

AMSER Case of the Month

April 2024

65-year-old female with abdominal pain, nausea, and left hip pain.

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Patient Presentation

HPI: A 65-year-old female presents as a transfer from the community ED with a chief complaint of a 2-day history of abdominal pain, left hip pain, and nausea. Patient adds that she has had a 3-week history of dizziness, dehydration, and a low-grade fever. Prior to transfer, patient received 3.5L of crystalloid and remained hypotensive. Patient denies recent history of hematochezia.

PMH: Colon cancer s/p resection with adjuvant radiation therapy completed 11 years ago, Left total hip arthroplasty 1 year prior, CKD Stage III; Right hydronephrosis s/p ureteral stent placement

Physical Exam: BP: 90-100 systolic after fluids. Patient appears pale and lethargic. Abdomen is distended and diffusely tender to palpation. Left hip is nonspecifically painful and the left lower extremity is edematous.

Pertinent Labs

- Procalcitonin – 18.11 ng/mL (Normal: ≤ 0.05 ng/mL)
- Lactic Acid – 5.8 mmol/L (Normal: 0.5-2.0 mmol/L)
- Potassium – 2.8 mmol/L (Normal: 3.7-5.1 mmol/L)

- Blood cultures – Positive for E. coli

What Imaging Should We Order?

Variant 1: Chronic hip pain. Initial Imaging.		
Procedure	Appropriateness Category	Relative Radiation Level
Radiography pelvis	Usually Appropriate	☼☼
Radiography hip	Usually Appropriate	☼☼☼
US hip	Usually Not Appropriate	○
Image-guided anesthetic +/- corticosteroid injection hip joint or surrounding structures	Usually Not Appropriate	Varies
MR arthrography hip	Usually Not Appropriate	○
MRI hip without and with IV contrast	Usually Not Appropriate	○
MRI hip without IV contrast	Usually Not Appropriate	○
Bone scan hip	Usually Not Appropriate	☼☼☼
CT arthrography hip	Usually Not Appropriate	☼☼☼
CT hip with IV contrast	Usually Not Appropriate	☼☼☼
CT hip without and with IV contrast	Usually Not Appropriate	☼☼☼
CT hip without IV contrast	Usually Not Appropriate	☼☼☼
Fluoride PET/CT skull base to mid-thigh	Usually Not Appropriate	☼☼☼

ACR Appropriateness Criteria

Pelvis and Left Hip radiographs were obtained initially

Variant 1: Suspected osteomyelitis or septic arthritis or soft tissue infection (excluding spine and diabetic foot). Initial imaging.		
Procedure	Appropriateness Category	Relative Radiation Level
Radiography area of interest	Usually Appropriate	Varies
US area of interest	Usually Not Appropriate	○
MRI area of interest without and with IV contrast	Usually Not Appropriate	○
MRI area of interest without IV contrast	Usually Not Appropriate	○
3-phase bone scan area of interest	Usually Not Appropriate	☼☼☼
CT area of interest with IV contrast	Usually Not Appropriate	Varies
CT area of interest without and with IV contrast	Usually Not Appropriate	Varies
CT area of interest without IV contrast	Usually Not Appropriate	Varies



AP Pelvis Radiograph (unlabeled)

