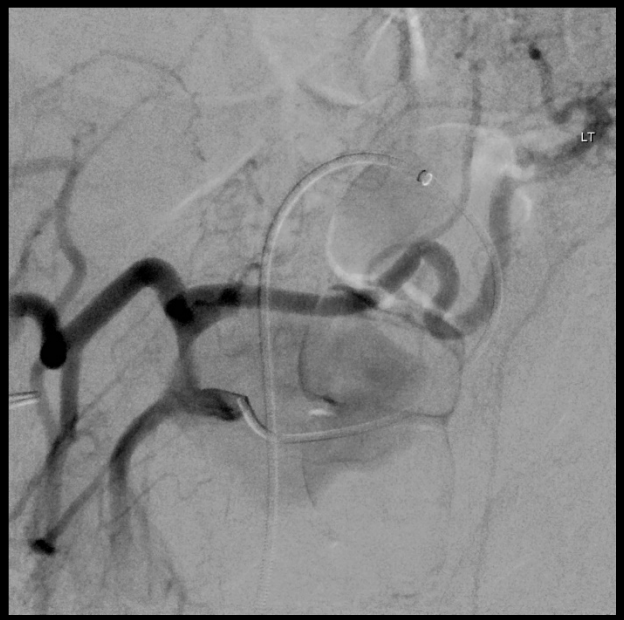
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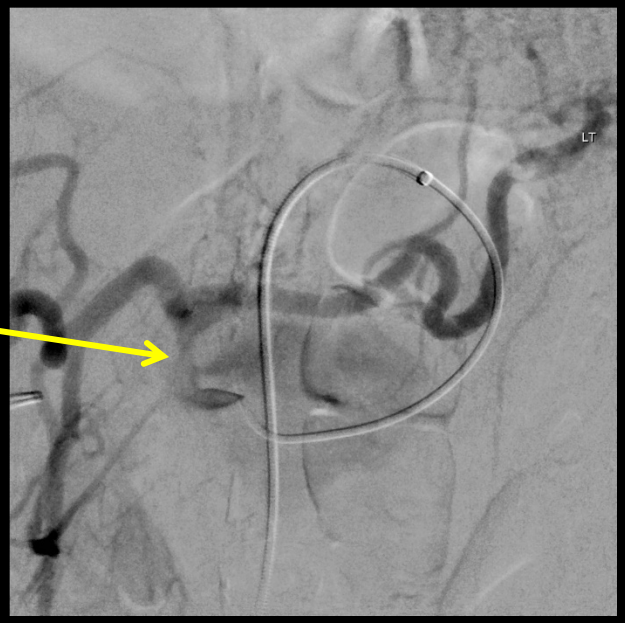
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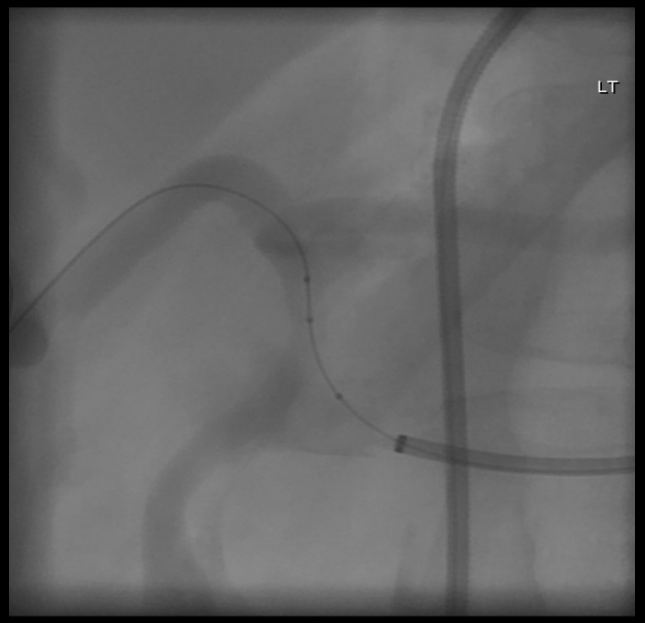
PROCEDURAL DETAILS

