

EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

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Necrotizing Fasciitis

A 38-year-old male with a past medical history of type 2 diabetes and hypertension presents to the ED with left leg pain onset 5 days ago that is worsening. He reports that his pain worsens with movement. He states that he is from Haiti and was told to come to a hospital in America to seek treatment. He denies fever, chest pain, abdominal pain, or any other symptoms. Patient has a low-grade fever and his vitals show he is hypertensive, but no other abnormalities. On physical exam, patient has a large area of erythema, swelling, and edema over his left leg. The edema extends towards his left foot. This area is extremely tender to palpation. There is no crepitus. His distal pulses are intact and the rest of the exam is within normal limits. Which of the following is the most appropriate initial treatment for this patient's condition?

- A. Metronidazole
- B. Surgical debridement
- C. Piperacillin-Tazobactam, Vancomycin, and Clindamycin PLUS surgical debridement
- D. Piperacillin-Tazobactam, Vancomycin, and Clindamycin ONLY
- E. Ceftriaxone



Figure 1: Patient's right leg

Necrotizing soft tissue infections can include necrotizing fasciitis, myositis, and cellulitis. Necrotizing fasciitis is an infection of the deep soft tissues that can progress into the destruction of the muscle fascia and subcutaneous fat.

Typical findings include:

- Erythema without sharp margins
- Edema that extends beyond visible erythema
- Severe pain
- Fever
- Crepitus
- Skin bullae, necrosis, or ecchymosis

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

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The correct answer is C. Both surgical debridement and antibiotic therapy is necessary for necrotizing fasciitis. The antibiotics chosen should be broad-spectrum and should be active against gram-negative, gram-positive, and anaerobic organisms.

Necrotizing soft tissue infections should be suspected in patients with a soft tissue infection, signs of systemic illness like fever or hemodynamic instability, crepitus, and severe pain out of proportion to skin findings. Lab findings are generally nonspecific. CT scans are the best initial imaging and the most useful finding is the presence of gas in the soft tissues. Frequently, nonspecific findings are shown on CT, like soft tissue swelling.

Discussion

Necrotizing fasciitis is characterized by fulminant tissue destruction and systemic signs of infection. There are classified into two categories. Polymicrobial (type I) and monomicrobial (type II). In polymicrobial infections, at least one anaerobic species (*Bacteroides*, *Clostridium*, or *Peptostreptococcus*) is isolated with one or more facultative anaerobe. Monomicrobial infections are usually caused by GAS or other beta-hemolytic streptococci.

Risk factors for this infection includes major penetrating trauma, minor laceration, recent surgery, skin or mucosal breach, immunosuppression, malignancy, obesity, alcoholism, and pregnancy. Diabetes is a common risk factor for infections involving the lower extremities, perineum, and head and neck area.

Surgical exploration is the only way to establish the diagnosis of necrotizing infection by direct visualization of swollen and dull-gray fascia, thin exudate without clear purulence, and easy separation of tissue planes by blunt dissection.

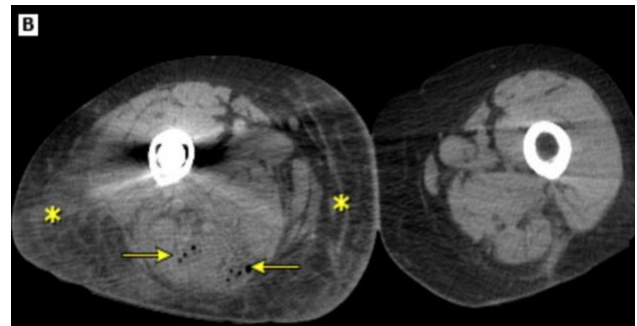


Figure 2: CT scan showing gas bubbles (arrows) and circumferential edema (asterisks).

Treatment

Patient's with necrotizing fasciitis still have high mortality rates, even with optimal therapy. The main goal is to start antibiotic therapy early and have the patient undergo aggressive surgical exploration and debridement. In patients that were given antibiotic therapy and no surgical debridement, the mortality rate approached 100%.