11:49:49 AM

Portable
KVP : 75kV
mAs : 12mAs



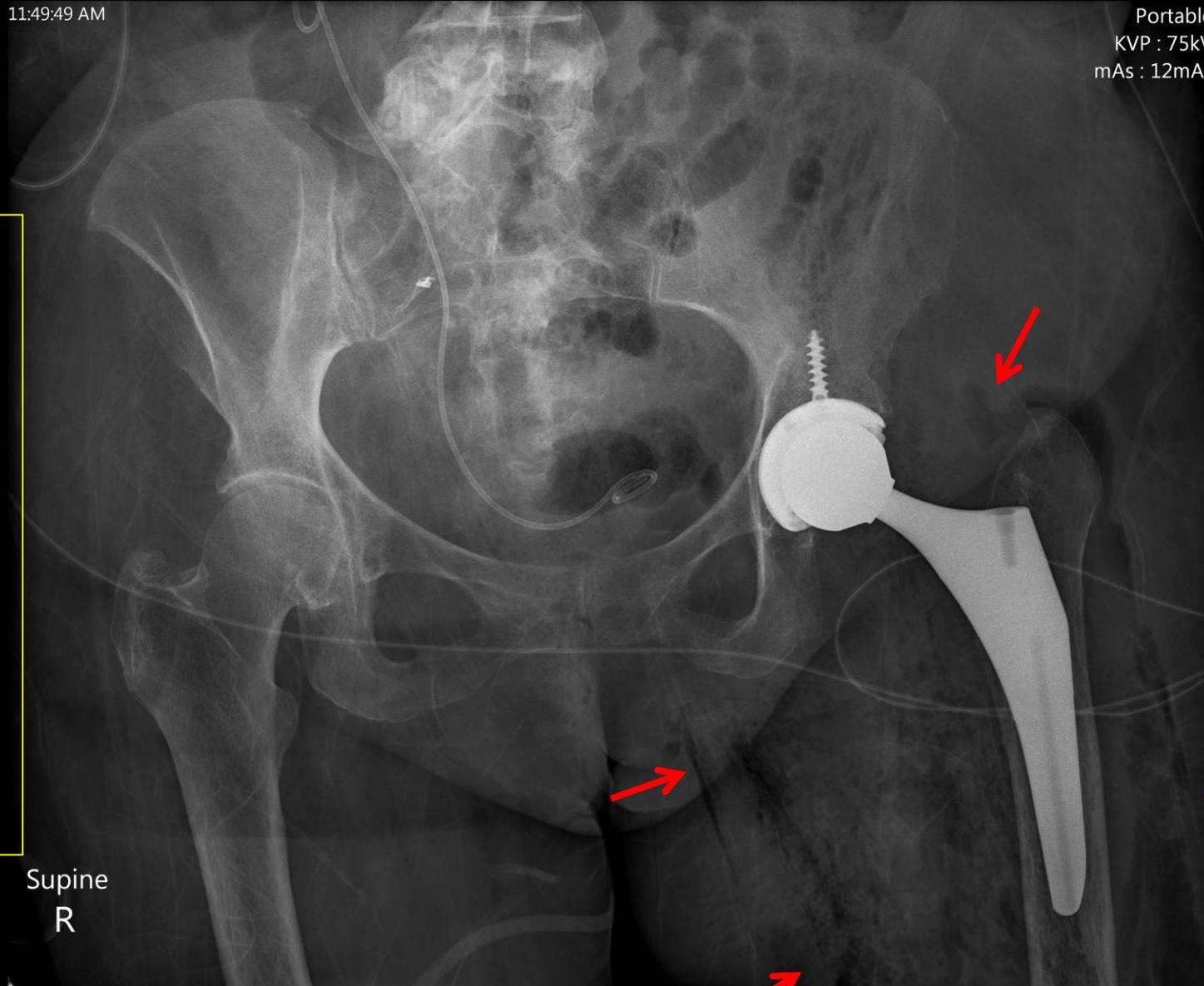
Supine
R

AP Pelvis Radiograph (labeled)

11:49:49 AM

Portable
KVP : 75kV
mAs : 12mAs

- Left total hip arthroplasty
 - Hardware appears intact
 - Soft tissue gas (→) around the left hip and proximal thigh
- Findings suspicious for potential infection (e.g. necrotizing fasciitis, abscess)