- The 5 Fr selective catheter was exchanged for a 6 Fr guiding catheter followed by an arteriogram.
- A micro-occlusion balloon was advanced over a microwire.
- The occlusion balloon was advanced to the proximal SMA, covering the pseudoaneurysm origin and left inflated for 20 minutes.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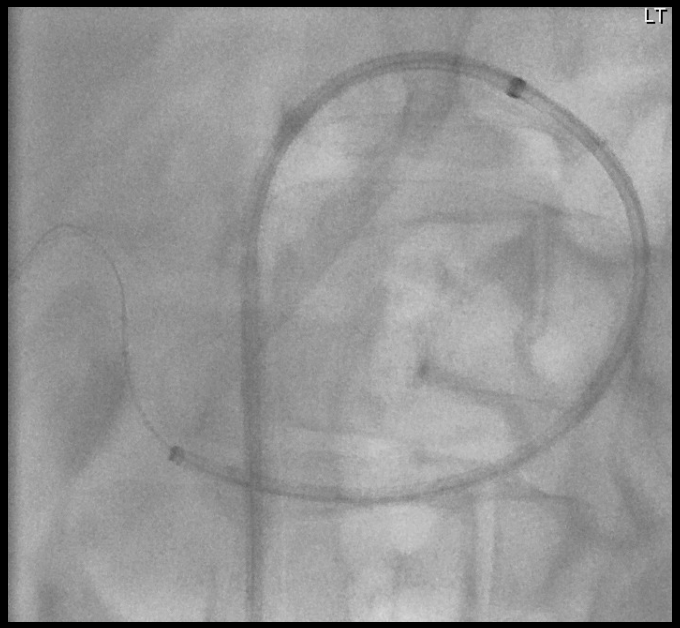
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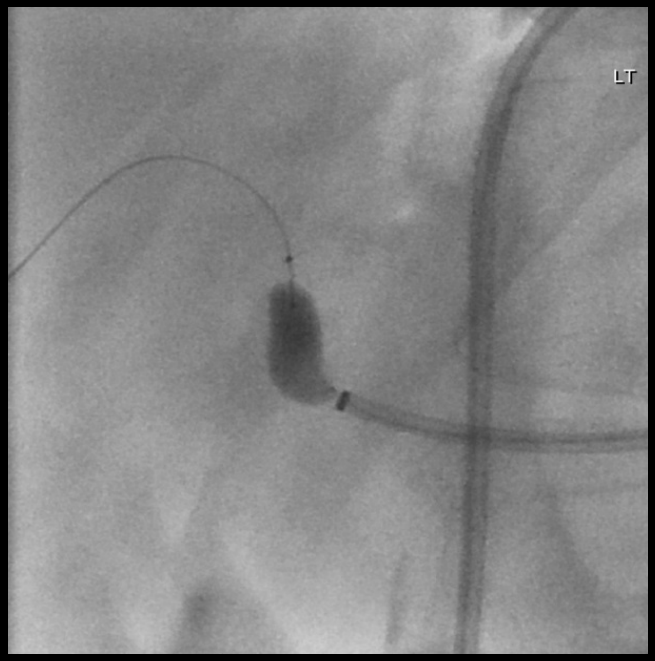
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- It didn’t work!!!

PROCEDURAL DETAILS

- A decision was made to deploy a covered stent
- The common hepatic artery (CHA) was selected. It was challenging to advance due to angulation in the bypass and groin approach – poor pushability.
- Hence, a stiff wire was positioned at the origin of the CHA and a 6 mm x 16 mm covered stent was inserted
- An arteriogram was performed


