



Dissection and Diagnosis: The Challenge of Rapidly Progressive Necrotizing Fasciitis in the Right Lower Leg: Case Report

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Abstract: Necrotizing fasciitis is a rapidly progressive and life-threatening soft tissue infection with significant risks of major amputation and mortality rates ranging from 20% to 80%. This disease affects approximately 0.4 out of every 100,000 individuals. Timely surgical resection of necrotic tissue is critical in determining patient prognosis. The patient's chief complaints often mimic less severe skin infections, such as erysipelas and cellulitis, posing challenges for rapid surgical management. Definitive diagnosis typically necessitates surgical exploration and debridement, with delays in recognition or intervention associated with severe outcomes, including sepsis, amputation, and multiple organ failure. Point-of-care ultrasound has emerged as a valuable diagnostic tool, capable of early detection of hallmark features such as subcutaneous thickening, gas, and perifascial fluid collections. Complementary radiologic modalities, including plain radiographs, computed tomography (CT), and magnetic resonance imaging (MRI), along with Laboratory investigations, physical examination and wound measurement can further substantiate the diagnosis of necrotizing fasciitis. Immediate management should encompass surgical debridement, broad-spectrum intravenous antibiotics, aggressive fluid and electrolyte resuscitation, and effective pain control. Adjunctive therapies, such as intravenous Fevastin, Tramadol, Metronidazole, Piperacillin, and intravenous immunoglobulins, may provide additional benefits in the comprehensive treatment of this severe condition.

Keywords:

Fasciitis, Ultrasound, Cellulites, Debridement, Ulcers, Erysipelas

I. INTRODUCTION

A rare but very dangerous bacterial illness that attacks the right lower limb's soft tissue, specifically the fascia, is called necrotising fasciitis [1]. This illness can have serious repercussions and is rapidly progressing, making it a serious medical emergency.

Necrotising fasciitis is usually occurred to this patient by germs like Group A Streptococcus, which enter the body through wounds or surgical incisions. Toxins released by these bacteria swiftly permeate the fascial planes, destroying tissue and impairing blood flow to the afflicted location. [2].

Necrotizing fasciitis in the right lower limb is characterized by swelling, redness, warmth, and excruciating pain that is out of proportion to the visual symptoms. The skin may get blisters or patches of necrosis (dead tissue) as the illness worsens. As the infection spreads throughout the body, systemic symptoms like fever, chills, nausea, and confusion may also appeared.

Appropriate diagnosis is essential to successful treatment. Typically, intravenous antibiotics are used to treat the bacterial infection and emergency surgery is performed to remove dead and infected tissue (debridement) [2]. Stabilizing the patient's condition also requires supportive care, which includes monitoring for organ dysfunction and performing fluid resuscitation.

Necrotizing fasciitis is an aggressive condition; therefore, prompt medical attention is essential to avoid life-threatening consequences such as sepsis, amputation of limbs, or even death [2]. Improving prognoses for patient suffering with this serious illness in the right lower limb depends critically on being aware of the symptoms and seeking medical assistance as soon as possible [3]

Case Presentation:

A 47-year-old women was admitted in the General surgery due to a prelipothymic event at home, associated with worsening pain in the left lower limb started about 48 h earlier and spread to the thigh since 5 hrs. The patient has a history of fallen stairs

causing laceration three months back for which suturing was done and she developed cellulites and non-healing ulcers since two months and she has previous history of knee pain since 10 years taking NSAIDs like Ibuprofen (400mg) and swelling at the infected region, at the site of intramuscular injection of muscle relaxants and NSAIDs at home 2 days before and treated with local disinfection and antibiotic therapy with oral amoxicillin.

Patient had history of hypertension taking Amlodipine 5mg once daily after breakfast. No diabetes and no immunosuppression or alcohol abuse but patient has a history of smoking chutta (a type of hand roller cigar commonly used in some regions) tobacco wrapped in a tendu leaf.

Upon arrival, the patient was asthenic, lucid and cooperative, febrile (Temp 38 °C), hypertension with Blood pressure (BP) 140/90 mmHg; HR 120 bpm; Atrial oxygen saturation (SaO₂) 91%.

