CAIR Case of the Month

Case courtesy of Drs. A. Dalton, R. Gullipalli, A. Major, and D. Harrington

Memorial University

Case Presentation

- 69 year old female presenting with ”vague” upper abdominal pain
- Abdominal ultrasound revealed a 5.7 cm abdominal aortic aneurysm

Our patient

- **Past medical history**
  - Hypertension
  - Gastroesophageal reflux disease
  - Hyperlipidemia
  - COPD
  - Anxiety

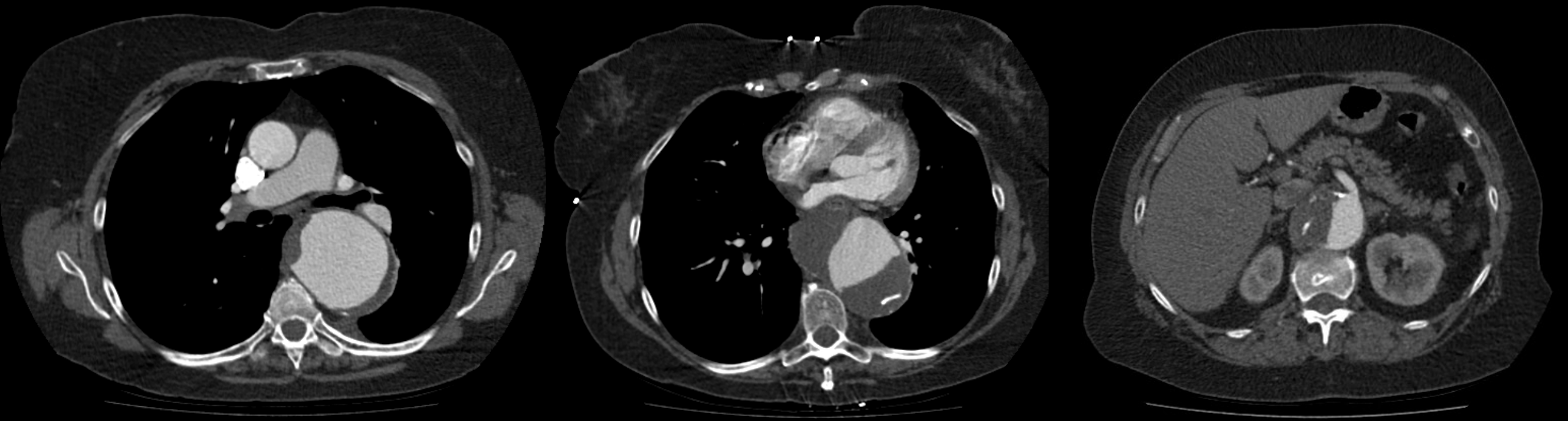
- **Medications**
  - Nifedipine
  - Metoprolol
  - Crestor
  - ASA
  - Buscopan
  - Pariet
  - Ativan
  - Symbicort
  - Ventolin

