AMSER Case of the Month: March 2019

73 YO male presenting with left hip pain

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Patient Presentation

• **HPI:** 73 year old male presented with left hip pain status post fall 7 days prior, with acute worsening of mental status prompting presentation to ED

• **PMH:** Type II diabetes mellitus, COPD, hypertension

• **PSH:** s/p total arthroplasty of left hip, date unknown

• Physical exam identified crepitus and skin necrosis over left hip
Pertinent Labs

• Lactic acid 4.3
• Na 125
• HCO3 13
• BUN 74
• Creatinine 3.36
• WBC 21 (23% bands)
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

<table>
<thead>
<tr>
<th>Radiologic Procedure</th>
<th>Rating</th>
<th>Comments</th>
<th>RRL*</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-ray area of interest</td>
<td>9</td>
<td>This procedure may be appropriate but there was disagreement among panel members on the appropriateness rating as defined by the panel’s median rating. X-ray is the preferred initial study. Contrast is preferred for evaluation of possible concomitant soft-tissue abscess.</td>
<td>Varies</td>
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<tr>
<td>CT area of interest with IV contrast</td>
<td>5</td>
<td>Varies</td>
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<tr>
<td>CT area of interest without IV contrast</td>
<td>5</td>
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<td>CT area of interest and with IV contrast</td>
<td>1</td>
<td>Varies</td>
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<td>MRI area of interest without IV contrast</td>
<td>1</td>
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<td>MRI area of interest with and with IV contrast</td>
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<td>US area of interest</td>
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<td>0</td>
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</tbody>
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**Rating Scale:** 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

*Relative Radiation Level*
Findings: (unlabeled)
Findings: (labeled)

- Total hip arthroplasty hardware intact, no evidence of fracture or dislocation

- Large quantity of gas within the soft tissues of the left hip, possibly due to gas-forming infection or penetrating injury
### Initial radiographs showing soft-tissue gas in absence of puncture wound.

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*Relative Radiation Level*
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Extensive subcutaneous air in the soft tissues in both gluteal muscles and in the subcutaneous fat of the left buttock extending into left upper thigh.
Findings: (labeled)

Free air in the subcutaneous tissues and in gluteus maximus muscles

Free air in the subcutaneous tissues and in the posterior compartment extending down to the level of the knee
Final Dx:

Septic shock secondary to necrotizing fasciitis

- Multiple surgical debridements and broad spectrum antibiotic coverage were ultimately unsuccessful, with continued spread of infection
  - Spread as far down as mid-calf, up to mid-back and around left lateral abdominal wall at time of final surgery
- Two days after presentation, patient passed away
Case Discussion

• Necrotizing fasciitis
  • Infection of deep soft tissues with destruction of muscle fascia and subcutaneous fat
  • Rapidly progressing, high mortality
  • caused by various species of Gram-positive cocci (Staphylococcus aureus, Streptococcus pyogenes, and enterococci), Gram-negative rods (Escherichia coli, Pseudomonas aeruginosa), and anaerobes (Bacteroides and Clostridium species)

• Risk factors
  • Penetrating trauma or skin breach
  • Blunt trauma (ex: fall, as was the case in this patient)
  • Immunosuppression, including diabetes (another risk factor in this patient)

• Clinical and laboratory findings
  • Erythema, edema, pain out of proportion, fever, crepitus, skin necrosis
  • Leukocytosis, acidosis, hyponatremia, elevated lactate, elevated creatinine
Case Discussion

• Treatment of necrotizing fasciitis requires early recognition and surgical intervention for debridement of necrotic tissue, along with coverage with broad-spectrum antibiotics.

• Initial imaging modality if presence of soft tissue gas is suspected: x-ray area of interest.

• Radiographic imaging should NOT delay surgical exploration when crepitus is present or patient’s clinical status is rapidly deteriorating.

• CT is more useful than MRI for detection of gas in soft tissues, and is the preferred imaging modality after initial radiograph demonstrates possible air in soft tissue.
References: