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Necrotizing Fasciitis without Surgeries – Only Lunatics May?

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Abstract Necrotizing fasciitis is a life threatening disease and patients suffering from the disease require urgent surgical debridement and adjunct board spectrum parental antibiotics. However, this axiom might be challenged since we have a case of non-surgically managed necrotizing fasciitis. This is the first survival case that extensive necrotizing fasciitis was managed with a non-operative approach. It is not unrealistic to postulate that there is a certain indolent subtype of soft tissue infection, without multi-organ dysfunctions, can be managed with antibiotics alone if the disease pattern is better understood in the future.

Keywords: *necrotizing fasciitis*

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1. Introduction

Necrotizing fasciitis is a life-threatening disease. It has long been believed that patients suffering from this disease require urgent surgical debridement and parenteral broad-spectrum antibiotics [1]. However, this paradigm might be challenged by a case of nonsurgically managed necrotizing fasciitis.

A 67-year-old Polynesian female presented to the emergency department with recurrent falls and malaise. She was admitted for the treatment of a lower respiratory tract infection (LRTI), as evidenced by a mild left lower lobe opacity on a chest radiograph. Her medical history included poorly controlled, insulin-dependent type 2 diabetes mellitus; hypertension; transient ischemic attacks; and morbid obesity. Clinically, she was tachycardic at 100 bpm, but maintained a systolic blood pressure of 150 mmHg. Her C-reactive protein level was 333 mg/L and her white blood cell count was 22.5×10^9 cells/L with a neutrophil count of 19.42×10^9 cells/L. She had mild renal impairment with an estimated glomerular filtration rate of 58 mL/min/1.73 m^2. Her random blood glucose level was 26 mmol/L. Of note, she had an elevated creatine kinase level of 330 U/L and an elevated lactate dehydrogenase level of 307 U/L. She was also hyponatremic (serum sodium level, 128 mmol/L).

The patient was treated with intravenous benzylpenicillin and oral doxycycline for her LRTI. Despite treatment with antibiotics, she showed no clinical improvement; continual lethargy and increase in levels of inflammatory markers were noted (Figure 1). Her blood and urine cultures were negative. A sputum nucleic acid amplification test revealed adenovirus infection. Treatment for LRTI was continued. On day 6 of her admission, she became clinically septic. She was febrile; her systolic blood pressure dropped to 96 mmHg, and her heart rate was 103 bpm. Repeat physical examination revealed that she had tenderness on palpation of the right iliac fossa. Abdominal computed tomography (CT) was performed to exclude appendicitis; however, extensive subcutaneous free gas was discovered incidentally (Figure 2) and the appendix was not inflamed. A retrospective physical examination revealed that there was extensive subcutaneous emphysema with an open sinus on her superomedial thigh, which was exuding necrotic material. The diagnosis of necrotizing fasciitis was made. The acute surgical team was consulted, who recommended urgent surgical debridement with possible defunctioning stoma formation. However, the patient denied the surgery, with the acknowledgment that her decision might result in death. After consultation with an infectious disease physician, her antibiotic regime was changed to lincomycin and meropenem. The patient's clinical improvement, as well as the normalization of inflammatory marker levels, was remarkable. After 24 days of hospitalization, she was discharged home on oral amoxicillin and clavulanate potassium therapy. The patient was followed-up in an infectious disease outpatient clinic after 1 week. On day 34, she remained well and her wound was well-granulating.

2. Discussion

There have been extensive discussions in literatures of the classifications [1,2], risk factors [3], and clinical predictors [4,5] of necrotizing fasciitis. The literature has consistently stated that necrotizing fasciitis is a surgically managed disease. In their article, "Necrotizing Soft-Tissue Infection: Diagnosis and Management," Anaya and Dellinger [6] stated, "History has shown that when