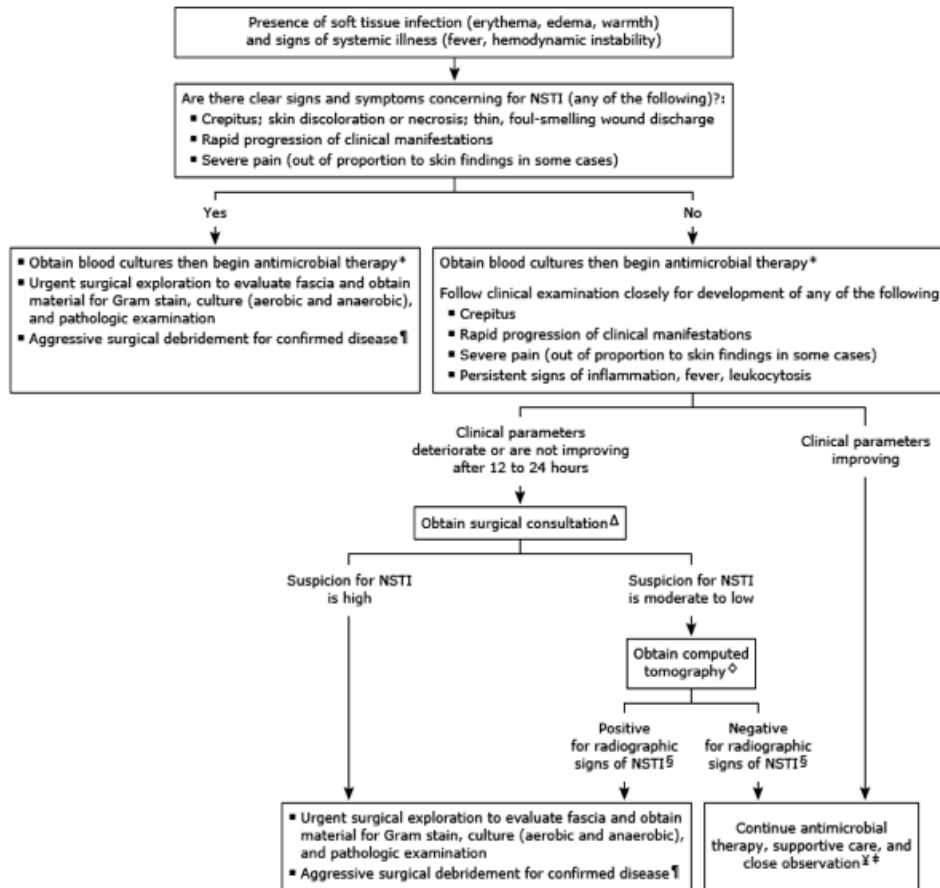
Necrotizing fasciitis is considered a surgical emergency and should not be delayed, especially when there is crepitus on examination. The goal of surgery is to debride all the necrotic tissue until healthy and viable tissue is reached. Debridement should be continued until necrotic tissue is no longer present. Amputation may be considered if the infection is too extensive.

Antibiotic therapy is also very important and should be started after blood cultures are collected. The antibiotics should be broad-spectrum and should include activity against gram-positive, gram-negative, and anaerobic organisms. Recommendations include a Carbapenem or Piperacillin-tazobactam, Vancomycin, and Clindamycin. These should be tailored to the culture results once available and antibiotics should be continued until no further debridement is necessary and the patient is hemodynamically stable.

For a list of educational lectures, grand rounds, workshops, and didactics please visit BrowardER.com and click on the "Conference" link.

All are welcome to attend!

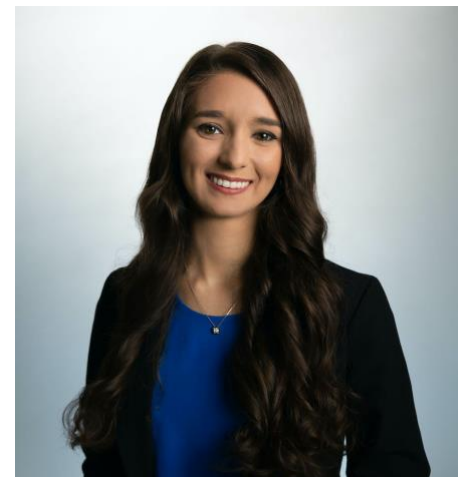
Approach to evaluation and initial management of possible necrotizing soft tissue infection



The prognosis of necrotizing fasciitis depends on many factors. Polymicrobial infections have a mortality rate of 21%, with Fournier gangrene having a 22-40% mortality rate. Monomicrobial infections have a 14-34% mortality rate. Other factors that increase mortality include: WBC > 30,000/microL, serum creatinine >2.0mg/dL, age >60 years, streptococcal toxic shock syndrome, Clostridial infection, delay in surgery for more than 24 hours, and infection involving the head, neck, thorax, or abdomen.

Take Home Points

- Necrotizing fasciitis is a rapidly progressive deep soft tissue infection and should be suspected when patients have a soft tissue infection and severe pain, edema, erythema, crepitus, bullae, and other signs of systemic toxicity.
- CT findings may help with diagnosis, but surgical exploration and direct visualization of tissues is the only way to establish the diagnosis.
- Treatment involves prompt broad spectrum antibiotic therapy and surgical debridement of tissues.



ABOUT THE AUTHOR

This month's case was written by Crystal Acosta. Crystal is a 4th year medical student from NSU-COM. She did her emergency medicine rotation at BHM in January 2021. Crystal plans on pursuing a career in Internal Medicine after graduation.

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