

**NECROTIZING FASCIITIS OF LIMB: A CASE REPORT**

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**ABSTRACT:** Necrotizing fasciitis is a severe, rare, potentially lethal, soft tissue infection that tends to develop in scrotum, perineum, abdominal wall or the extremities. It is a medical emergency that threatens both patient's limb and life. Necrotizing fasciitis has the potential to become quite severe - in such cases a radical debridement amounting to amputation of the limb may be required to save the patient's life. Early diagnosis requires a high index of suspicion. We describe a case of a 49-year-old obese woman who developed necrotizing fasciitis in her left lower limb for which she underwent multiple radical surgical debridement, followed by skin grafting for reconstruction of the limb defects. Our main focus was to salvage the limb with the help of antibiotics and multiple debridements. This report emphasizes the need to have a relook at the use of Parenteral Crystalline Penicillin and diligent management of wounds resulting from repeated debridements.

**KEYWORDS:** Fasciitis, Necrotizing, debridement, penicillin.

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**INTRODUCTION:** Necrotizing fasciitis is a severe, rare, potentially lethal, soft tissue bacterial infection that tends to develop in scrotum, perineum, abdominal wall or the extremities, which threatens both limb and life. An early diagnosis with a high index of suspicion is thus mandatory. A timely diagnosis along with prompt, multiple surgical debridements is key to a favourable prognosis. In this case, despite the patient lapsing into septic shock, a combination of repeated surgical debridements along with intravenous benzyl penicillin therapy led to a favourable outcome.

**CASE REPORT:** A 49 years old woman presented to emergency department with swelling of left lower limb of 5 days duration which was associated with moderate pain over the entire leg along with continuous low grade fever. She gave a history of similar complain - associated with pain 7 years back, which was managed conservatively. It left her with a diffusely swollen left lower limb.

On general examination, she was obese with BMI of 34.7 kg/m<sup>2</sup>. Her pulse rate was 98 beats per minute and temperature 98.6F. Her entire left lower limb was warm, red and tender, although diffuse, non-pitting edema was present only up to the knee. Multiple pustules were also present over the antero-medial aspect of her left leg. [Fig. 1].

A clinical diagnosis of cellulitis was made for which she was placed on Inj. Crystalline Penicillin – 20 Lac IV (6

hourly), Inj. Amikacin 500 mg IV (12 hourly) and Inj. Metronidazole 500mg IV (8 hourly).

The next morning, patient developed hypotension. She was resuscitated with IV fluids and inotropes. Towards the evening, multiple bullae appeared over the antero-medial aspect of her left limb. In view of this clinical picture diagnosis was modified to necrotizing fasciitis. Biochemical and hematological investigations were repeated, indicating a rise in her serum creatinine levels (>1.1 mg/dl), blood urea levels (68mg/dl) and total Leukocyte count (11,200/cu mm).

The patient was taken up for urgent fasciotomy & debridement of the left lower limb the following afternoon [Fig. 2]. She needed five more debridements over the next 3 months. All the cultures of the debrided tissue yielded polymicrobial growth. Predominant organisms isolated were Staphylococcus, Streptococcus, E.coli & Pseudomonas with sensitivity to Ceftazidime and Tazobactam. Antibiotics were changed accordingly. These debridements left the patient with five ulcers, one each on anterior and anterolateral aspect of leg, one over the dorsum of foot and two at the posterior aspect of leg [Fig. 3]. All of them required skin grafting which was rejected first time. Second, skin grafting after a gap of two weeks was successful for three ulcers, and the remaining two healed by secondary intention [Fig. 4].

**DISCUSSION:** Necrotizing fasciitis has been defined as a progressive potential microbial infection which may involve any layer of the soft tissue (dermis, subcutaneous tissue, superficial fascia, deep fascia & muscle) either singly or in any combination.

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It was first described by Joseph Jones as "Hospital Gangrene" in 1871. Wilson described it as Necrotizing fasciitis in 1952.

Necrotizing fasciitis is further subdivided into necrotizing soft tissue infection (NSTI) & non necrotizing soft tissue infection (NNSTI).

Majority of the patients reported are in the middle age group with males being commonly affected. Certain studies have also reported the maximum incidence of disease between the age group of 42-55 years.<sup>[1]</sup> Our patient was a 49 years old female.