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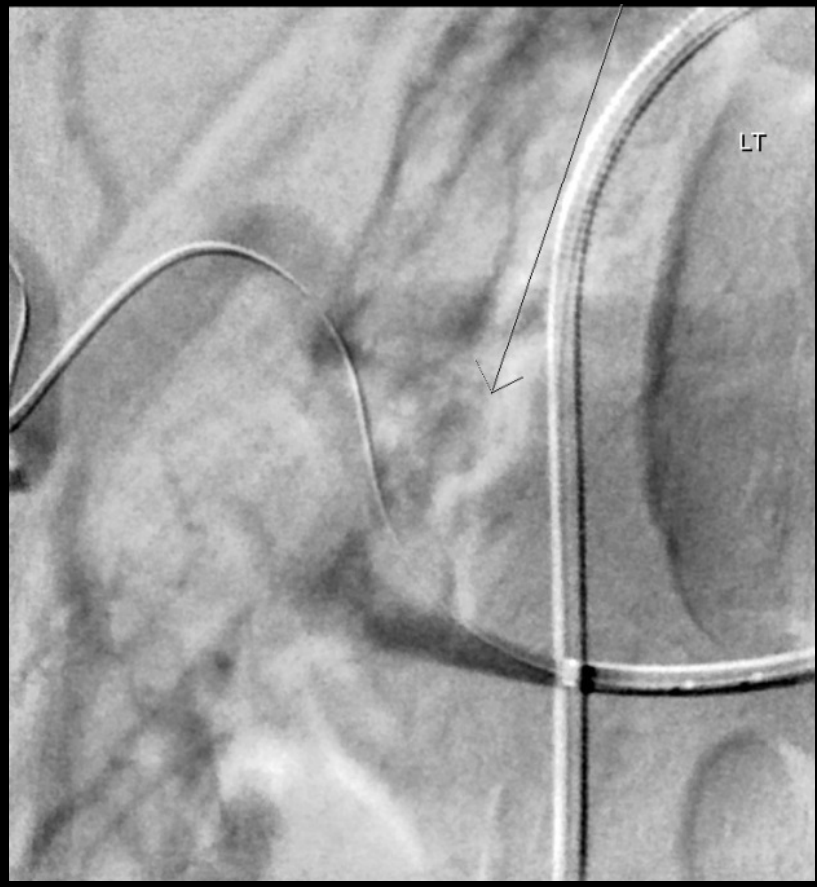
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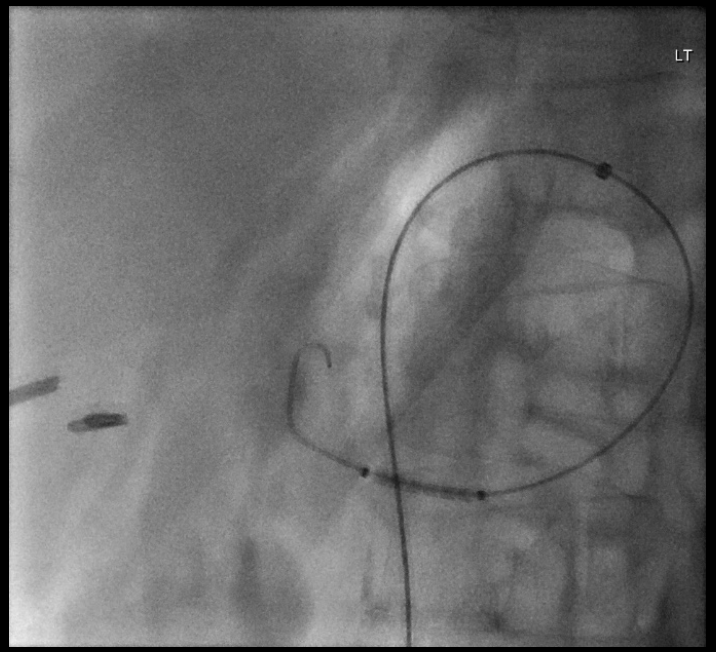
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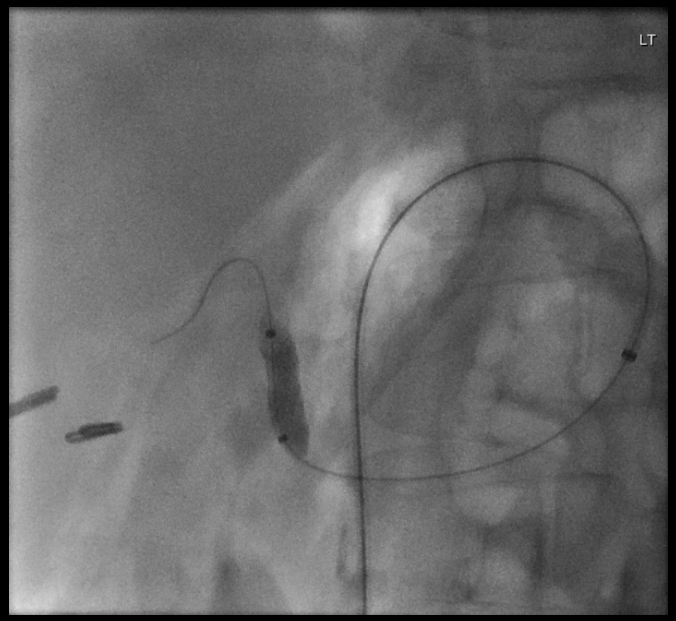
