AN UNCOMMON CAUSE OF MASSIVE HEMATURIA

Resident(s): Monzer Chehab, MD, Alexander Copelan MD

Attending(s): Purushottam Dixit, MD

Program/Dept(s): Oakland University William Beaumont School of Medicine
CHIEF COMPLAINT & HPI

- Chief Complaint:
  - Fatigue, bloody urine, bleeding per rectum.

- History of Present Illness
  - 70 year old female admitted for intermittent hematuria within her indwelling Foley catheter and bleeding per rectum. The patient was found to be anemic and in acute kidney injury. Following resuscitation and blood transfusion, endoscopy, cystoscopy and vaginal exam failed to reveal source of bleeding.
RELEVANT HISTORY

• Past Medical History
  • Chronic disability from remote orthopedic injuries.
  • Recurrent nephrolithiasis managed by indwelling ureteral stents.
  • Fistula between urinary bladder and rectal pouch with indwelling Foley catheter.

• Past Surgical History
  • Colostomy with rectal pouch secondary to remote diverticulitis.
  • Remote history of uterine cancer treated with surgery and radiation.
DIAGNOSTIC WORKUP

- Non-Invasive Imaging
  - Non contrast CT
  - Tc99m tagged RBC scan
DIAGNOSTIC WORKUP - NON CONTRAST CT

- Non-contrast CT:

Coronal images from a non contrast CT obtained on the day of admission (A) demonstrates right sided hydronephrosis (yellow arrow) with interval migration of the indwelling right ureteral stent into the proximal ureter compared to prior study from 2011 (B).
DIAGNOSTIC WORKUP - BLEEDING SCAN

- Tc99m tagged RBC scan:

Tc99m tagged RBC scan in coronal plane demonstrates nonspecific radiotracer accumulation in right upper quadrant (circle) and region of rectal pouch (arrow).
The patient was brought to the IR suite and contrast was injected through a catheter placed in the right common femoral artery. What structures are opacified by the contrast (arrows)? Click one of the following answers:

A. **Right internal iliac artery and branches**
B. **Right external iliac artery and branches**
C. **An arteriovenous malformation with early draining veins**
D. **Right ureter and bladder**
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Digital Subtraction Angiogram obtained during contrast injection through a C2 catheter. The distal tip of the catheter was in the proximal right external iliac artery (curved arrow) over a V18 wire coiled within the urinary bladder (arrowhead). Contrast opacifies the right internal iliac artery (asterix) which was separate from the fistulous communication between the distal right common iliac artery and ureter (arrow).

Digital Subtraction Angiogram obtained during presumed cannulation of the right internal iliac artery via C2 glide catheter from a right common femoral artery approach. Instead of opacification of the right internal iliac artery, contrast was noted to opacify a tubular structure identified as the right ureter (arrow). Contrast is also evident in the urinary bladder (asterix). Contrast spilled onto the angiography table from her rectum, presumably through her known colovesicular fistula.
DIAGNOSIS

- Ureteroarterial fistula.
INTERVENTION

- Embolization and endovascular stent placement.

In anticipation of excluding the ureteroarterial fistula with a covered stent, the right internal iliac artery was embolized using multiple Nester coils (arrow) via a right common femoral artery approach.

 Fluoroscopic spot image immediately following deployment of a Viabahn covered stent (yellow arrows) excluding the embolized right internal iliac artery (white arrow) and nearby ureteroarterial fistula.
What was the rational for embolizing the right internal iliac artery prior to covered stent exclusion of the fistula? Click one of the following answers:

- **A. To prevent formation of an arteriovenous fistula.**
- **B. To prevent a type II endoleak from occurring, from retrograde filling of the common iliac artery between the stent and intima.**
- **C. To prevent formation of a pseudoaneurysm.**
- **D. To prevent a type III endoleak from occurring, from a leak through the graft material.**
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CLINICAL FOLLOW UP

- Hematuria resolved immediately following intervention. Serum creatinine returned to baseline upon discharge 7 days post procedure.
Ureteroarterial fistula is an abnormal communication between an artery (typically common or external iliac) and ureter. It is a rare, potentially fatal cause of hematuria.

Risk factors include: prior pelvic surgery, radiation and ureteral catheterization causing inflammation and weakening of the connective tissues between the arterial and ureteral walls allowing fistulization to occur.

Diagnosis may be elusive on noninvasive imaging as the fistula is prone to recurrent clotting and intermittent bleeding. Intermittent clotting of the fistula prohibits contrast extension from the artery into the ureter.

Selective iliac angiography plays a diagnostic and therapeutic role.

Treatment is best served by covered stent exclusion of the fistula.
REFERENCES AND FURTHER READINGS