Supine
R

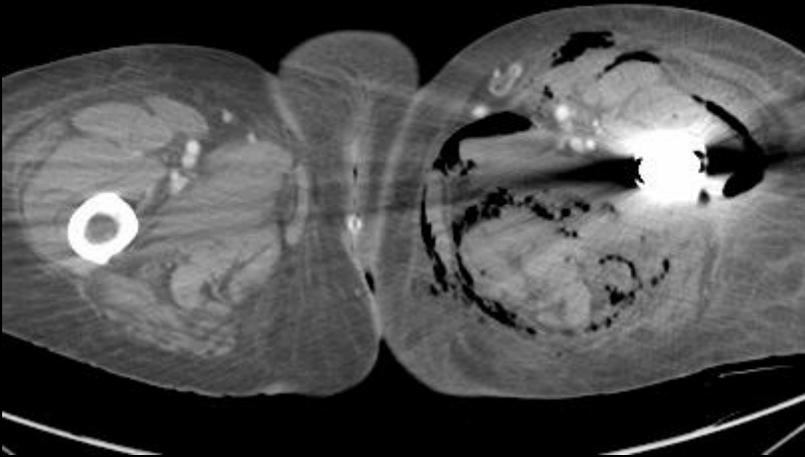
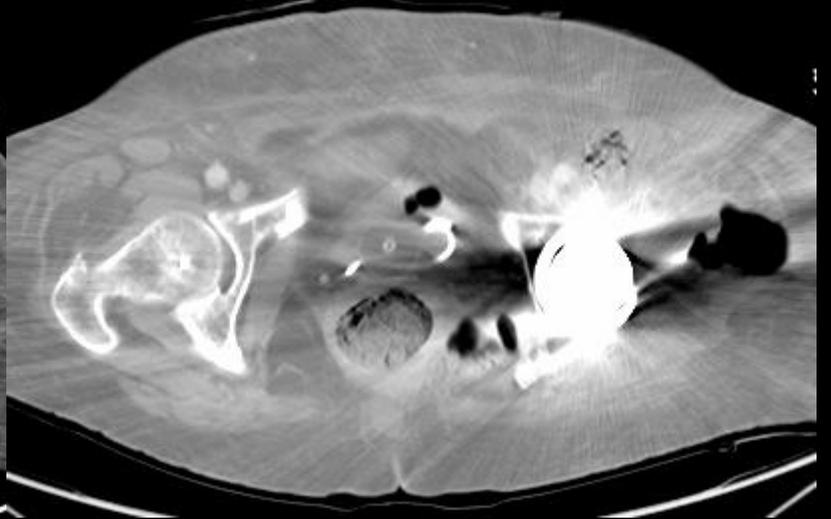
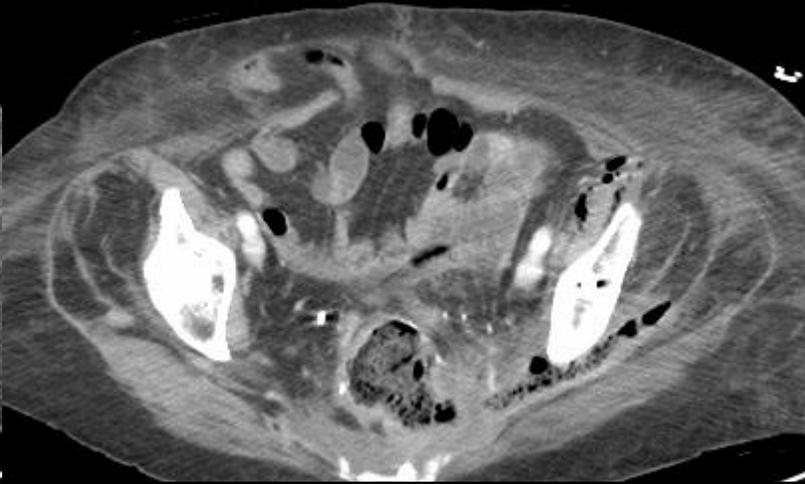
Variant 1:**Acute nonlocalized abdominal pain and fever. No recent surgery. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	⊕⊕⊕
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate	○
US abdomen	May Be Appropriate	○
CT abdomen and pelvis without IV contrast	May Be Appropriate	⊕⊕⊕
MRI abdomen and pelvis without IV contrast	May Be Appropriate	○
CT abdomen and pelvis without and with IV contrast	May Be Appropriate	⊕⊕⊕⊕
Radiography abdomen	May Be Appropriate	⊕⊕
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	⊕⊕⊕⊕
WBC scan abdomen and pelvis	Usually Not Appropriate	⊕⊕⊕⊕
Nuclear medicine scan gallbladder	Usually Not Appropriate	⊕⊕
Fluoroscopy contrast enema	Usually Not Appropriate	⊕⊕⊕
Fluoroscopy upper GI series with small bowel follow-through	Usually Not Appropriate	⊕⊕⊕

