AMSER Case of the Month September 2023

20-year-old female with redness and swelling of right buttock

WASHINGTON STATE UNIVERSITY
Elson S. Floyd College of Medicine

Bailey Hall, MS3
WSU Elson S. Floyd College of Medicine

Dr. Julie Kaczmark, MD
Inland Imaging

Inland Imaging

AMSER

Patient Presentation

HPI: 20-year-old female presents to the ED for worsening pain and drainage from right buttock. Patient states the pain is severe and located around the anus though difficult to localize exactly where the pain is coming from. She was evaluated by her PCP 3 days prior for severe right buttock pain of about 10 days duration and was prescribed Bactrim. She has since had persistent, worsening pain now accompanied by drainage of a foul-smelling liquid. Patient endorses fatigue, malaise, and dyschezia. She is not sexually active. Denies nausea, fever, chills, dysuria, constipation, hematochezia, abdominal or back pain, or involvement of the perineum or genitalia.

PMHx: Obesity (BMI 39.9), Irregular menses

Vitals: BP 106/82, HR 152, RR 18, SpO2 97% RA, T 36.1°C

PE: Tachycardic, normal rhythm without murmurs. No respiratory distress or peritoneal signs. Region of induration and erythema with central fluctuance over right gluteal region just lateral to cleft, tender to palpation and draining a purulent brown thin fluid.

Pertinent Labs

CBC
WBC: 22.81 (H)
%Bands: 17 (H)
ANC: 15.74 (H)
RBC: 4.55
Hb: 12.4
Hct: 37.5
Plt: 257

CMP
Na: 130 (L)
K: 2.9 (L)
Cl: 94 (L)
CO2: 26
Anion Gap: 10
Glucose: 560 (H)
Creatinine: 0.77
Alk Phos: 215 (H)
AST: 75 (H)
ALT: 62

Cultures
Blood: No growth
Urine: No growth

Other
Lactate: 3.7 (H)

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

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	O
MRI area of interest without and with IV contrast	Usually Not Appropriate	O
MRI area of interest without IV contrast	Usually Not Appropriate	O
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