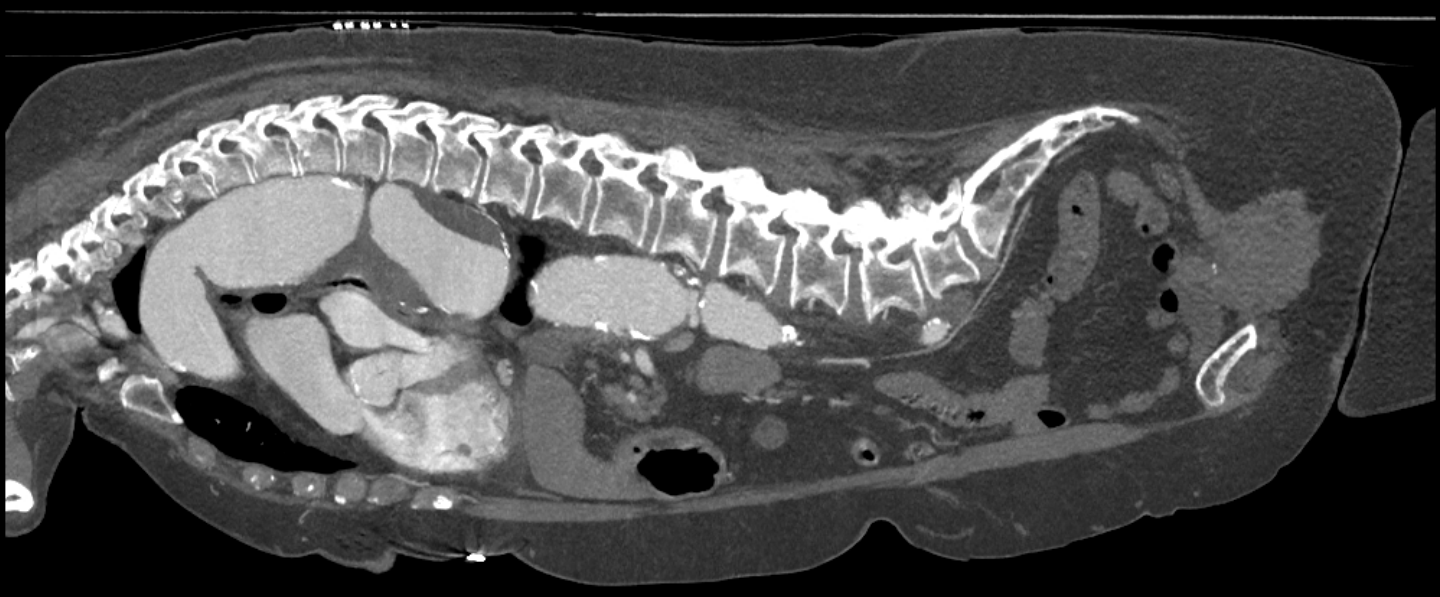
Our patient

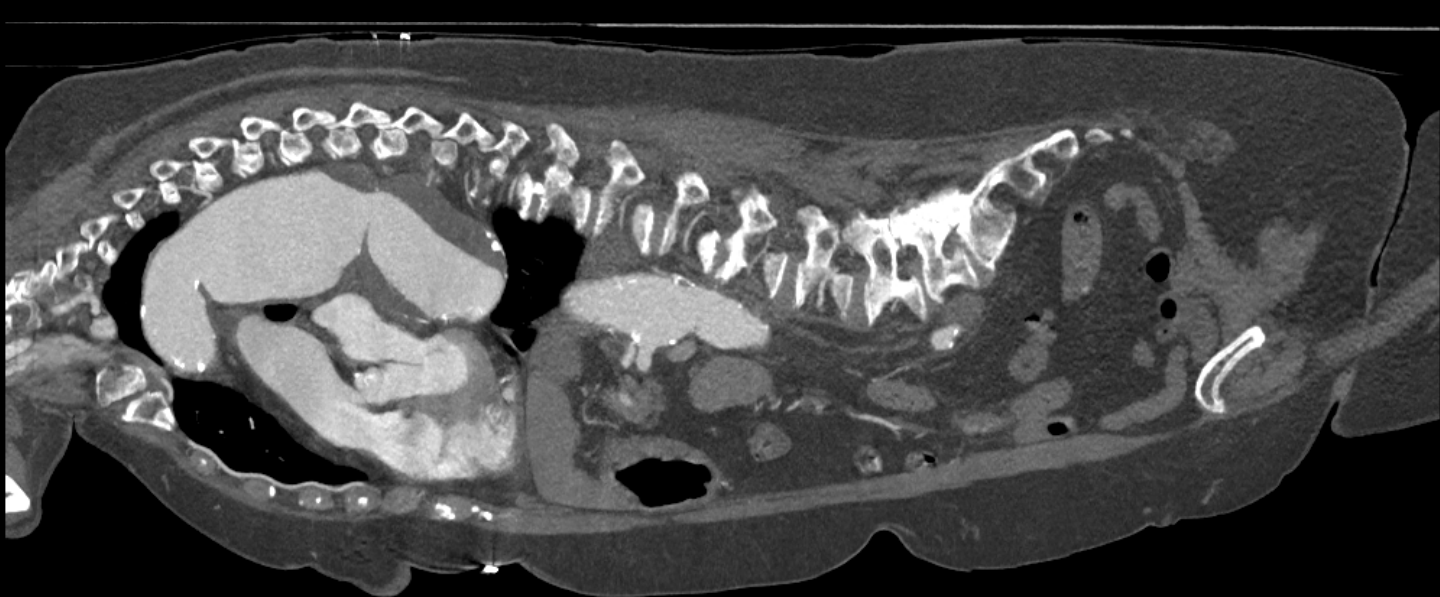
- Significant smoking history
- No alcohol
- No significant family history