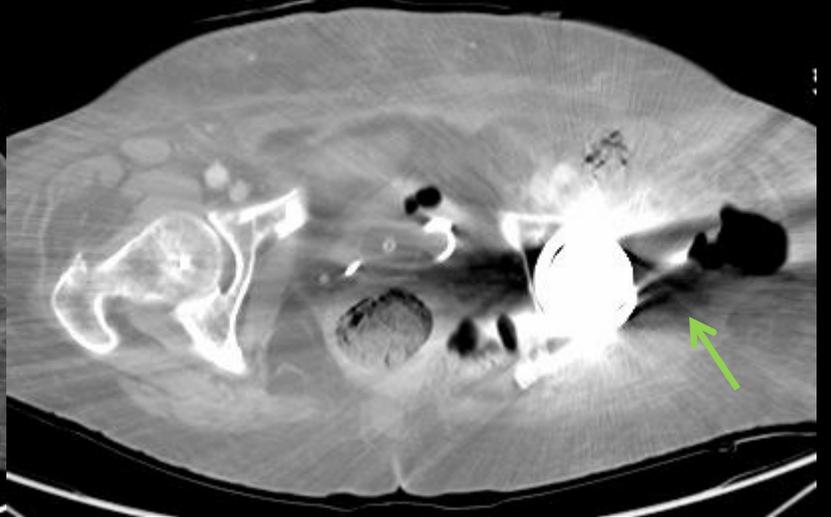
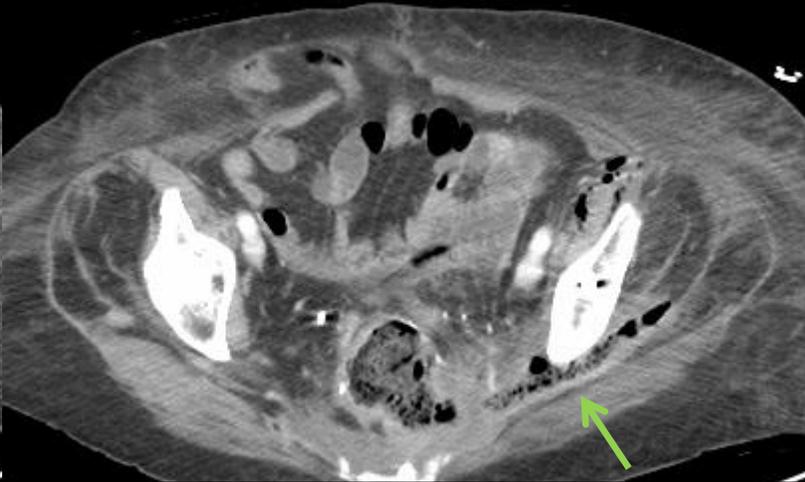
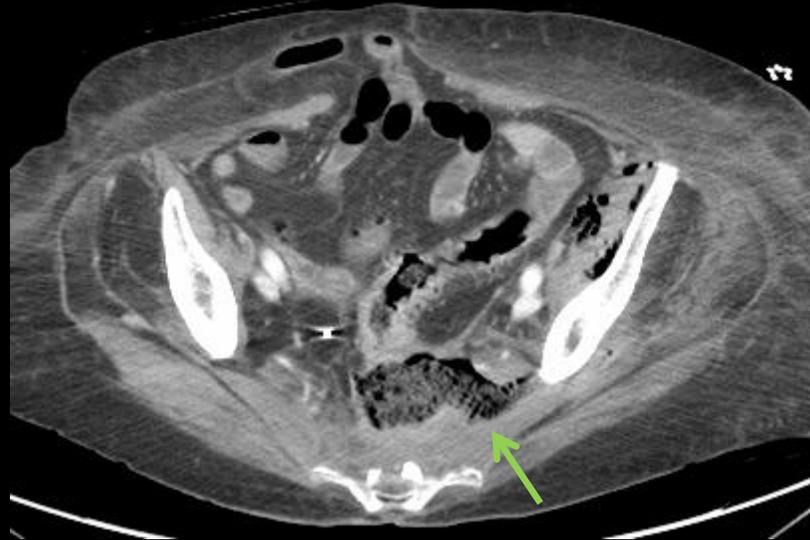
ACR Appropriateness Criteria