This imaging modality was ordered by the ER physician

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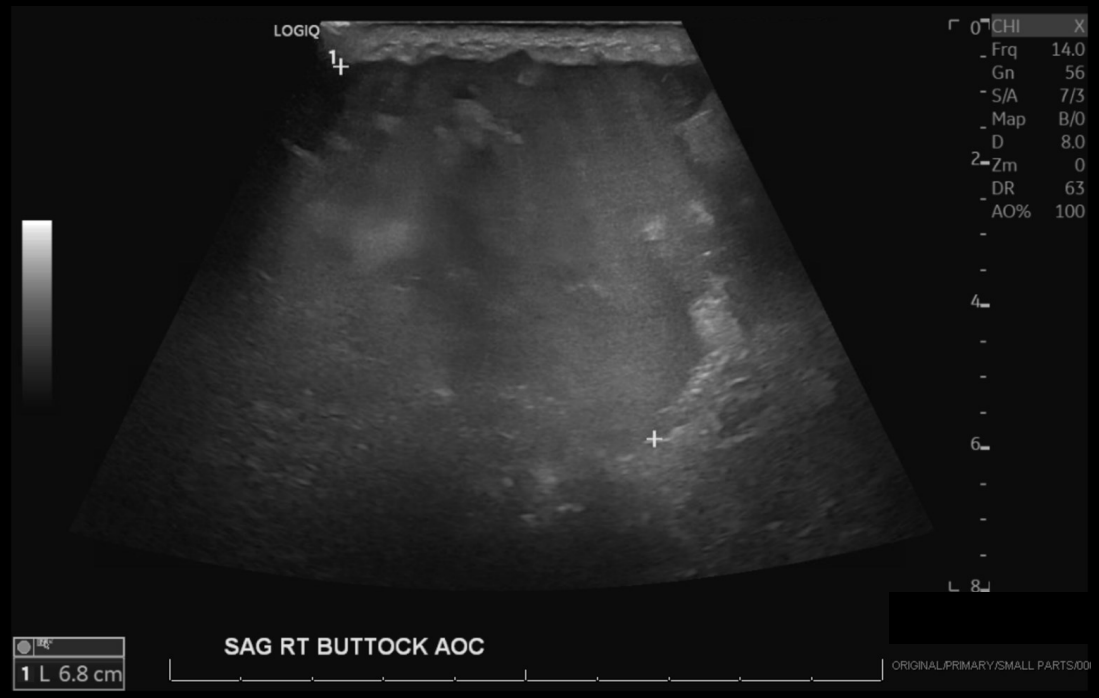
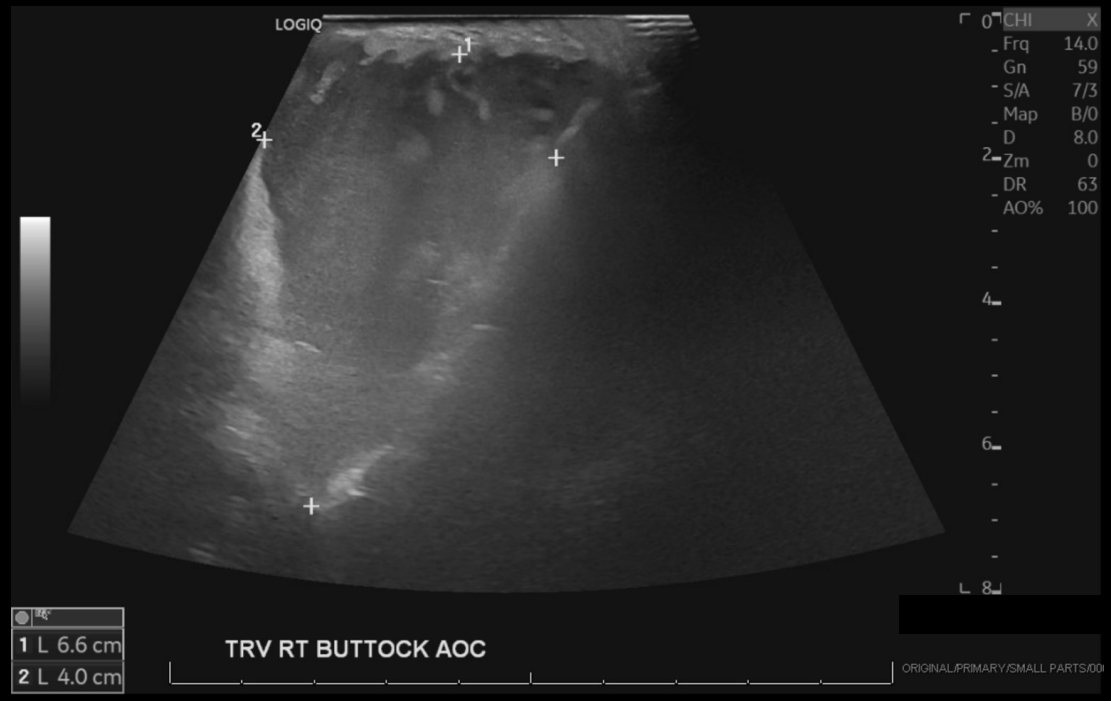
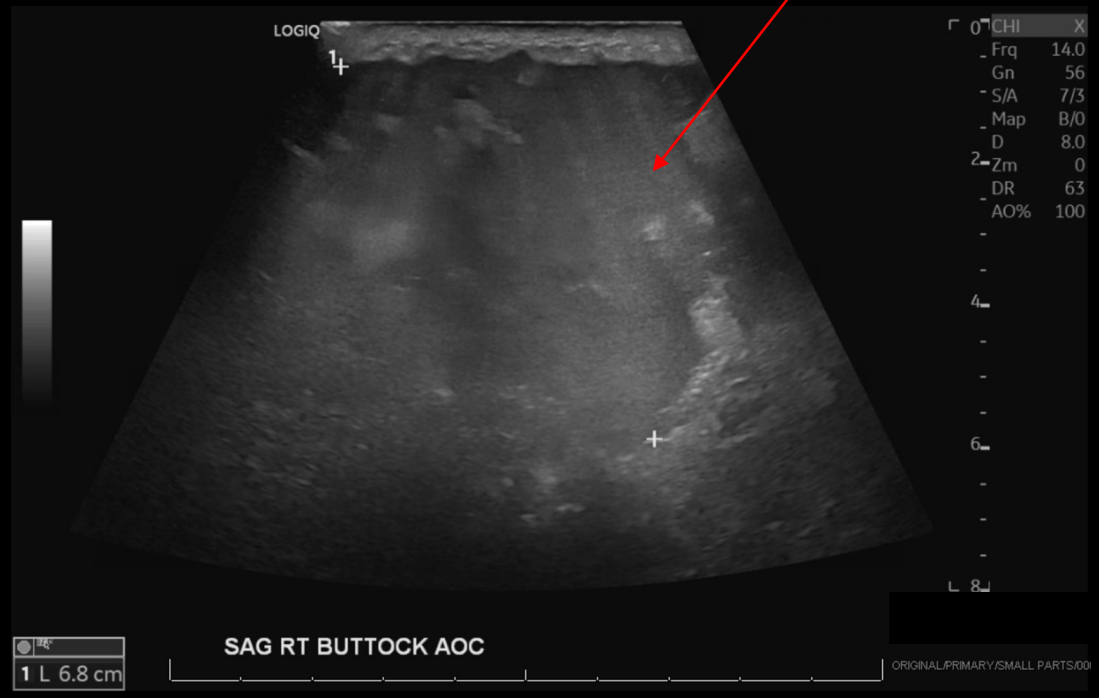
Ultrasound Findings:

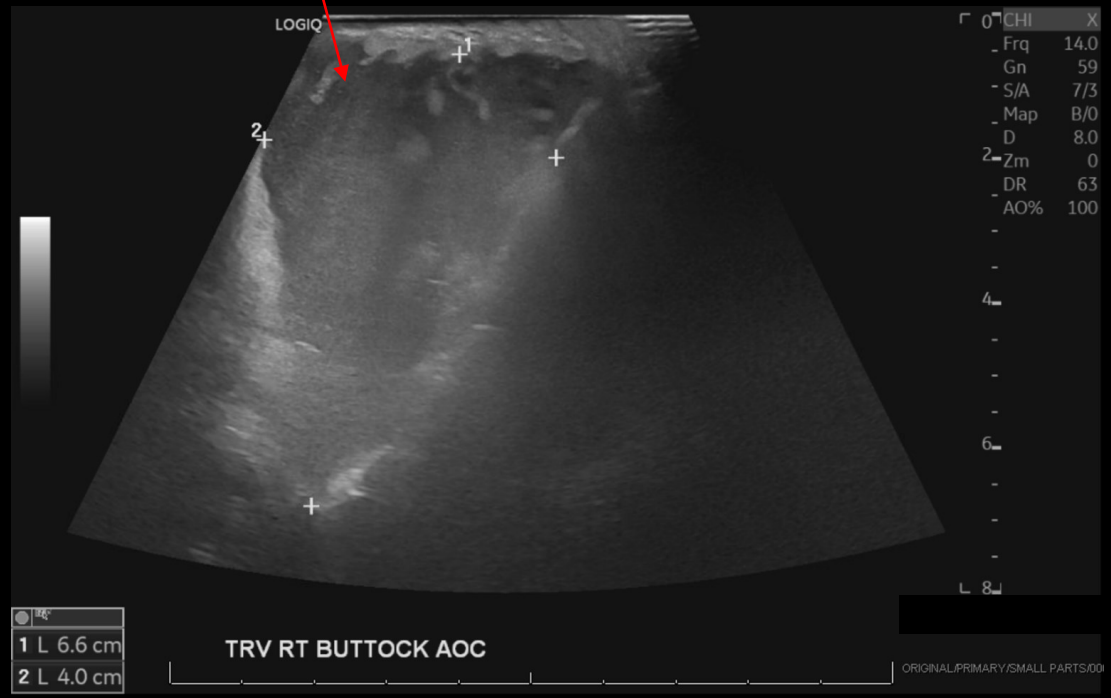




Ultrasound Findings:

Complex fluid collection in right gluteal region measuring at least 6.8 cm





What Follow-Up Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 7: **Suspected soft tissue infection. Initial radiographs show soft tissue gas (without puncture wound) or are normal with high clinical suspicion of necrotizing fasciitis. Next imaging study.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI area of interest without and with IV contrast	Usually Appropriate	O
MRI area of interest without IV contrast	Usually Appropriate	O
CT area of interest with IV contrast	Usually Appropriate	Varies
CT area of interest without IV contrast	Usually Appropriate	Varies
US area of interest	May Be Appropriate	O
CT area of interest without and with IV contrast	Usually Not Appropriate	Varies