- Bloodwork
  - CBC normal
  - Liver/Renal normal
  - Coagulation normal

Initial CT





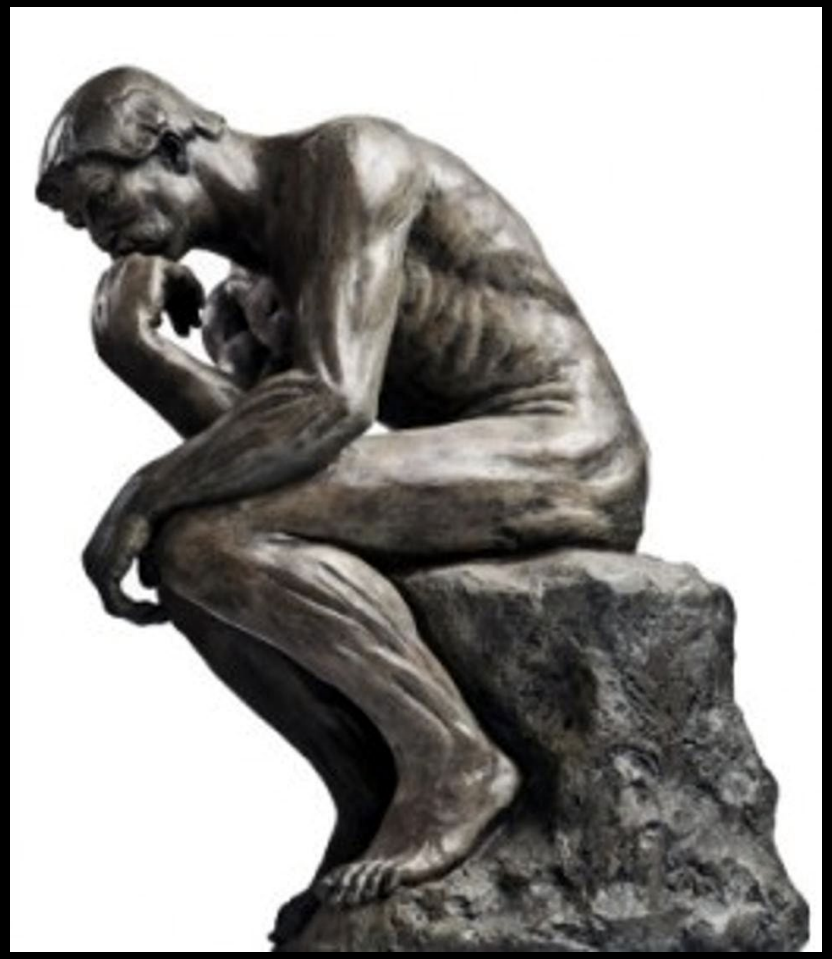


CT Findings

- Torturous thoracic aorta measuring up to 7 cm
- Starts 4 cm distal to left subclavian artery
- Terminates at the level of the renal arteries
- Severe stenosis of the celiac trunk
- Proximal abdominal aorta measures up to 5.3 cm

Initial plan

- Referred to vascular surgery
- Options reviewed with patient
- Not a good surgical candidate
- Decided on a two part plan
  - Repair thoracic part
  - Repair abdominal part
  - Endovascular approach for both



Stage 1 - TEVAR

- Right common femoral puncture
- Stiff wire and 6-French sheath
- Pigtail advanced to the aortic arch
- Left femoral puncture
- Stiff wire and DAV catheter

