

A rapidly progressive painful skin lesion

Erika Poggiali, Giovanni Santilli, Andrea Vercelli

Emergency Department, Guglielmo da Saliceto Hospital, Piacenza, Italy



A 48-year-old woman presented to our emergency department with fever and a severe painful erythematous and ecchymotic skin lesion on the third finger of the left hand, that rapidly evolved into haemorrhagic bullae with diffuse swelling and edema of all her left hand, associated with the onset of lymphangitis in her left arm and crescendo-like pain. She denied trauma or insect bite. Her past medical history was unremarkable, except for chilblains with no sequelae. She did not take any medication. She was not a smoker. Laboratory tests showed neutrophilic leucocytosis (WBC 15,000/mm³; N 14,500/mm³), a slight thrombocytopenia (139,000/mm³), elevated C-reactive protein (12 mg/dL, normal value <0.5), increased procalcitonin (1.3 ng/mL, normal value <0.5) and transaminases (AST 64 U/L; ALT 70 U/L, normal value 0-31). HIV was excluded.

Question

Given the patient's history and her skin lesions, what is the most likely diagnosis?

1. Raynaud's ulcer
2. Pyoderma gangrenosum
3. Necrotizing fasciitis
4. Scleroderma skin ulcer

Correspondence: Erika Poggiali, Emergency Department, "Guglielmo da Saliceto" Hospital, Via Giuseppe Taverna 49, Piacenza, Italy.
Tel.: +39.0523.303044
E-mail: E.Poggiali@ausl.pc.it

Key words: *Streptococcus pyogenes*; necrotizing fasciitis; skin necrosis; soft tissue infection; necrotizing cellulites; streptococcal gangrene.

Contributions: EP, GS and AV collected details of the case and cared for the patient. EP drafted the manuscript. AV critically revised the manuscript. All the authors approved the final version.

Conflicts of interest: EP is member of the editorial board of Emergency Care Journal. The authors declare no conflict of interest.

Funding: none.

Availability of data and materials: all data underlying the findings are fully available upon reasonable request to Erika Poggiali, E.Poggiali@ausl.pc.it

Ethics approval and consent to participate: As this was a descriptive case report and data was collected without patient identifiers, ethics approval was not required under our hospital's Institutional Review Board guidelines.

Informed consent: the patient provided consent for the access to medical records at the time of admission.

Received for publication: 30 November 2022.

Revision received: 24 January 2023.

Accepted for publication: 24 January 2023.

This work is licensed under a Creative Commons Attribution 4.0 License (by-nc 4.0).

©Copyright: the Author(s), 2023

Licensee PAGEPress, Italy

Emergency Care Journal 2023; 19:11046

doi:10.4081/ecj.2023.11046

Publisher's note: all claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article or claim that may be made by its manufacturer is not guaranteed or endorsed by the publisher.

Answer

Necrotizing Fasciitis (NF) is the right answer. The patient was immediately treated with parenteral empiric broad-spectrum antibiotics (piperacillin/tazobactam and clindamycin) and surgical debridement. Blood and tissue culture grew methicillin-sensitive *Streptococcus pyogenes*.

NF is a rare life-threatening bacterial soft tissue infection that rapidly spreads along soft tissue planes, causing progressive destruction of the muscle fascia and subcutaneous fat.¹ Prompt diagnosis and timely treatment are crucial to avoid devastating consequences, including limb loss, organ damage and death. Patients with comorbidities such as immunosuppression, malignancy, vascular disease, diabetes, alcoholism, and obesity are at an increased risk of NF with poor prognosis.² Diagnosis is made clinically with the presence of skin discoloration, bullae, palpable crepitus, and pain disproportionate to the clinical findings. Fever is sometimes present. Elevated concentrations of CK or AST suggest deep tissue infection. Confirmatory diagnosis is based upon a culture and Gram stain of specimens collected from deep tissue, or by positive blood cultures. NF is classified into two types: polymicrobial (type 1) and monomicrobial (type 2) NF.³ Type 1 NF is more common in older patients with risk factors, and typically located at the trunk, abdominal wall, perianal and groin areas, and in post-operative wounds. Type 2 NF is commonly caused by invasive Group A *Streptococci* (GAS)-pyogenesis in healthy immunocompetent patients, and usually located in the head, neck, or extremities. Initial superficial injury may be undetectable and severe signs and symptoms may not manifest until the underlying tissue damage has progressed extensively, as in our case. Plain X-ray is not recommended as an initial or definitive imaging study for NF. CT and MRI may show edema extending along the fascial plane, although these findings may be absent in early stages of NF.⁴ Surgical intervention should not be delayed in order to perform diagnostic imaging. Surgery is the gold standard treatment: exploration and debridement of the affected tissue should be performed promptly, and subsequent debridement should be continued daily until all necrotic tissue has been removed.^{5,6} Antibiotic treatment is mandatory to support the surgical therapy. The most recent guidelines recommend vancomycin or linezolid in combination with piperacillin-tazobactam, a carbapenem, or ceftriaxone-metronidazole. Clindamycin should also be included in empiric therapy due to its effect on toxins released by *S. aureus* and GAS.⁵ The role of hyperbaric oxygen therapy and I.V. immunoglobulin G remains controversial.⁷

References

1. Chen LL, Fasolka B, Treacy C. Necrotizing fasciitis: A comprehensive review. *Nursing* 2020;50:34-40.
2. Misiakos EP, Bagias G, Patapis P, et al. Current concepts in the management of necrotizing fasciitis. *Front Surg*. 2014;1:36.
3. Lancerotto L, Tocco I, Salmaso R, Vindigni V, Bassetto F. Necrotizing fasciitis: classification, diagnosis, and management. *J Trauma Acute Care Surg* 2012;72:560-6.
4. Henry SM, Davis KA, Morrison JJ, Scalea TM. Can necrotizing soft tissue infection be reliably diagnosed in the emergency department? *Trauma Surg Acute Care Open* 2018;3:e00015.
5. Stevens DL, Bisno AL, Chambers HF, et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. *Clin Infect Dis* 2014;59:e10-e52.
6. Leiblein M, Marzi I, Sander AL, et al. Necrotizing fasciitis: treatment concepts and clinical results. *Eur J Trauma Emerg Surg* 2018;44:279-90.
7. Stevens DL, Bryant AE. Necrotizing soft-tissue infections. *N Engl J Med* 2017;377:2253-65.