treatment is only based on antimicrobial therapy and support, mortality approaches 100%." Indeed, the treatment of necrotizing fasciitis, which has hardly changed for decades, involves intravenous fluid resuscitation, urgent surgical debridement of devitalized tissue, and repeated intraoperative reassessments. A broad-spectrum parenteral antibiotic is also required, but is no replacement for surgical intervention [7,8]. Recent review articles from Goh [9] and Khamnuan [4] report the outcomes of almost 3000 patients with necrotizing fasciitis, and the authors reached the same conclusions about the aforementioned treatments. Other authors quantified the beneficial effects of early and complete debridement. They reported an increase in morbidity and mortality when surgery was delayed for more than 6–12 hours [1,10,11]. Kalaivani, Bharati, and Indumathi also found a statistically significant correlation between early debridement, which was defined as within 24 hours of admission and survival [12]. However, the authors did not include their statistical calculations in this article. The above studies are all observational, and it is highly unlikely that a future trial to assess the benefit of early surgical intervention could be ethically constructed. It is widely accepted that an urgent surgical debridement is the cornerstone of treatment for necrotizing fasciitis. Furthermore, many, if not all, believe that it is essential to favorable outcomes [13]. Herein, we presented a case of a patient with extensive necrotizing fasciitis who was managed non-operatively, with empiric antibiotics alone. Her dramatic and sustained response to therapy ruled out other non-infectious differential diagnoses, despite negative blood and wound cultures. Note that up to 18% of necrotizing fasciitis cases have no organism isolated [14]. In retrospect, our patient's Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score was eight. Van Stigt suggest that an LRINEC score greater than six has a positive predictive value of 92% [15]. This further supports our patient's diagnosis of necrotizing fasciitis.

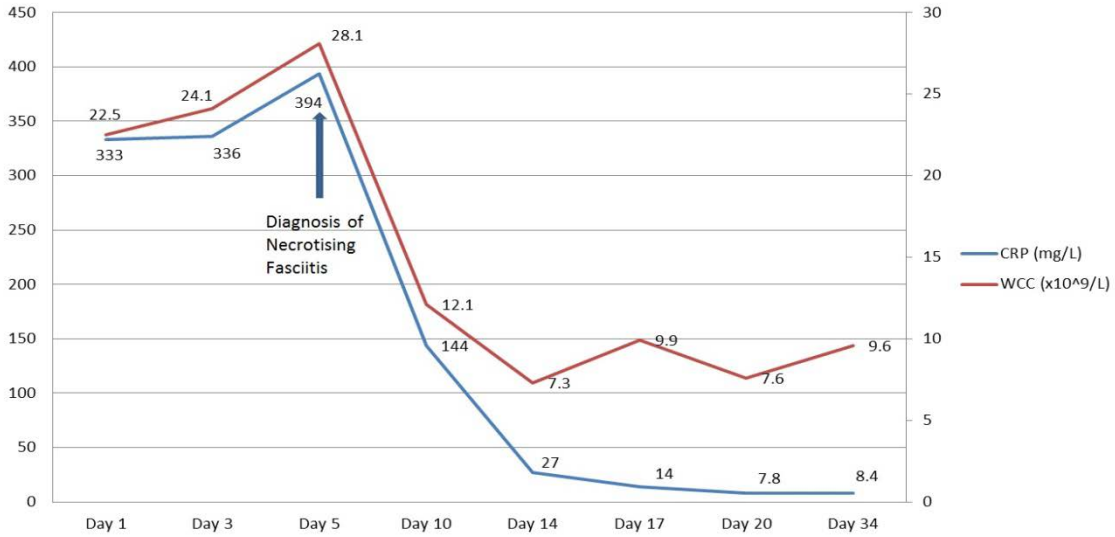

Figure 1. Serum C-reactive protein (CRP) level and white cell count (WCC) improved markedly after treatments during the admission