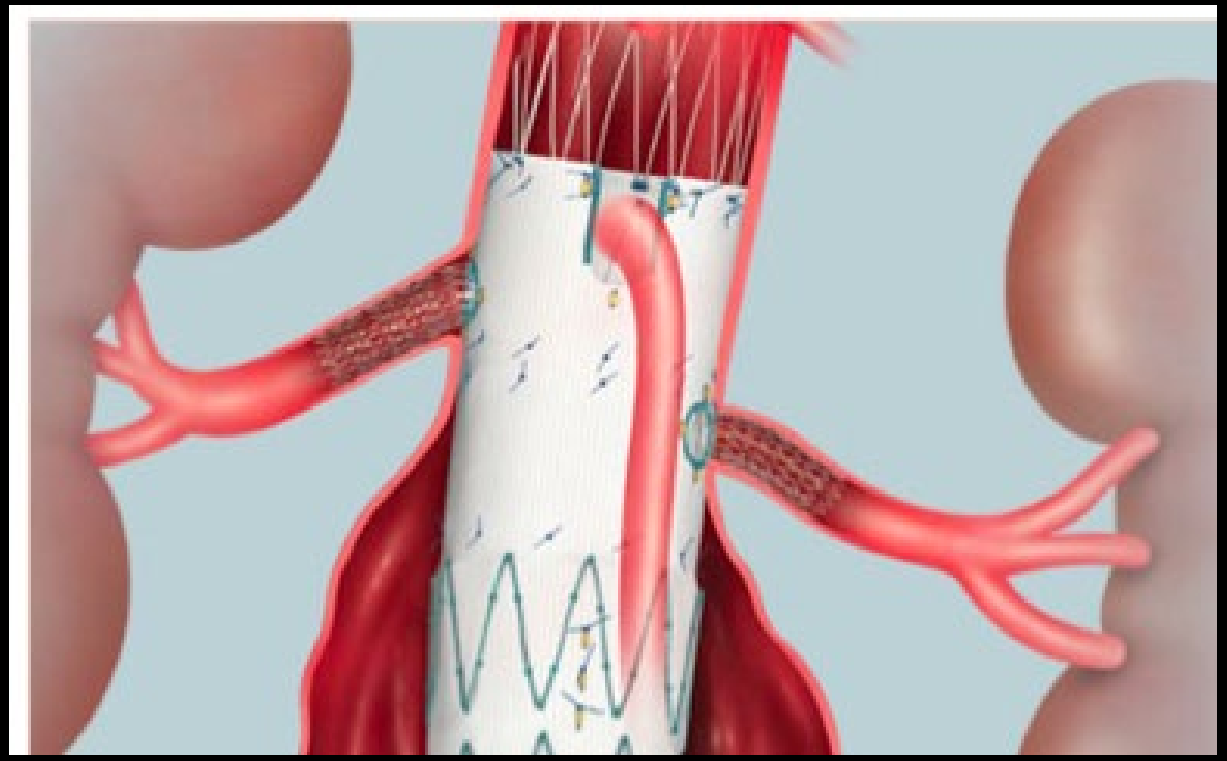
- Proximal aspect deployed just distal to the left subclavian artery

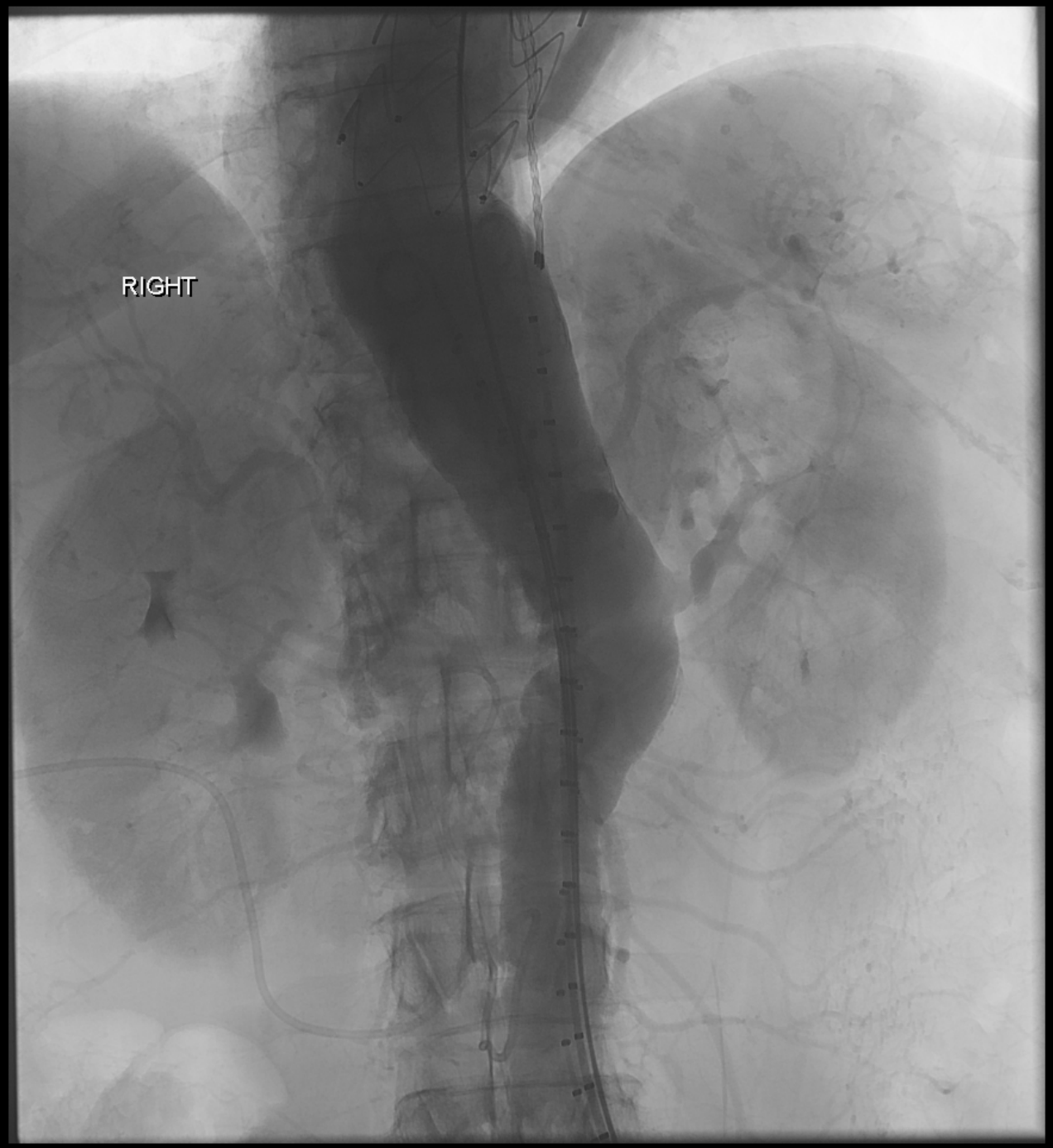
- Distal aspect deployed 5 cm proximal to the celiac trunk
- No evidence of endoleak