This imaging modality was ordered by the ER physician

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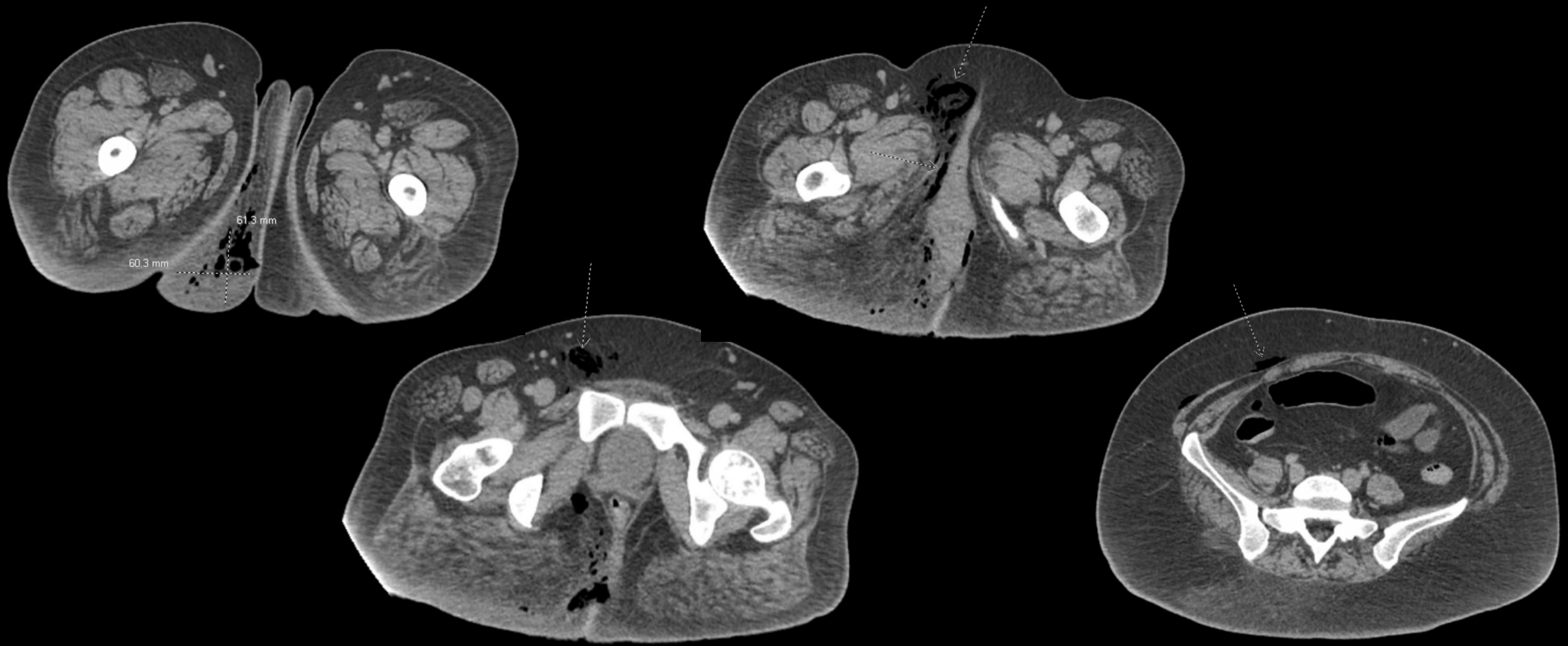
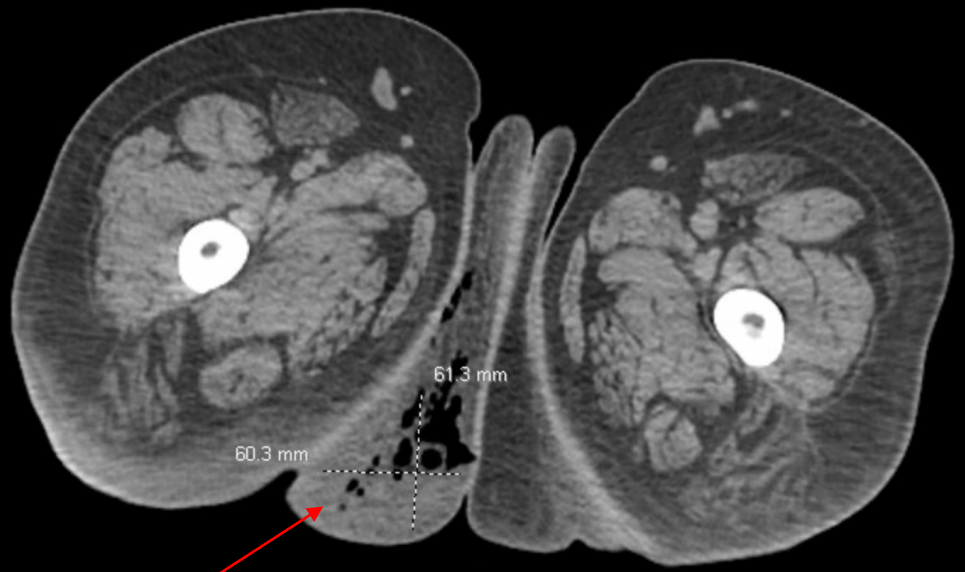
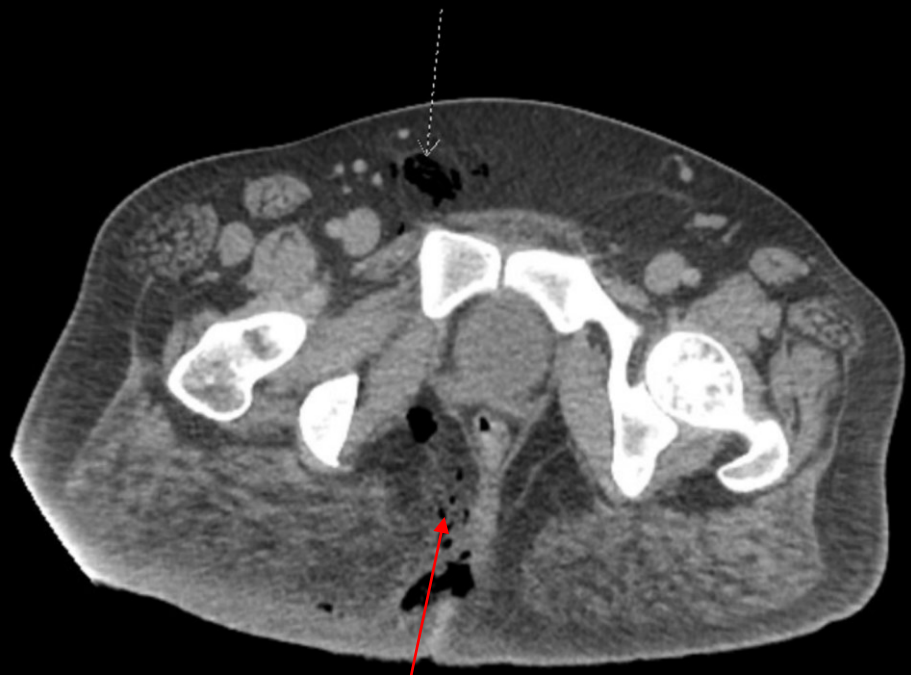
CT Abdomen/Pelvis - venous phase, axial



