Ecthyma Gangrenosum of Scrotum in a Patient with Neutropenic Fever: A Case Report

Jose A. Rodriguez
Paula A. Eckdart
Juan C. Lemos-Ramirez
Jianli Niu

Corresponding Author: Paula A. Eckardt, e-mail: peckardt@mhs.net
Conflict of interest: None declared

Patient: Male, 68
Final Diagnosis: Ecthyma gangrenosum
Symptoms: Abdominal discomfort • fever • genital ulcer
Medication: —
Clinical Procedure: Antibiotic treatment
Specialty: Infectious Diseases

Objective: Rare co-existence of disease or pathology

Background: Ecthyma gangrenosum is an uncommon cutaneous infection commonly caused by Pseudomonas aeruginosa affecting typically immunocompromised patients. The presence of ecthyma gangrenosum can be associated with severe systemic infection often with a fatal prognosis. Most cases of ecthyma gangrenosum occur around the axilla, buttocks, and limbs; the scrotum is rarely affected.

Case Report: A 68-year-old male with previously diagnosed acute myeloid leukemia, presented with left scrotal pain, fever, and rigors. Physical examination showed 2 ulcerating lesions with central black eschars surrounded by erythematous halos on the superior aspect of the left scrotum. Diagnosis of ecthyma gangrenosum was confirmed as both blood and lesion cultures showed growth of P. aeruginosa. After early empiric antibiotic treatment, the lesions significantly improved, and no sign of recurrence or new lesions was noticed.

Conclusions: Ecthyma gangrenosum should be considered in the differential diagnosis of ulcerating lesions of the scrotum. An early diagnosis and aggressive antibiotic treatment are imperative for resolution of this infection.

MeSH Keywords: Ecthyma • Febrile Neutropenia • Leukemia, Myeloid, Acute • Pseudomonas aeruginosa • Scrotum

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/917443

Conflict of interest: None declared

Authors' Contribution:
Study Design: A
Data Collection: B
Statistical Analysis: C
Data Interpretation: D
Manuscript Preparation: E
Literature Search: F
Funds Collection: G

1 Department of Internal Medicine, Memorial Hospital West, Memorial Healthcare System, Pembroke Pines, FL, U.S.A.
2 Division of Infectious Disease, Memorial Regional Hospital, Memorial Healthcare System, Hollywood, FL, U.S.A.
3 Office of Human Research, Memorial Healthcare System, Hollywood, FL, U.S.A.

This work is licensed under Creative Common Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)
Case Report

A 68-year-old Caucasian male with a history of acute myeloid leukemia presented to Memorial Hospital West Emergency Department complaining of abdominal pain, fever, and genital ulcers. He was currently on chemotherapy with daunorubicin and cytarabine. He had a blood pressure of 81/53 mm Hg and heart rate of 75 beats per minute requiring aggressive intravenous fluid resuscitation for volume expansion. He was found to have 2 necrotic ulcers with black eschars on the left scrotum with induration (Figure 1). Laboratory analysis was significant for leukopenia (400 white blood cells/µL) with an absolute neutrophil count of 200/µL, anemia (4.3 g/dL hemoglobin) with a hematocrit of 12.6%, and thrombocytopenia (7000/µL platelets). An uncompensated metabolic acidosis (4.0 mmol/L lactic acid venous) also and increased level of blood urea nitrogen (30 mg/dL BUN) were observed. A diagnosis of ecthyma gangrenosum with a matrix-assisted laser desorption/ionization-time of flight mass spectrometry was confirmed, the susceptibly reported as pan sensitive P. aeruginosa bacteremia in the setting of post-chemotherapy neutropenia.

The presence of ecthyma gangrenosum is indicative of bacteremia caused by P. aeruginosa, an opportunistic bacterium that can be found on the skin, in the nose and throat, and is mostly implicated in hospital acquired infections with multidrug resistant and a mortality rate ranging from 16% to 90% [6–8]. In our case, blood and wound cultures revealed P. aeruginosa bacteremia that was further confirmed by flight mass spectrometry [5]. Also, other bacterial and fungal pathogens including Aeromonas, Escherichia coli, Klebsiella pneumonia, various Pseudomonas species, Candida, Aspergillus, and Zygomycetes have been reported to cause ecthyma gangrenosum with or without septicemia [7,9–11].

Ecthyma gangrenosum typically occurs in immunocompromised patients with conditions such as neutropenia, chemotherapy, hematologic malignancies, immunodeficiency syndromes, severe burns, malnutrition, immunosuppressive therapy, and diabetes mellitus [11]. This is specifically true for our patient, who had severe neutropenia, secondary to both the hematological disorder and its aggressive therapy, later developed ecthyma gangrenosum. It should be noted that there have been rare case reports of ecthyma gangrenosum occurred in previously healthy children [2,12,13]. In such cases, an immunological evaluation should be performed to rule out underlying immunodeficiencies, because 50% of these individuals may have a primary subclinical immunodeficiency or unrecognized underlying medical conditions [3,12,14]. It has been reported that severe P. aeruginosa infection can occur in previously healthy children with a mortality rate of 55% [13].