Stage 2 – Custom Fenestrated Graft

Stage 2

- Custom fenestrated graft for the abdominal component
  - Celiac and SMA fenestrations
  - Two renal artery fenestrations





- Bilateral femoral cut down
- On the left, two 6 French sheaths with stiff wire and pigtail catheter
- On the right, stiff wire and DAV catheter


[H]
RIGHT
[F]

- Successful cannulation of the SMA
- Celiac occluded

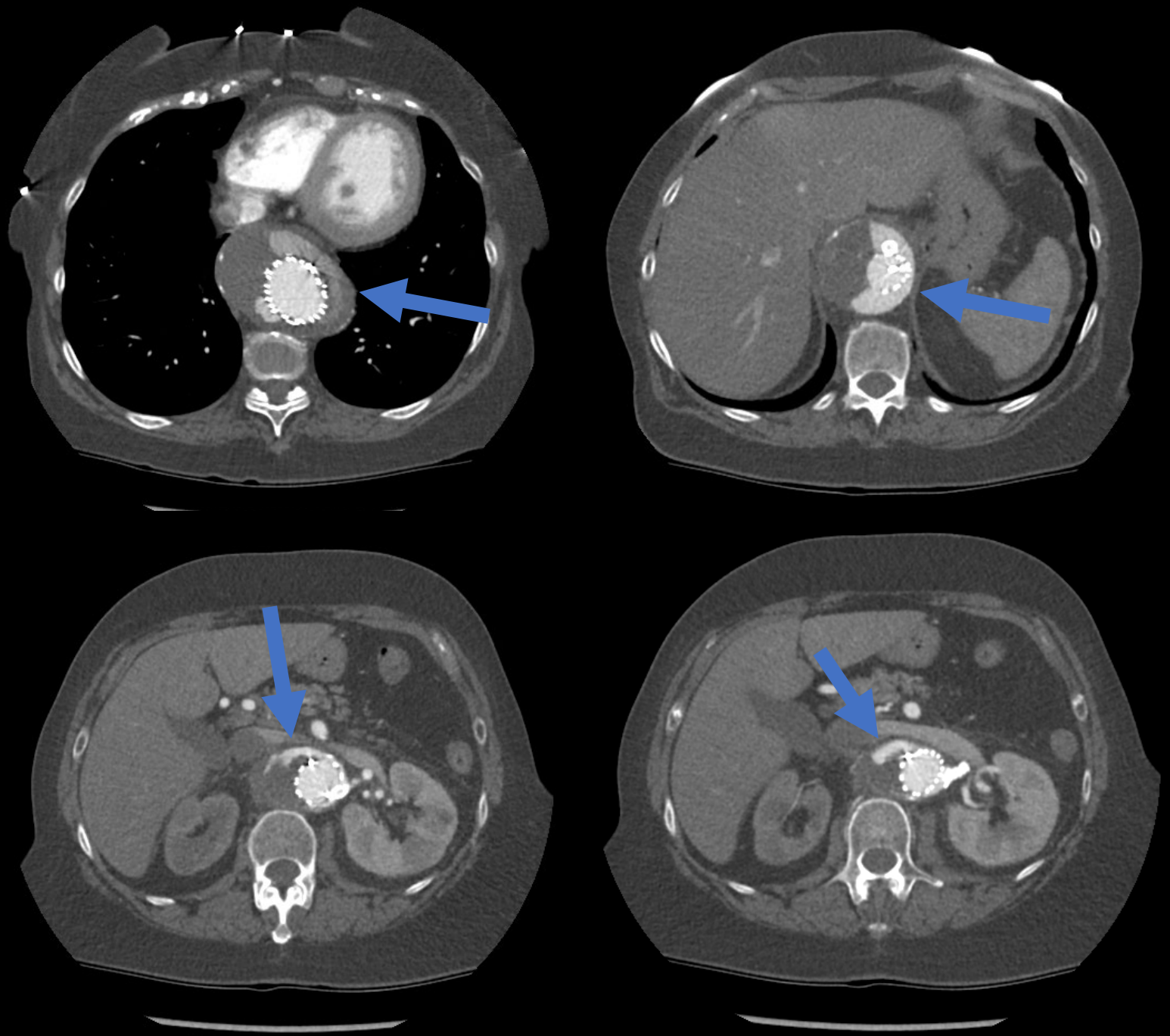
- Successful cannulation of the left renal fenestration