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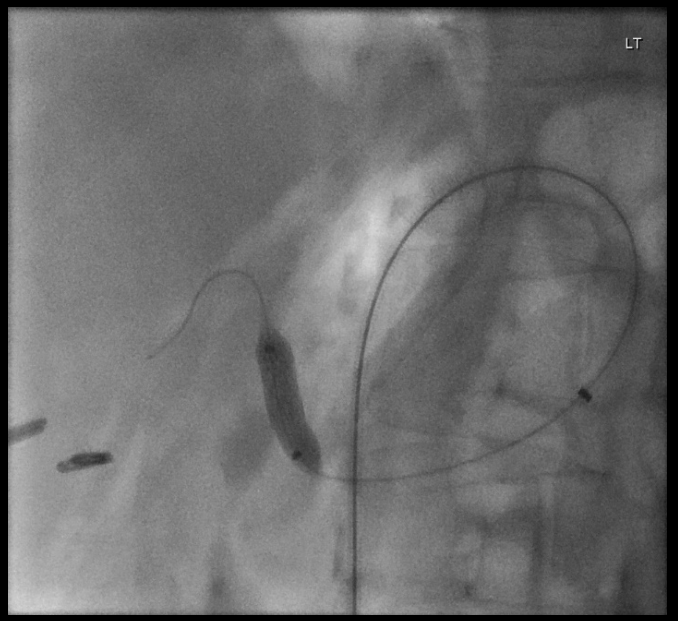
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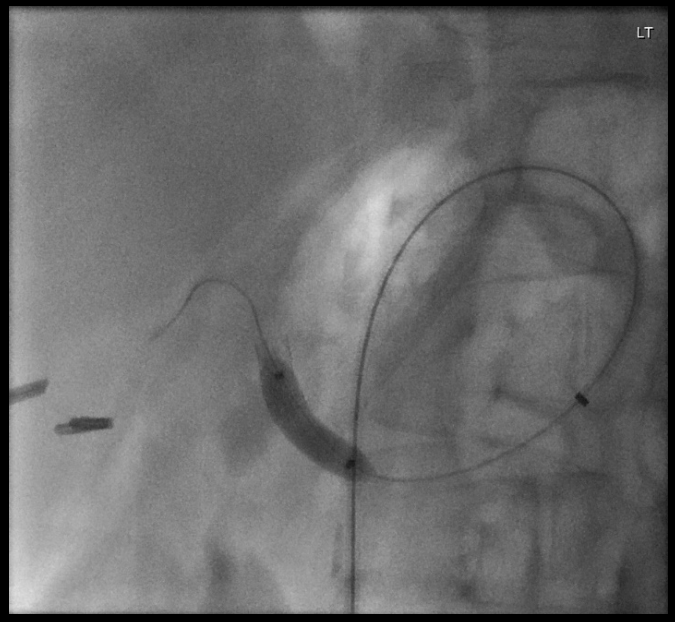
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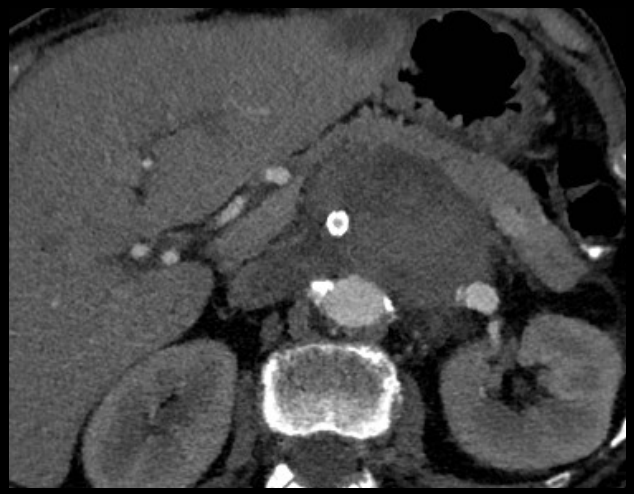
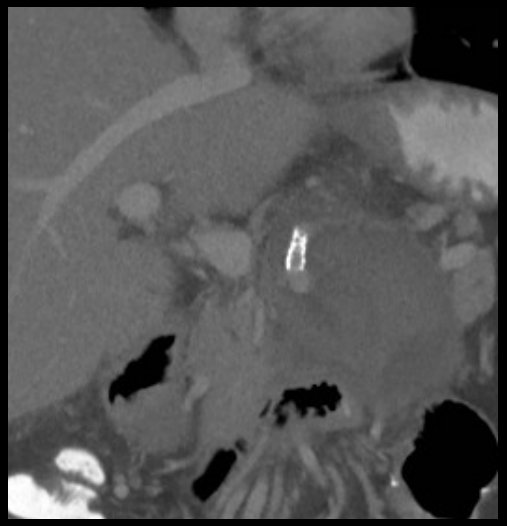
PROCEDURAL DETAILS

