

Case Report

Necrotizing fasciitis caused by *Pseudomonas aeruginosa*: a rare case report and recent concepts in diagnosis and management

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ABSTRACT

Necrotizing fasciitis caused by *Pseudomonas aeruginosa* is an extremely rare and life threatening bacterial soft tissue infection. Here we report a case study of fully established necrotizing fasciitis associated with monomicrobial pseudomonas infection in a 34 years old male. The patient presented with painful, necrosed areas of skin and soft tissue over right gluteal region which rapidly progressed to right upper back. Aggressive supportive measures and early debridement lead to a full recovery with no functional deficits.

Keywords: Necrotizing fasciitis, *Pseudomonas aeruginosa*, Aggressive soft tissue infection, Debridement

INTRODUCTION

Necrotizing fasciitis is a rare but severely debilitating soft tissue infection which can rapidly progress to death if not promptly managed. It is characterized by the involvement of subcutaneous tissue and subsequent fascial necrosis.¹ It usually involves the extremities, abdominal wall or the perineum. It has been historically known by various monikers, Meleney's gangrene, Fournier's gangrene (scrotum and perineal area), hospital gangrene, and suppurative fasciitis.¹⁻³

Here we report a case of necrotizing fasciitis caused by pseudomonas aeruginosa in a patient with chronic skin condition and history of intramuscular injection locally.

CASE REPORT

34 years old male patient, a farmer by occupation was admitted with complaints of pain and swelling over right gluteal region with history of maculopapular lesions and

itching all over the body, diagnosed and managed as discoid lupus erythematosus for the last 2 years.



Figure 1: Necrotic patch over the right gluteal region.



Figure 2: Large necrotic region extending to lower back from gluteal region.



Figure 3: Condition of wound after first debridement.



Figure 4: Intraoperative picture during second debridement.

He had a history of intramuscular injection over gluteal region for the same condition from a local doctor following which he developed a patch over the local site which

further deteriorated into an inflammatory condition due to which he was admitted to a local primary hospital. Subsequently the condition of patient worsened and he was referred to our institute.

At presentation, the patient was febrile, agitated and in septic shock. The patient's infection profile was done where counts were found to be extremely high, inflammatory markers were raised and blood pressure was 80/60 mmHg. The patient's condition was stabilized by giving blood transfusion to correct anemia, broad spectrum antibiotics, fluids and albumin infusion and emergent primary debridement was done. All the necrosed tissues were debrided till healthy margin was achieved and the whole thickness of tissue including skin was sent for culture and sensitivity. Intra-operatively typical foul smelling 'dishwater pus' was observed. Deep fascia was found to be necrotic and there was no resistance to blunt finger dissection. Wound was left open and covered with a sterile dressing. A combination of broad-spectrum antibiotics was started as per hospital protocol. It was later on modified after the culture (*Pseudomonas aeruginosa*) and sensitivity reports came. The patient was kept on a high protein diet and regular wound dressing was done. The wound gradually healed but a focus of necrosed tissue reappeared for which we did second debridement on day 11. In a few weeks, there was good coverage of the wound with granulation tissue.



Figure 5: The wound after split thickness skin grafting.



Figure 6: 6 months post-operative photo of the right gluteal region with complete healing of wound.

Wound closure was achieved with split thickness skin graft taken from the contralateral anterolateral aspect of thigh and the whole wound was covered. Rest of the post-operative course was uneventful.

DISCUSSION

Necrotizing fasciitis has been traditionally classified based on the microbiological organism involved. Type I or the polymicrobial type, involves the trunk or perineum commonly and as the name suggests has a synergistic polymicrobial flora. Type II or monomicrobial, usually due to *Streptococcus pyogenes* but can also be due to *Staphylococcus aureus*. Type III is also a monomicrobial infection and occurs due to *Clostridium species* or gram-negative bacteria. Type IV is extremely rare and is the result of fungal infections usually *Candida species* and *Zygomycetes*.⁴⁻⁶

Some of the risk factors associated with necrotizing fasciitis are immunocompromised status, use of NSAIDs, ingestion of seafood, intravenous drug use, obesity, alcoholism, and old age.^{8,10,13,17-19}

Early diagnosis is essential as delay can lead to systemic infection leading to SIRS (systemic inflammatory response syndrome) and ultimately death. Clinically, they present with the classical triad of symptoms comprising of pain, swelling and erythema. Later in the course, bullae, crepitus, skin necrosis, fever and hypotension can be found.²⁰ Laboratory parameters including the LRINEC score can help distinguish necrotizing fasciitis from other less severe soft tissue infections.²¹ In equivocal cases, MRI scan and ultrasonography can also help in diagnosis.^{22,23} Frozen section biopsy and finger test are other tests that can help confirm the diagnosis.¹⁹

Early and aggressive debridement has been shown to be unequivocally associated with reduced morbidity and mortality. Wong et al had shown that a delay in debridement of more than 24 hours leads to increased mortality.²⁴ They have also given a classification system for the involved skin and subcutaneous tissue, dividing skin into zones with zone 1 having non-viable skin at the epicentre, zone 2 is the intermediate region which can be salvaged with early surgical excision of the non-viable tissue and zone 3 is the healthy skin.²⁵ This system can help in decision making during the surgery. Aim of the debridement is to achieve complete surgical excision of the infected tissue including a healthy margin. Tissue must also be obtained to confirm the diagnosis. Negative pressure therapy (V. A. C. dressings; kinetics concepts, Inc., San Antonio, TX) can be used after a clean wound bed has been obtained. Repeat debridement may also be needed especially in immunocompromised patients.

Pseudomonas aeruginosa as a cause of necrotizing fasciitis is extremely rare with very few reported cases in literature.⁷⁻¹⁷ It is usually associated with co-morbidities

like hematological malignancy, diabetes, alcoholism and malnutrition.²⁶

CONCLUSION

The present patient had a history of chronic skin disease and a local intramuscular injection of an NSAID. He had an abrupt clinical deterioration within a period of 2 days and was in septic shock at the time of presentation in our institute. Prompt resuscitative measures, broad-spectrum antibiotics and emergent surgical debridement led to a complete recovery. Skin grafting was required to cover the defect. Signs and symptoms of necrotizing fasciitis can be misleading especially in the initial stages and a high degree of clinical suspicion is required to arrive at the diagnosis. After confirmation of the diagnosis, there should not be any wait in taking the patient to surgery as that can be life-saving.

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