- Multiple unsuccessful attempts to cannulate the right renal fenestration
- Upon deployment the graft had slightly rotated
- Attempts were made from a brachial approach and a femoral approach
- Decision was made to revisit at a later date due to length of procedure and total radiation dose

Follow-up

- Expected type III endoleak
- Patient did not want further intervention
- Decision was made to follow this with repeat CT angiogram

Follow-up CT



- Expected type III endoleak from right renal fenestration

Continued follow-up

- Patient decided they wanted further intervention
- Several options were discussed
  - Covered stent
  - Open repair
  - Bypass to right renal artery from below
  - Another attempt to cannulate the right renal fenestration

Decision

- Case was discussed in vascular rounds
- Attempt to cannulate the right fenestration was decided
- This would sacrifice the right kidney

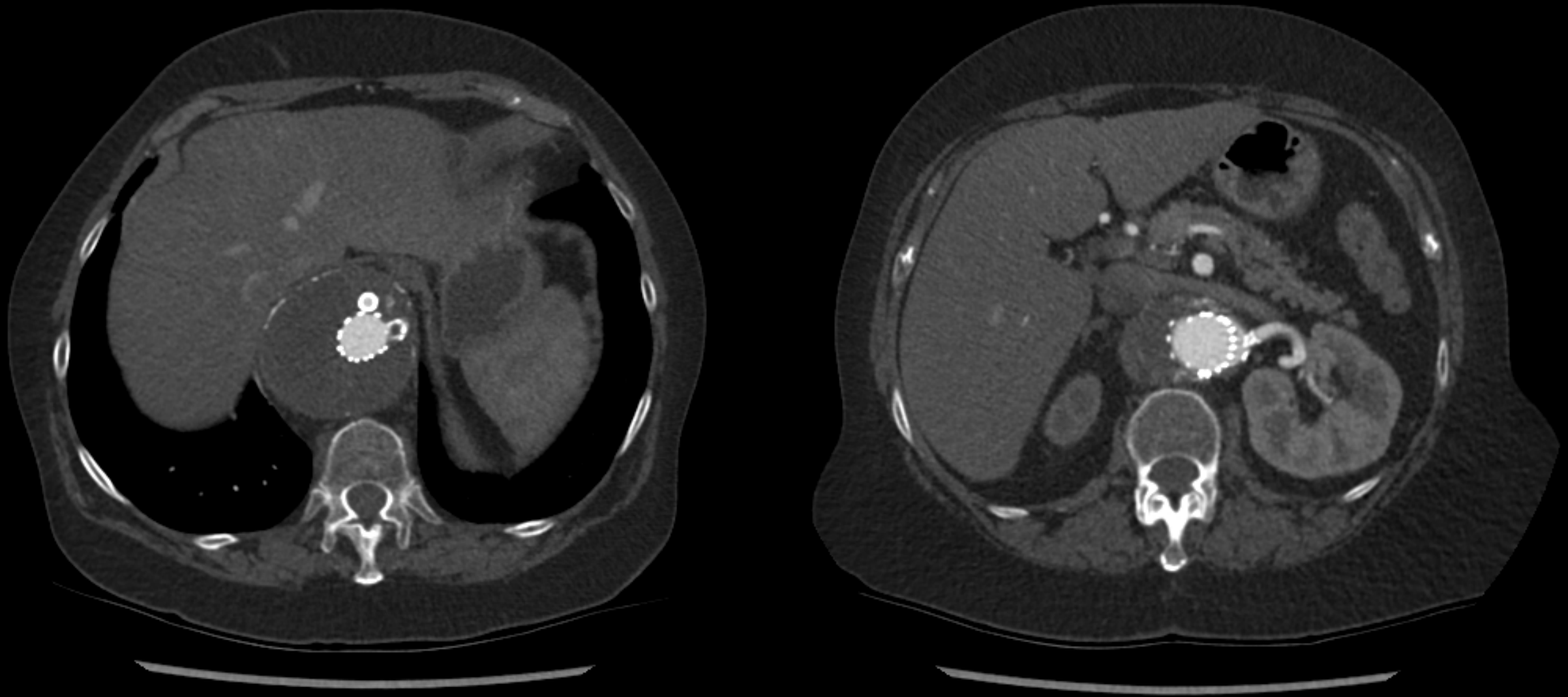
Endoleak repair

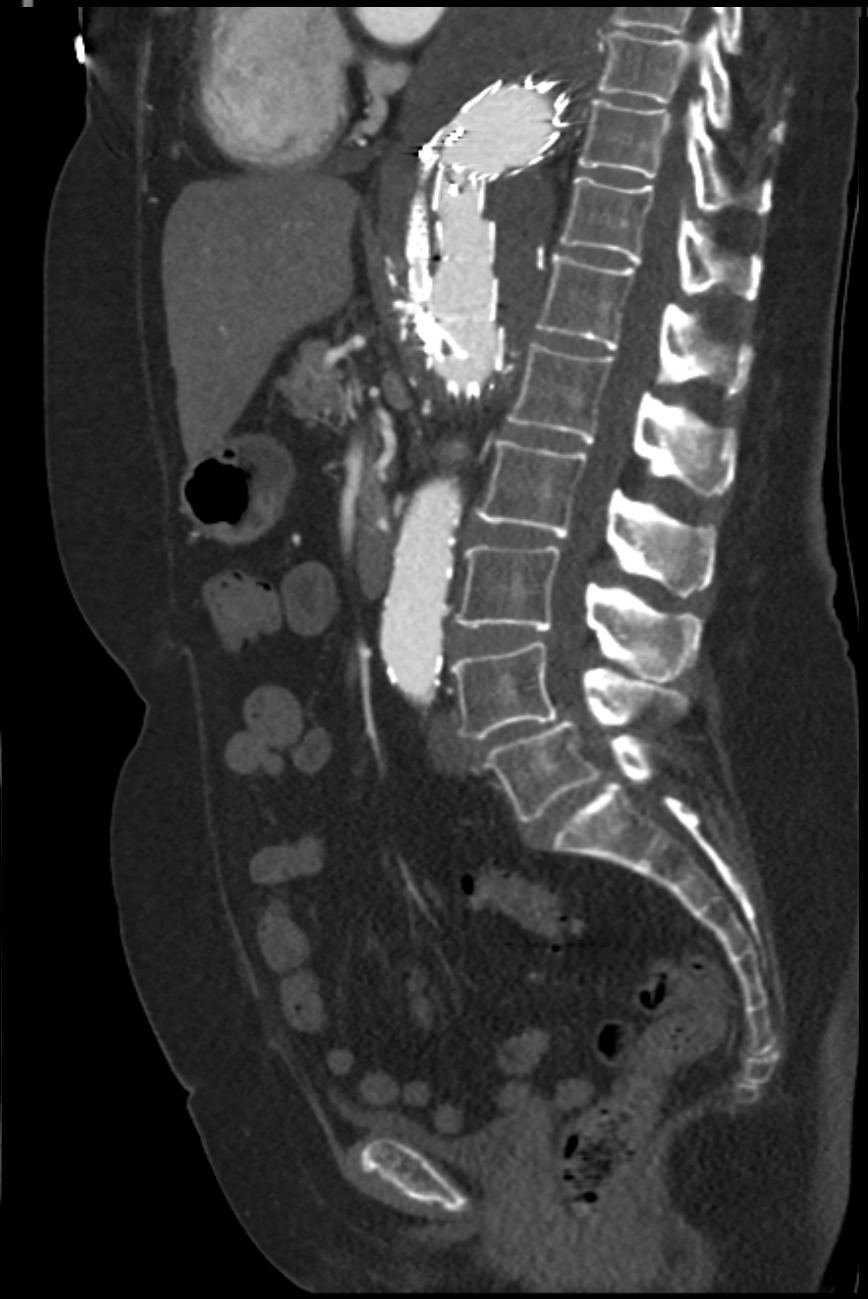
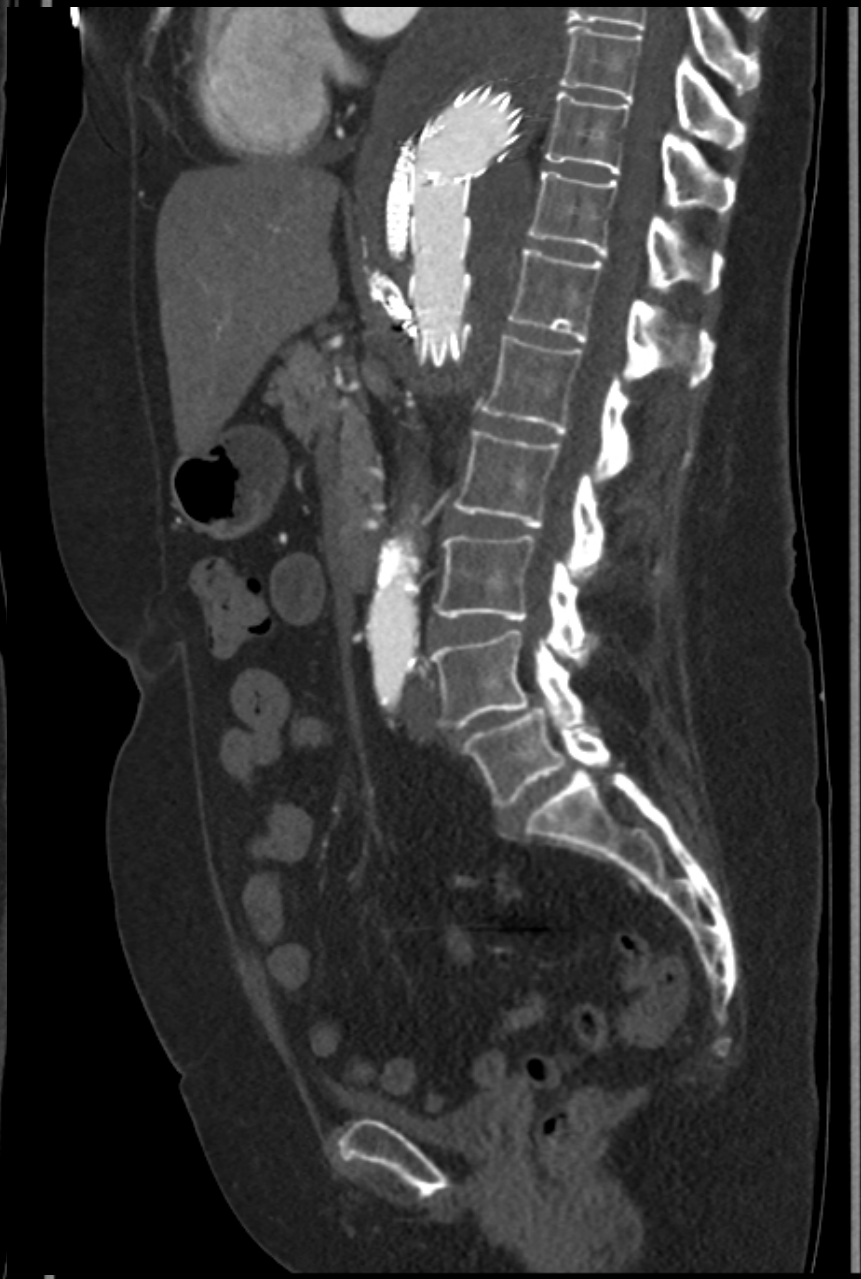
- Right renal fenestration successfully cannulated from a femoral approach
- VS reverse curve catheter

Stent successfully placed

- 3 Amplazter plugs
- 1 coil
- Marked reduced flow into the aneurysmal sac

Final Follow-up



Findings

- Successful embolization of the right renal fenestration
- Had to sacrifice the right kidney
- Renal function remained normal throughout

Summary

- Complex thoracoabdominal aortic aneurysm
- Treated with a two-stage approach
  - Stage 1: TEVAR
  - Stage 2: Custom fenestrated repair
- Complicated by slight rotation during deployment
- Type III endoleak was repaired using a stent, Amplatzer plugs, and a coil

Take home message

- Fenestrated cases can be very complex
- Deployment is critical step
- Malpositioned graft can lead to significant endoleak