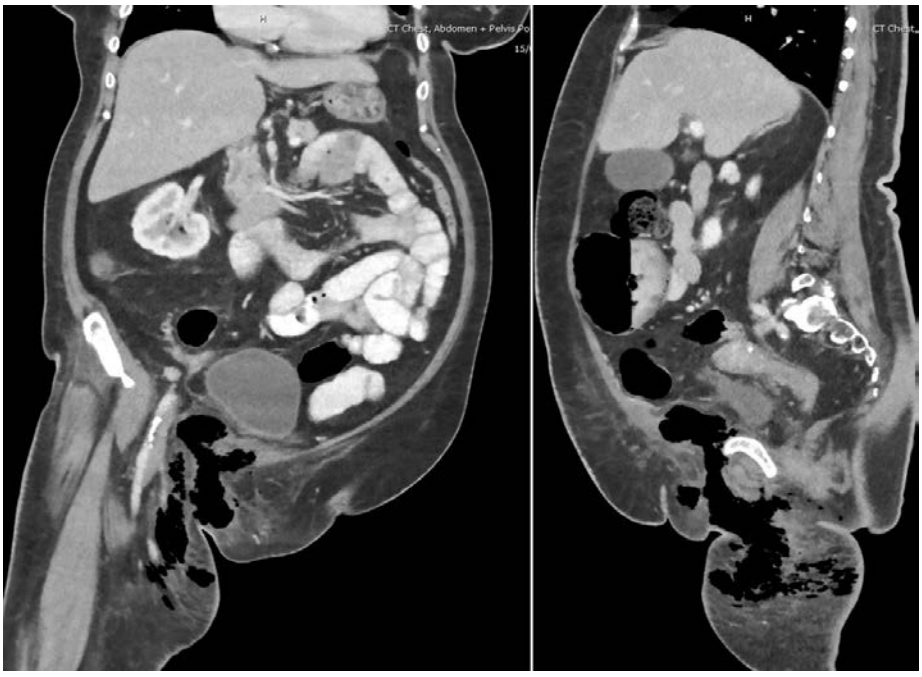

Figure 2. Left: Coronal view of extended abdominal CT. Right: A sagittal view of the same patient showing extensive soft tissue gas

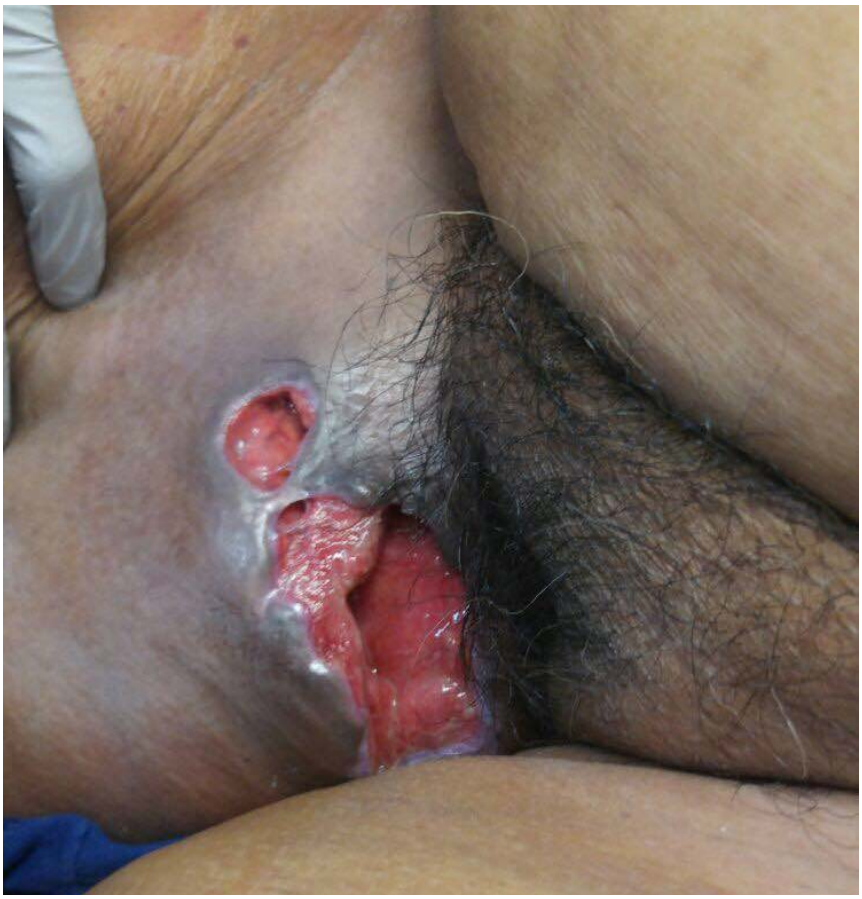

Figure 3. A clinical photograph showed a sinus lined with healthy granulation tissue

To our knowledge, this is the first case of survival of a patient with necrotizing fasciitis managed by a non-operative approach. Nonetheless, the applicability of this isolated case is indeed limited. Non-operative management of extensive soft tissue infections should not be encouraged. On the other hand, this case reflects our limited understanding of the heterogeneity of necrotizing fasciitis and poor understanding of its pathophysiology. It is not unrealistic to postulate that a certain indolent subtype of necrotizing fasciitis that presents without multi-organ dysfunction prevails, which can be managed with antibiotics alone if the disease pattern is better understood in the future.

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