Predisposing factors in our case were advanced age & diabetes mellitus.<sup>[2]</sup> Both these factors are associated with a progressive decrease in immunity, thereby leading to infections within the tissue planes. Diabetic micro angiopathy & neuropathy reduces the vascularity & increases the risk of injuries which acts as a triggering factor. However, no relationship has been found between necrotizing fasciitis & lymphedema. Our patient was a non diabetic with evidence of lymphedema for the past 7 years. It can affect the scrotum, perineum, abdominal wall & extremities, commonest being the lower limb as in our case.<sup>[3]</sup>

Swelling & erythema is the commonest symptom of early necrotizing fasciitis. However, the pathognomic skin changes do not appear for four to five days after the initial presentation of pain, swelling & erythema. As the infection progresses, the skin characteristically becomes more erythematous, painful, swollen with indistinct borders & may even become necrotic with bullae formation. It eventually appears hemorrhagic & erythematous.<sup>[4]</sup>

Early establishment of diagnosis remains as the greatest challenge as late diagnosis may lead to delayed debridement & higher mortality. All efforts must be made in order to differentiate necrotizing fasciitis from cellulitis by repeated physical examination. Hence, the diagnosis of necrotizing fasciitis must be considered with a high index of suspicion in patients who present with unexplained limb pain out of proportion as the presenting signs.

In cellulitis, infection occurs at the junction between the dermis & superficial fascia while in necrotizing fasciitis, it starts at the level of sub cutaneous fat & deep fascia. The epidermal & dermal elements are spared.<sup>[5]</sup> Factors which help to distinguish Necrotizing fasciitis from cellulitis include generalized erythematous rash, toxic appearance, fever & low platelet count.<sup>[6]</sup>

Microbiologically, necrotizing fasciitis has been classified into Type I (poly microbial) & Type II (mono microbial).<sup>[7]</sup> Poly microbial infections are more common which typically occur in the perineum & trunk of immune compromised individuals. It reflects the normal skin commensals present adjacent to the site of infection. Mono microbial infections are less common typically affecting the limbs of healthy patients with no associated co morbidities.

Majority of the infections are poly microbial in nature with the commonest organisms being Staphylococcus & E. Coli.<sup>[8]</sup> Our patient also had a polymicrobial infection and

organisms included Staphylococcus, Streptococcus, E. coli & Pseudomonas.

Penicillin remains the most effective drug against Streptococci & MRSA whereas Cefotaxim & tazobactam showed sensitivity against wide group of organisms. In our case, Inj. Benzyl penicillin was started empirically along with Amikacin & Metronidazole & response was encouraging. This encouraging response to Penicillin can be attributed to diminished use of this antibiotic, thereby increasing its sensitivity to emerging resistant organisms due to the indiscriminate use of other antibiotics. The other antibiotics were changed to Ceftazidime and Tazobactam after culture reports were received. Similar results were obtained in an another study with triple antibiotics.<sup>[3,9]</sup>

Aggressive debridement in multiple sittings was the primary operative procedure in our case which is also recommended in other studies.<sup>[10,11]</sup> The average number of debridements in a study was 2.5 while our patient underwent six multiple debridements.

It took three months of regular copious irrigation with hydrogen peroxide & antiseptic dressing with 1% povidone iodine by the interns & residents which helped in preparing a healthy bed for skin grafting.

**CONCLUSION:** Necrotizing fasciitis is a lethal soft tissue infection commonly affecting the lower limb. Early diagnosis, aggressive & repeated debridement, appropriate antibiotics & adequate wound management remains the mainstay of treatment.

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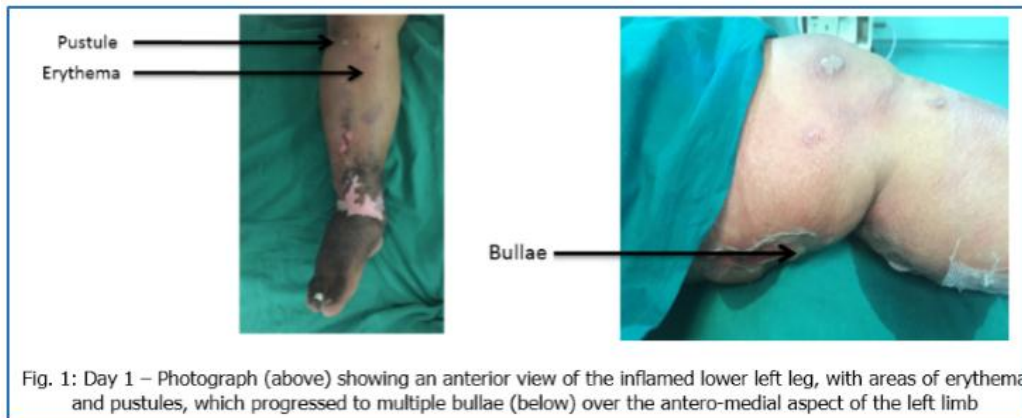




Fig. 4 – Day 94: Photograph showing the insertion of grafts into the limb deficits weeks after the sixth debridement.