The patient's increased White blood cell (WBC) count of 14,250 cells/cu.mm (Table 1), which denotes a severe infection that quickly destroys the skin and the tissue covering the muscles (fascia), was observed by the doctor during the laboratory study. The patient's elevated sodium levels (149 mEq/L) suggest a fluid and electrolyte imbalance, which is commonly associated to dehydration and necessitates restoring fluid balance and electrolyte balance. The elevated WBC count represents the body's immune response to combat this aggressive infection.

A patient's elevated liver enzyme (alkaline phosphate, 115 IU/L) may indicate liver dysfunction, which could be brought on by a systemic illness Table (2).

As a preliminary step, an ultrasound scan was conducted. The results revealed images of gas bubbles on the supra and infrascial layer, which may indicate fasciitis. Following the patient's clinical stabilization, a CT scan was carried out. This test produced an intricate depiction of the body's internal architecture, validating the results of an ultrasound (US).

This scan also shows widespread inflammation of the subcutaneous fat layer beneath the skin. It is frequently accompanied by painful nodules linked to emphysema that affect the piriformis muscle in the lower knee, which extends from the dorsum of the right foot to a point 10 cm below the right knee. The edges of the nodules are unknown.

The patient's clinical status was normal (Blood Pressure 130/80 mmHg) within 6 hours of the OR preparation, despite the infection site edema. Parenteral Piperacillin and Meropenem and the patient pre-operative orders are as follows inj Tetanus toxoid 1/2cc IM stat, NBM +IVF 80ml/hr, Inj Metrogyl 500mg IV stat, Inj Pantop 40mg IV stat, Inj Fevastin 3amp in 100ml NS IV BD were administered as part of a broad range antibiotic regimen, and the patient required immediate: Debridement surgery. The outcome of surgery is success to the patient and followed by post-operative medications like Clindamycin, Piperacillin, and Pantop. Before discharging the patient from the hospital clinician suggested her to take high protein diet to support healing and physical therapy to regain strength and mobility and advised to patient to come for regular check-ups.

Table1: Laboratory investigation during administration:

Parameters	Observed Value	Normal Range
Complete Blood Picture		
RBC Count	3.68 million/cu.mm	3.8-4.8 million/cu.mm
Packed Cell Volume (%)	30.4%	36-46%
MCV	78.3fL	80-100 fL
MCHC	34.2g/dL	31.5-34.5g/dl
Hemoglobin	9.3g/dL	12.0-15.0 g/dL
WBC Count	14.250cells/cu. mm	4000-11000cells/cu.mm

Table 2: Laboratory Values:

Parameters	Observed value	Normal Range
Serum Electrolyte Level		
Potassium	4.3mEq/L	3.5-5.5
Sodium	149mEq/L	135-155
Liver Function Test		
SGOT	16 IU/L	5-34
SGPT	35 IU/L	Upto34
Alkaline Phosphate	115 IU/L	43-128

Discussion:

Necrotizing fasciitis is a prevalent soft tissue infection that affects approximately 0.4 out of every 100,000 individuals annually in the United States [4]. It carries a significant risk of major amputation and a fatality rate ranging from 20 to 30% [5]. It is prevalent as one in per 100,000 people in certain parts of the world [6]. Immediate surgical removal of necrotic tissue is crucial in establishing the outcome. An ideal time frame of six hours from presentation to surgery was determined by Nawijn et al. [7]. Necrotizing fasciitis mimics the symptoms of common skin infection such as cellulitis and erysipelas, making prompt surgical management challenging. Point-of-care ultrasound is useful tool in this situation for early diagnosis, identifying the presence of subcutaneous thickening [8-9]. Other characteristic ultrasound findings include the appearance of the subcutaneous soft tissues [10].

Conclusion:

The use of ultrasound technology improved patient outcomes by enabling early differential diagnosis and the best possible "timing" of operations. A more precise surgical planning was made possible by the later acquisition of second level imaging (CT scan). In non-gold standard cases such as this one, a laboratory investigation and physical examination allow for an optimal and comprehensive patient treatment, guiding the clinician toward a therapeutic and diagnostic pathway that promotes full recovery of the patient.

Acknowledgment: Acknowledgment:

I would like to express my deepest gratitude to all those who contributed to the care and recovery of our patient with necrotizing fasciitis. I would also like to acknowledge all the researchers and scholars for providing the valuable information regarding Necrotizing fasciitis. Finally, a personal thanks to Dr. Aleena Roy Pharm D, for her constant encouragement to prepare this report.

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