CT Abdomen/Pelvis - venous phase, axial



Heterogeneous area of gas and complex fluid in right inferior medial gluteal region and perineum



Right ischiorectal fossa soft tissue inflammation and infiltrative gas

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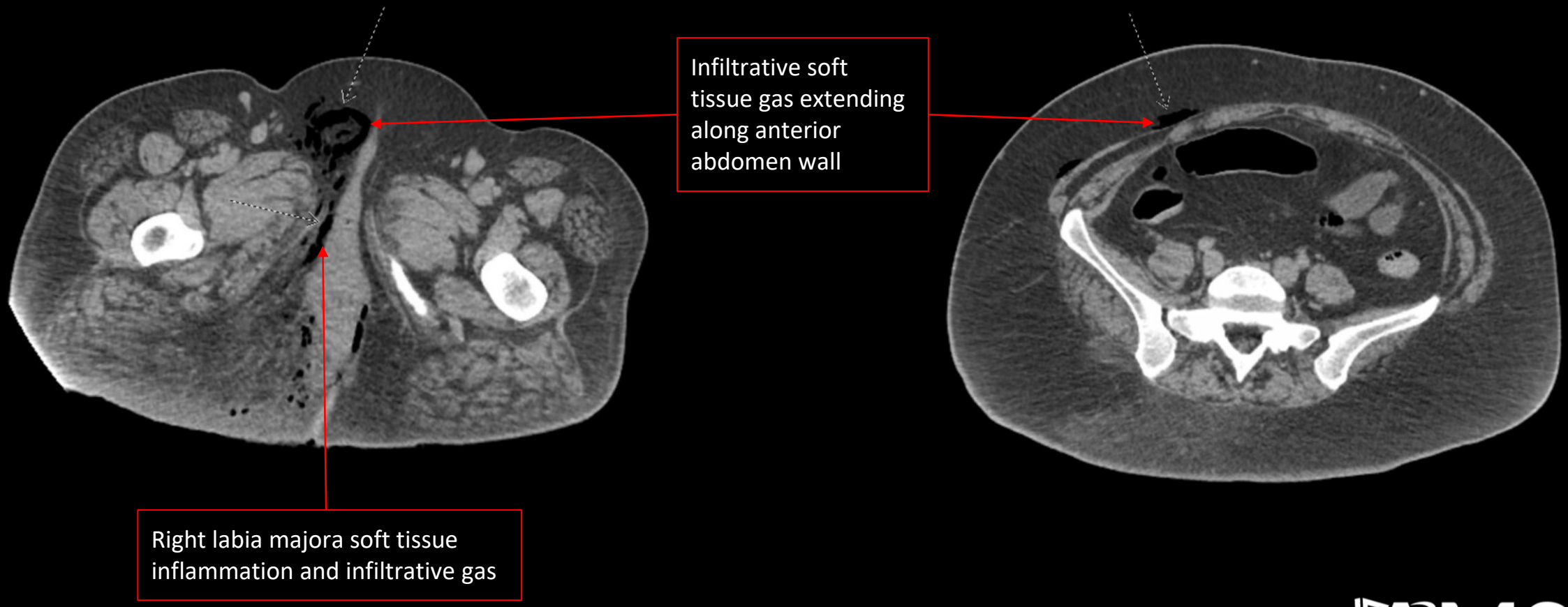
CT Abdomen/Pelvis - venous phase, axial



Emergent Surgical Findings

"Dark purulent drainage was present. This was malodorous and a sample was sent to microbiology for culture. Necrotic skin, soft tissue, and muscle were present consistent with Fournier gangrene."

Culture and Gram stain results:

