

When Necrotizing Fasciitis is “heartier” than deep tissue

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Introduction

- Necrotizing soft tissue infections (NSTIs), also known as flesh eating bacteria, is a fulminant tissue destruction, with systemic signs of toxicity, and high mortality.¹
- NSTIs include necrotizing forms of fasciitis, myositis, and cellulitis. Bacteria is generally introduced through a break in skin integrity.
- Infection typically spreads along the muscle fascia due to its relatively poor blood supply.²
- Although infection can monomicrobial or polymicrobial, infection that include Clostridium species or Gram-negative rods (Enterobacteriaceae or facultative anaerobes streptococcus) will lead to the recognizable gas formation in deep tissue.³
- Early identification, surgical debridement and broad-spectrum antibiotics are the key components of care.

Identification and Recommended Treatment

- Affects 0.4 in 100,000 people per year in the U.S.
- Associated mortality of 30-90%
- Cardinal Characteristic/symptoms:2
 - Erythema without sharp margins
 - Edema extending beyond the visible erythema
 - Out of proportion severe pain
 - Fever and tachycardia if systemic
 - Crepitus
 - Skin bullae, necrosis, ecchymosis
- Suggested treatment plan includes:
 - Early diagnosis of necrotizing infection
 - Early initiation of appropriate antibiotics
 - Carbapenem or Piperacillin/tazobactam PLUS agent for MRSA coverage (Vancomycin/Linezolid/Daptomycin) PLUS Clindamycin
 - Emergent surgical debridement
 - Hemodynamic support

Case Presentation

- 63-year-old male with PMHx of NASH cirrhosis and Diabetes Mellitus type 2 who presented with severe left leg pain and edema.
- A left lower extremity ultrasound was obtained to rule out a deep vein thrombosis but revealed air of unknown etiology.
- The patient’s pain increased, and his clinic condition deteriorated to septic shock.
- He underwent CT scan of left lower extremity which was significant for extensive necrotizing fasciitis with extensive air in the soft tissues that extended to crural fascia and venous structures (Figure 1).
- CT Chest revealed significant pneumocardia (large amount of air within the right heart) (Figure 2), hepatic venous system, IVC and left iliac vein related to embolization of gas formed by lower extremity necrotizing fasciitis. He underwent emergent left AKA for source control.
- Repeat imaging over several days showed resolution of the air within the venous system (It may be worth to put a side by side image before-after for demonstration of resolution) Figure 3.
- Cultures were positive for E. Coli and he completed a duration of Cefazolin. He required multiple OR debridement of the left stump.
- Ultimately, after a prolong hospital stay, he was discharged to a skilled nursing rehab facility with limited functional limited except for amputation.



Figure 1



Figure 2

Figure 1: Left tib/fib x-ray with extensive subcutaneous air from necrotizing fasciitis.

Figure 2: CT abdomen with gas/air within the right heart from necrotizing fasciitis. This could be tracked through the venous system, extending to the portal system.

Discussion

- Early recognition of NSTI is imperative. Delay in surgical intervention can increase the mortality rate in patients.
- Pneumocardia has been reported after open heart surgery, air embolism related to vascular procedure or embolization from liver abscess.⁵
- Hepatic vein gas has been reported as an indicator of serious acute disease (abdominal infection/abscess, or trauma) or after therapeutic interventions (such as surgery; hepatic artery embolization for a tumor or for active bleeding; percutaneous tumor ablation with radiofrequency, cryotherapy, laser photocoagulation, or ethanol).⁶
- However to our knowledge and after an extensive literature research this is the first case reported of both cardiac and hepatic air embolization after a lower extremity NSTI.
- Emergent source control was the corner stone on this patient treatment that lead to recovery. There was no need of hyperbaric oxygen chamber but it was considered.

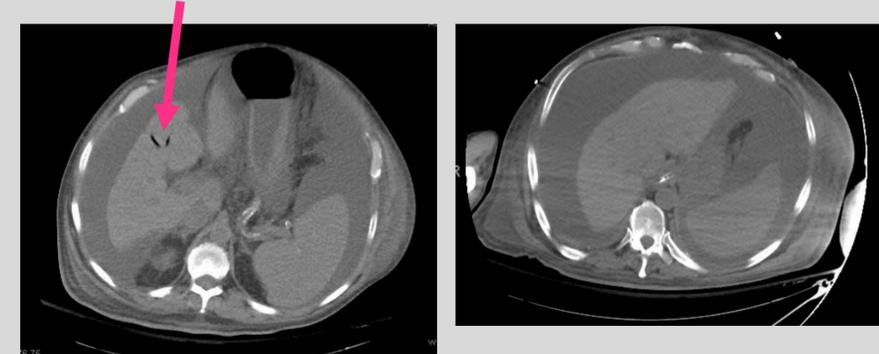


Figure 3: Side by side images of the portal vein gas including resolution.

References

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