

CASE REPORT

REGIONAL ANESTHESIA

Necrotizing fasciitis or acute limb ischemia? Similarities and the diagnostic tactics

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ABSTRACT

The symptoms of necrotizing fasciitis (NF) and acute limb ischemia (ALI) are almost identical. We present a case of a 48-year-old male, who reported to the emergency room complaining of sudden severe pain in the right limb. The complaint was accompanied by blackish, water-filled lumps, and numbness. On examination, his femoral pulse was palpable but the pulse was weak in the common femoral artery (CFA), superficial femoral artery (SFA) and popliteal artery (POP A). No pulse was palpable in the posterior tibial artery (PTA), anterior tibial artery (ATA), and dorsalis pedis artery (DPA). SpO₂ couldn't be detected in first to fourth toes; it was 97% in the fifth toe. The laboratory investigations showed increased serum creatinine, so CT angiography could not be performed. Duplex Ultrasonography (DUS) was performed and showed triphasic morphology at the vascular level, while gas was seen in the subcutaneous tissues. Due to similar clinical appearances, it is difficult to differentiate the diagnosis of NF and ALI, while the treatments for both are very different. CT angiography, DUS examination and laboratory tests may be the first option to differentiate between the two conditions.

Keyword: Necrotizing Fasciitis, Acute Limb Ischemia,

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1. INTRODUCTION

A fatal soft-tissue infection, known as necrotizing fasciitis (NF), has a fulminant course with a high mortality rate. NF may be challenging to diagnose since it often presents as a benign lesion and lacks peculiar diagnostic signs in its early stages. Moreover, the symptoms of NF and acute limb ischemia (ALI) are identical. We present a case of NF which mimicked ALI to highlight the importance of high suspicion and discrete, repeated review of the lesions to reach to a correct diagnosis.

2. CASE REPORT

A 48-year-old male came to the emergency room, referred from another hospital, complaining of sudden

severe pain in the right limb with a pain scale 9 out of 10. These complaints were accompanied by blackish, water-filled lumps, and numbness. His medical history shows that he has type II diabetes mellitus, which was diagnosed 3 months ago, and he has a history of smoking for 20 y. A physical examination revealed he was hemodynamically unstable, with a blood pressure of 94/61 mmHg on support of epinephrine 50 ng, heart rate of 105 beats/min, and respiratory rate of 22 times/min. His body mass index was 31.25 kg/m² (obese grade I). Examination of his right limb revealed hyperpigmentation with bullae (+). The soles of his feet appeared pale and cold with decreased saturation in all of his fingers. On examination, the femoral pulse was positive but weak when taken from the common femoral

artery (CFA) and superficial femoral artery (SFA) and popliteal artery (POP A) and absent when taken from the posterior tibial artery (PTA), anterior tibial artery (ATA), and dorsal pedis artery (DPA). The clinical presentation can be seen in Figure 1.



Figure 1: Clinical presentation of the right limb

Saturation at first to fourth toes could not be detected, and saturation at fifth toe was 97%. ECG and chest X-ray were within normal limits. Laboratory exam showed a decreased Hb to be 9.4 g/dL (normal range 13.3–16.6), and increase in white blood cells count of $26.330 \times 10^3/\mu\text{L}$ (normal range $3.37\text{--}10 \times 10^3/\mu\text{L}$), serum creatinine 6.2 mg/dL (normal range 0.51–0.95), blood urea nitrogen 62.9 mg/dL (normal range 16.6–48.5), a high level of D-Dimer > 10.000 (normal range < 0.5), C-reactive protein (CRP) 22.29 mg/dL (normal range < 0.5).

Due to high serum creatinine, the patient was unable to undergo CT angiography. Duplex Ultrasonography (DUS) was performed and showed triphasic morphology at the right common femoral artery (CFA), superficial femoral artery (SFA) and popliteal artery (POP A), posterior tibial artery (PTA), anterior tibial artery (ATA), and dorsal pedis artery (DPA) (Figure 2A). From the ultrasound, we could see that there was gas in the subcutaneous tissues (Figure 2B).

The patient underwent debridement and amputation of the first to fourth toes by the surgeon. Blood cultures and antibiotic sensitivity tests were performed. *Bacillus cereus* were identified, and antibiotic therapy (Meropenem) was started. DM was controlled with insulin, and the deranged renal function improved with the resolution of the inflammatory condition. Following improvement in renal function, the patient underwent CT angiography, which showed fine vascularization (Figure 3).

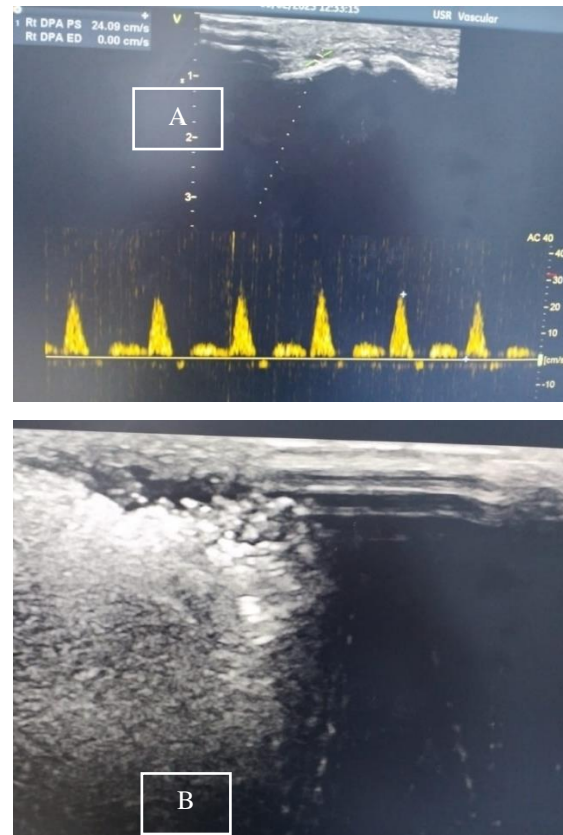


Figure 2: (A) DUS showed a normal arterial flow (B) Gas appearance in the subcutaneous tissue

3. DISCUSSION

Lower extremity pain and skin ulceration is a serious clinical issue. Clinically, it may be difficult to distinguish NF and ALI, because the complaints and clinical appearance are quite similar, but the management of each of the two is very different. In both, anamnesis may present with sudden onset of severe leg pain, but nerve complaints, such as paresthesia, are more likely to be presented with ALI. While discoloration can be found clinically in both; NF is more often accompanied by bullae, while ALI is not.^{1,2} NF is often accompanied by unstable hemodynamic conditions due to sepsis.³ Both are frequently seen in immunocompromised patients. In our case, from the history and the physical examination, it was still difficult to differentiate, because the complaints and the appearance were not specific enough. So, an additional examination was needed in the form of laboratory and imaging modalities.

In NF, there can be occlusion of small arteries and even superficial nerve damage; clinically oxygen saturation in the extremities cannot be measured, and paresthesia can occur. This is a symptom that can also be found in ALI.⁴



Figure 3: Arteriography shows patient's leg vessels

NF is commonly associated with elevated white blood cell count over 15,000, elevated inflammatory markers such as CRP, and the presence of abnormal coagulation markers.⁵ On the other hand, the pathophysiologic basis of ALI is hypercoagulability, so laboratory similarities are also likely to be found in NF and ALI.⁶ Deranged renal and liver function tests can be found in NF;⁵ this is likely due to a massive inflammatory response. The presence of WBCs surrounding the fascia and fatty tissue are examples of microscopic findings that are useful in

diagnosing NF, although it might take several days to receive the results of such tests.⁷

An imaging examination has a high diagnostic value to confirm ALI. But in this case, the impairment of renal function necessitated us to postpone the arteriography. However, ultrasonography imaging may be the preferred modality, as it tends to be non-invasive but can still make a significant difference in diagnosing between these two diseases.⁸ A triphasic wave appearance shows no impairment of arterial flow. In the setting of suspected NF, DUS can rule out vascular abnormalities and may show a subcutaneous gas picture.^{9,10} If NF is suspected we can use the Laboratory Risk Indicator for Necrotizing Fasciitis score (LRINEC) to further understand the possibility of NF. If the score < 6, there is a low risk; a score of 6–7, intermediate risk; and 8–12 indicates a high risk.¹¹ In this study, our patient had a LRINEC score of 10.

4. CONCLUSION

Due to similar clinical appearances, it is difficult to differentiate the diagnosis of necrotizing fasciitis and acute limb ischemia, while the management for both is very different. In a time-critical situation, DUS examination and laboratory tests may be the first option to differentiate between the two diagnoses.

5. Acknowledgement

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6. Conflict of interest

The study utilized the hospital resources only, and no external or industry funding was involved.

7. Authors' contribution

MA: Concept, conduction of the study work

TSP: Conduction of the study, literature search

IMS: Manuscript editing

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