CT abdomen and pelvis
obtained to evaluate
abdominal pain and distension

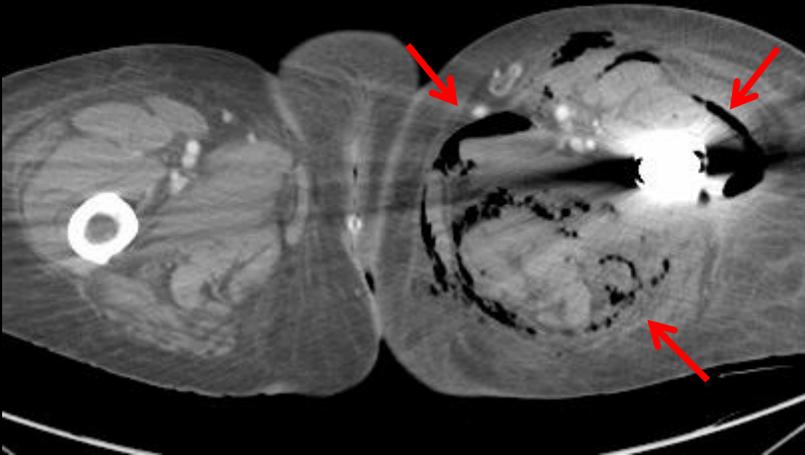
Axial Images from Abdominal/Pelvic CT With Contrast (Unlabeled)



Axial Images from Abdominal/Pelvic CT With Contrast (Labeled)