In cases of ecthyma gangrenosum, early recognition and management with empirical antibiotics is essential due to rapid
disease progression. Antibiotics with spectrum for *P. aeruginosa* including cephalosporins, β-lactam penicillin such as piperacillin with an aminoglycoside or fluoroquinolone are recommended [15]. Surgical excision and skin grafting are indicated if no improvement of the lesions after aggressive antibiotic treatment, because ecthyma gangrenosum manifests as necrotizing soft-tissue lesion, carrying a high mortality rate [16,17]. In our case, the patient was started on broad-spectrum antibiotics prior to the return of the blood and wound culture, and a quick curative effect was achieved. The lesions were significantly improved, becoming rapidly smaller with no tender, and follow-up visits revealed no sign of recurrence or new lesions.

### Conclusions

We describe a patient with acute myeloid leukemia who developed *P. aeruginosa* ecthyma gangrenosum on the left scrotum after chemotherapy, and who responded well to systemic combined antibiotics. Our case illustrates the rare presentation of scrotal ecthyma gangrenosum. This case highlights the importance of early diagnosis and aggressive antimicrobial treatment if there is clinical suspicion of ecthyma gangrenosum.

### Conflicts of interest

None.

---

### References:

1. Karimi K, Odhay A, Kollipara R et al: Acute cutaneous necrosis: A guide to early diagnosis and treatment. J Cutan Med Surg, 2017; 21: 425–37
2. Vaiman M, Lazarovitch T, Heller L, Lotan G: Ecthyma gangrenosum and ecthyma-like lesions: Review article. J Clin Microbiol Infect Dis, 2015; 34: 633–39
3. Martínez-Longoria CA, Rosales-Solis GM, Ocampo-Garza J et al: Ecthyma gangrenosum: A report of eight cases. An Bras Dermatol, 2017; 92: 698–700
4. Greene SL, Su WP, Muller SA: Ecthyma gangrenosum: Report of clinical, histopathologic, and bacteriologic aspects of eight cases. J Am Acad Dermatol, 1984; 11: 781–87
5. Cabrol N, Sautet M, Bertrand X, Hocquet D: Matrix-assisted laser desorption ionization-time of flight mass spectrometry identifies Pseudomonas aeruginosa high-risk clones. J Clin Microbiol, 2015; 53: 1395–98
6. Henry D, Speert D: Pseudomonas. In: Versalovic J, Carroll K (eds.) Manual of clinical microbiology, 10th ed. Washington, DC: ASM Press, 2011; 677–91
7. Mandell, Geral L et al: Pseudomonas aeruginosa and other Pseudomonas species. In: Mandel GL, Dolin R (eds.), Principles and practice of infectious diseases, Saunders, Elsevier, 2015; 2518–31
8. Maschmeyer G, Braveny I: Review of the incidence and prognosis of *Pseudomonas aeruginosa* infections in cancer patients in the 1990s. Eur J Clin Microbiol Infect Dis, 2000; 19: 915–25
9. Reich H, Williams Fadey D, Nak N et al: Non-pseudomonal ecthyma gangrenosum. J Am Acad Dermatol, 2004; 50: S114–17
10. Jiang Y, Al-Hatmi AM, Xiang Y et al: The concept of ecthyma gangrenosum illustrated by a fusarium oxysporum infection in an immunocompetent individual. Mycopathologia, 2016; 181: 759–63
11. el Baze P, Thyss A, Vinti H et al: A study of nineteen immunocompromised patients with extensive skin lesions caused by *Pseudomonas aeruginosa* with and without bacteremia. Acta Derm Venereol, 1991; 71: 411–15
12. Zomorrodí A, Wald ER: Ecthyma gangrenosum: Considerations in a previously healthy child. Pediatr Infect Dis J, 2002; 21: 1161–64
13. Viola L, Langer A, Pulitano S et al: Serious *Pseudomonas aeruginosa* infection in healthy children: Case report and review of the literature. Pediatr Int, 2006; 48: 330–33
14. Baro M, Marin MA, Ruiz-Contreras J et al: *Pseudomonas aeruginosa* sepsis and ecthyma gangrenosum as initial manifestations of primary immunodeficiency. Eur J Pediatr, 2004; 163: 173–74
15. Paul M, Leibovici L: Combination therapy for Pseudomonas aeruginosa bacteremia: Where do we stand? Clin Infect Dis, 2013; 57: 217–20

16. Khalil BA, Baillie CT, Kenny SE et al: Surgical strategies in the management of ecthyma gangrenosum in paediatric oncology patients. Pediatr Surg Int, 2008; 24: 793–97

17. Zhang X, Jin W, Ma X et al: Ecthyma gangrenosum in a 3-month-old, previously healthy infant: A case report. Medicine (Baltimore), 2017; 96: e6244