- The stent was inflated in the proximal aspect of the SMA between the celiac trunk and the distal graft anastomosis
- It was then dilated and slightly molded at its inferior aspect by the deployment balloon
- Follow-up arteriogram showed excellent immediate angiographic result with complete exclusion of the false aneurysm (no leak around the covered stent), patency of the bypass graft, SMA, hepatic and splenic arteries

- A follow up CTA two days later confirmed the good results with no pseudoaneurysm filling.

CT





SMA ANEURYSM/PSEUDOANEURYSM

- Visceral aneurysms/pseudoaneurysms are rare entities – 0.1 – 2 % of general population [1]
- SMA aneurysm – rarely described in the literature[1]
- SMA pseudoaneurysms - the 4th most common visceral aneurysm – 4% prevalence[1]
- High rupture rate (20 -30 %), high mortalitiy rate (30–50 %) [1]
- Age group affected – 45 – 55 years[1]
- Equal male:female [1]
- Infection (58 – 63 %), atherosclerosis, vasculitis, FMD, pancreatitis[1]
- Trauma and iatrogenic etiologies are also recognized causes [2]

SMA ANEURYSM/PSEUDOANEURYSM

- SMA pseudoaneurysms are mostly asymptomatic
  - 40 – 80 % if untreated[1]
- Rupture – acute intense pain, hemorrhagic shock [1]
- Diagnostic tests: CTA is the study of choice [1]
  - Other options include ultrasound and MRA
- Angiography – should be reserved for endovascular treatment [1]

SMA ANEURYSM/PSEUDOANEURYSM

- SMA aneurysms – should be treated at 1.5 – 2 cm OR if symptomatic OR female patient in fertile age [1]
- SMA pseudoaneurysm – all should be treated regardless of size of patient's condition[1]

- Treatment:
  - Surgery – treatment of choice in low risk patients [3]
  - Endovascular approach – treatment of choice in high risk patients [3]
    - Stents (bare or covered) – in all types [1]
    - Some have used coils, cyanoacrylate – proximal and saccular aneurysms, pseudoaneurysms (controversial) [1]
    - Transluminal Thrombin injection [4]
    - Combo [1]

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2. Au-Yong I, Watson NF, Boereboom CL, Bowling TE, Abercrombie JF, Whitaker SC. Endovascular treatment of a Superior Mesenteric Artery Syndrome variant secondary to traumatic pseudoaneurysm. World J Emerg Surg. 2010;5:7. doi:10.1186/1749-7922-5-7.

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4. Szopiński P[1], Ciostek P, Pleban E, Iwanowski J, Serafin-Król M, Marianowska A, Noszczyk W. Percutaneous thrombin injection to complete SMA pseudoaneurysm exclusion after failing of endograft placement. Cardiovasc Intervent Radiol. 2005 Jul-Aug;28(4):509-14.