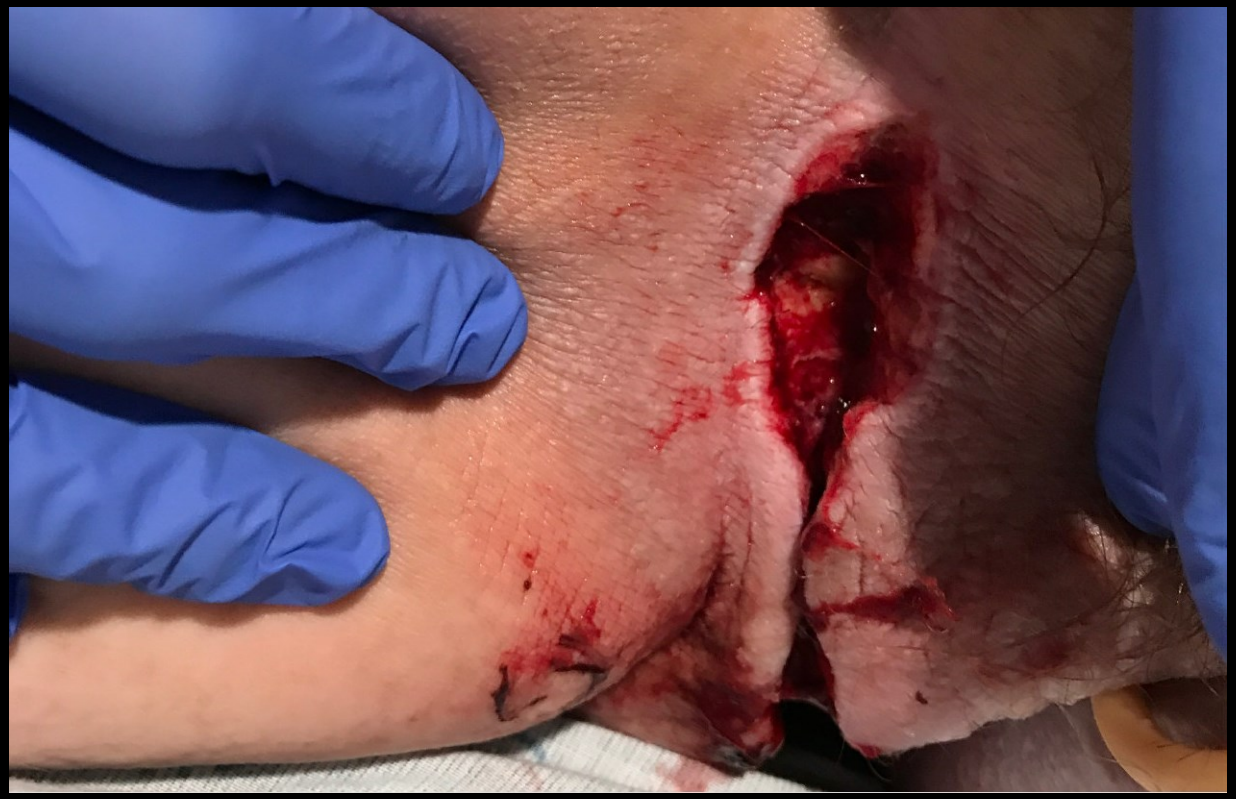
- 2+ Clostridium innocuum
- Anaerobic Gram Negative Rod
- 1+ Streptococcus anginosus
- No fungi
- No acid-fast bacilli

Final Dx:

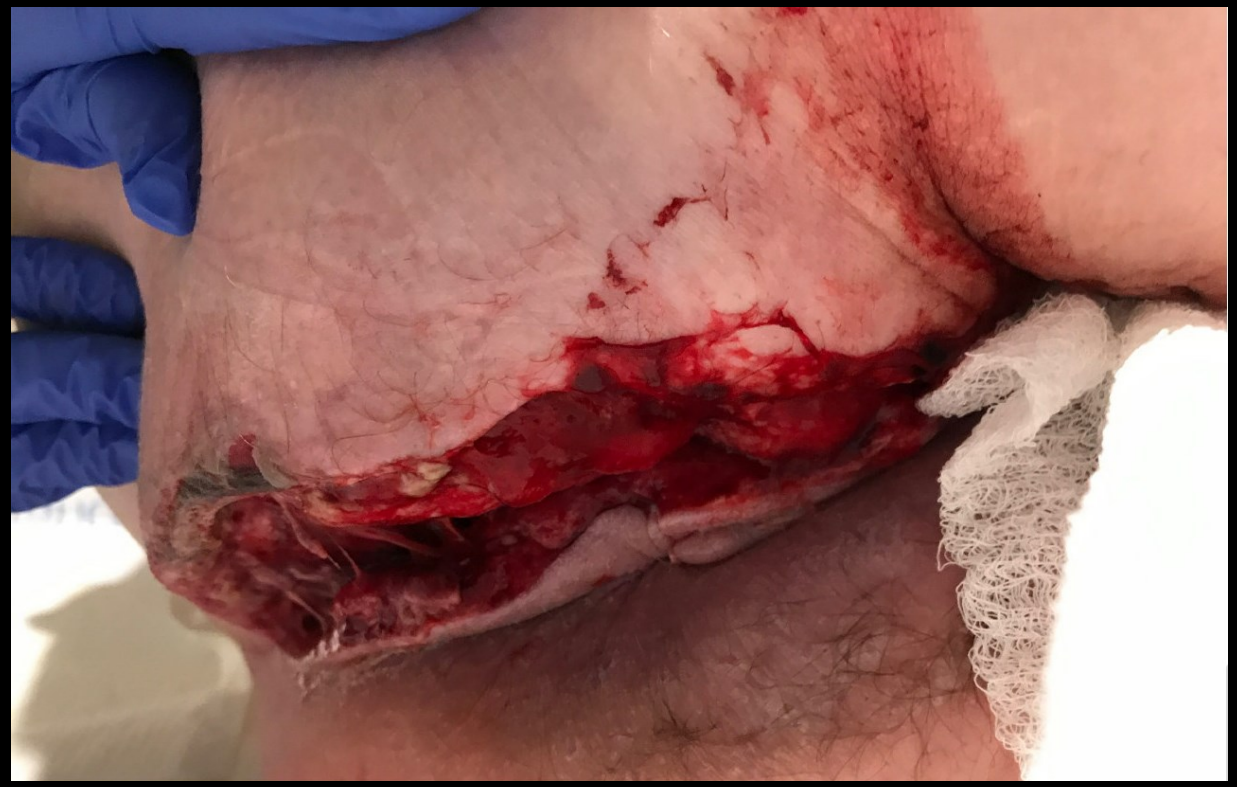
Polymicrobial (type I) necrotizing fasciitis of the perineum