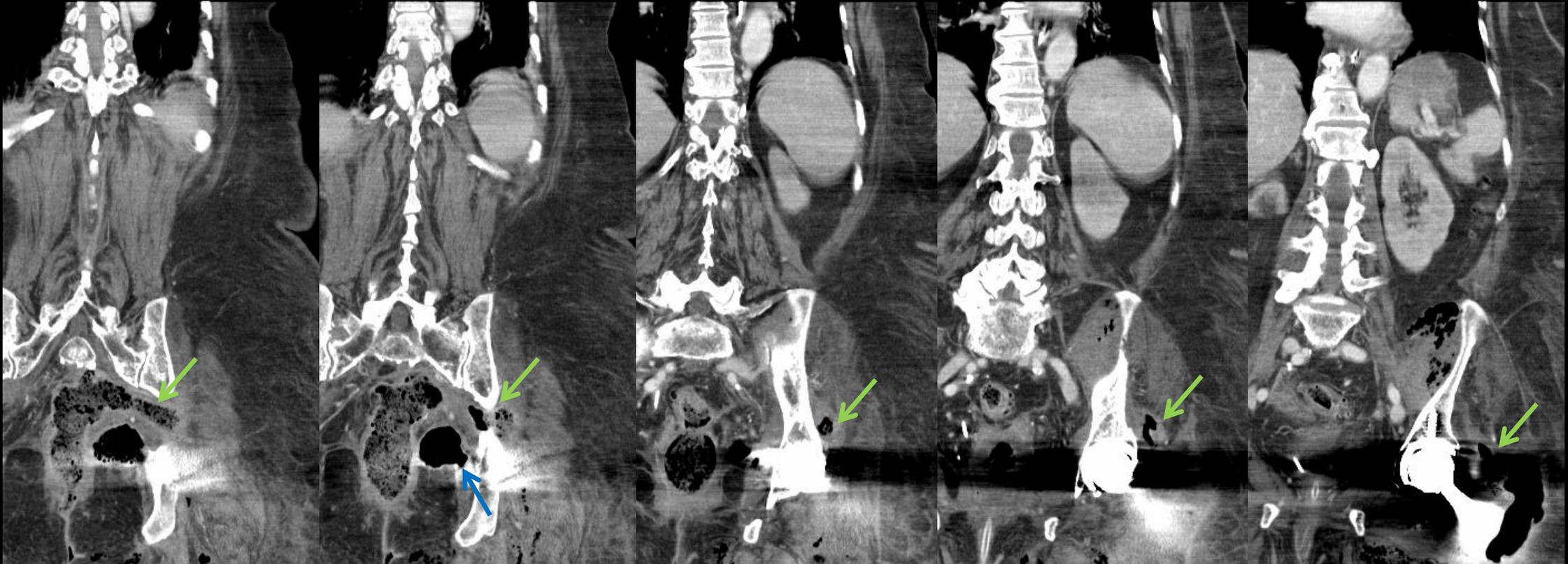


- Rectal perforation with tract (→) extending through the sciatic foramen to a collection along/around the left hip prosthesis



- Soft tissue emphysema (→) throughout the muscles of the proximal thigh

Coronal Images from Abdominal/Pelvic CT With Contrast (Labeled)



- Recto-articular/peri-articular fistula on coronal images (→)
- Separate developing tract along the left peri-anal/levator ani musculature (→)

Final Dx:

Left hip recto-articular/peri-articular fistula formation

Case Discussion

- Colo-articular fistula or recto-articular fistula is a rare but serious complication of total hip arthroplasty that occurs when an aberrant tract is formed between the bowel and hip hardware [1].
- Defects in the bowel and fistula formation can result in sepsis, from bacterial infiltration into the abdomen or the joint space.
- Etiology of colo-articular fistulas is most likely multifactorial with the associated risk factors being long-term steroid use, radiation therapy, and local wound necrosis [1,2].

Case Discussion

- This patient underwent pelvic radiation as an adjuvant therapy for rectal cancer 11 years earlier, which may have contributed in part to the formation of the recto-articular fistula.
- Irradiated tissue is replaced by more fibrous and dense tissue which can cause radiation proctitis progressing to fistula formation [3].
- CT findings in the pelvis after radiation therapy may include presacral soft tissue thickening as well as chronic bowel or bladder wall thickening [3,4].

Case Discussion

- There are very few recorded cases of colo-articular fistulas, but the treatment course involves management similar to other colonic fistulas, e.g. complicated rectovaginal fistulas, as well as treatment for joint infection.
- Colostomy is usually indicated to prevent to prevent future infections and continued fistula formation due to damaged tissue/ongoing infection.
 - This patient received a permanent colostomy during the hospitalization.
- Joint irrigation and debridement should take place as soon as possible to prevent further infection and necrosis of tissue. Resection of the fistulous tract may be necessary. In the setting of an infected joint prosthesis, revision arthroplasty is often required.
 - This patient underwent 3 separate rounds of irrigation and debridement during the hospitalization.
 - The patient was discharged on hospital day 41 with plan for follow-up ostomy and thigh wound care.
- Several months later, she underwent hip prosthesis explantation, antibiotic spacer placement, and subsequently revision hip arthroplasty.

References:

1. Bach, Christian Michael, et al. "Intrapelvic Complications after Total Hip Arthroplasty Failure." *The American Journal of Surgery*, vol. 183, no. 1, Jan. 2002, pp. 75–79. ScienceDirect, [https://doi.org/10.1016/S0002-9610\(01\)00845-5](https://doi.org/10.1016/S0002-9610(01)00845-5).
2. Iyer, Revathy B., et al. "Imaging Findings After Radiotherapy to the Pelvis." *American Journal of Roentgenology*, vol. 177, no. 5, Nov. 2001, pp. 1083–89. DOI.org (Crossref), <https://doi.org/10.2214/ajr.177.5.1771083>.
3. Levin, Jared S., et al. "Fistula between the Hip and the Sigmoid Colon after Total Hip Arthroplasty. A Case Report*." *JBJS*, vol. 79, no. 8, Aug. 1997, p. 1240. journals.lww.com, https://journals.lww.com/jbjsjournal/citation/1997/08000/fistula_between_the_hip_and_the_sigmoid_colon.18.aspx.
4. VanBuren, Wendaline M., et al. "Imaging and Surgical Management of Anorectal Vaginal Fistulas." *RadioGraphics*, vol. 38, no. 5, Sept. 2018, pp. 1385–401. DOI.org (Crossref), <https://doi.org/10.1148/rg.2018170167>.