"Fournier gangrene"

HD9, s/p debridement



Right groin and perineum debridement



Right buttock debridement

Fournier Gangrene

Pathophysiology:

1. Localized cellulitis causes an obliterative endarteritis, leading to (sub)cutaneous vascular necrosis
2. Ischemia and rapid bacterial (aerobic + anaerobic) proliferation ensue
3. Necrotizing infection spreads through the fascial planes: perianal and perineal regions → thighs and anterior abdominal wall
4. Methane and CO2 produced by bacteria results in subcutaneous emphysema

Etiology:

- **Anorectal infection -** abscess, anal fistula, colonic perforation
- **Urogenital tract infection -** bulbourethral gland infection, epididymitis, orchitis, urethral injury, lower UTI
- **Skin infection of genitalia -** hidradenitis suppurativa, decubitus ulcer, trauma

Fournier Gangrene

Epidemiology: Annual incidence 1.5 per 100,000 worldwide, 10:1 M:F

Risk Factors: DM, Vascular disease, Obesity, Immunosuppression, Alcoholism, SGLT2 inhibitor use, IBD, Malignancy

Clinical Presentation:

- Poorly demarcated erythema (72%)
- Diffuse edema (75%)
- Extreme tenderness (72%)
- Fever (60%)
- Crepitus (50%)
- Skin bullae, necrosis, or ecchymosis (38%)

Differential Diagnosis: Severe soft tissue infection without necrosis
Gas gangrene

Fournier Gangrene

Imaging:

- Preferred: **CT w/ contrast** - Soft tissue and fascial thickening, Fat stranding, Soft tissue gas
- If inconclusive clinical findings: XR - Soft tissue gas
  - *Absence of gas DOES NOT exclude diagnosis*
- US - Soft tissue fluid and/or gas
  - *Limitation = requires direct pressure to be applied to extremely tender area of concern*

Management: Admit all patients with suspected or confirmed necrotizing soft tissue infection

- Immediate surgical exploration with debridement
- IV broad-spectrum antibiotics
- Aggressive supportive care for sepsis (if present)

References:

ACR Appropriateness Criteria https://acsearch.acr.org/list

Bruun T, Rath E, Madsen MB, et al. Risk Factors and Predictors of Mortality in Streptococcal Necrotizing Soft-tissue Infections: A Multicenter Prospective Study. *Clin Infect Dis*. 2021;72(2):293-300. doi:10.1093/cid/ciaa027

Hua C, Urbina T, Bosc R, et al. Necrotising soft-tissue infections. *Lancet Infect Dis*. 2023;23(3):e81-e94. doi:10.1016/S1473-3099(22)00583-7

Sartelli M, Guirao X, Hardcastle TC, et al. 2018 WSES/SIS-E consensus conference: recommendations for the management of skin and soft-tissue infections. World J Emerg Surg. 2018;13:58. Published 2018 Dec 14. doi:10.1186/s13017-018-0219-9

Stevens DL, Bryant AE. Necrotizing Soft-Tissue Infections. *N Engl J Med*. 2017;377(23):2253-2265. doi:10.1056/NEJMra1600673

Zacharias N, Velmahos GC, Salama A, et al. Diagnosis of necrotizing soft tissue infections by computed tomography. *Arch Surg*. 2010;145(5):452-455. doi:10.1001/archsurg.2010.50

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