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

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Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

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

Objective: Rare co-existance 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

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Background

Infections are the most common complications with high morbidity and mortality for patients with acute myeloid leukemia. These patients are at particularly high risk of infection, likely related to the intensity of their therapy resulting in profound neutropenia. Ecthyma gangrenosum is an uncommon cutaneous manifestation most often seen in patients who are immunocompromised, with an approximate incidence of 19% [1,2]. It can be a potentially fatal systemic infection with a high mortality rate, ranging from 38% to 77% [3]. Most previous reports indicated that the skin lesions are most commonly seen in axilla, buttocks, and limbs but scrotal ecthyma gangrenosum is uncommon [2,4]. We report a patient with acute myeloid leukemia who developed ecthyma gangrenosum of left scrotum associated with *Pseudomonas aeruginosa* bacteremia in the setting of post-chemotherapy neutropenia.

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 *P. aeruginosa* septicemia was suspected, and the patient was started empirically on intravenous therapy (IV) with amikacin (1 g, once a day), metronidazole (500 mg, 3 times a day), cefepime (2 g, 3 times a day) and vancomycin (15 mg/kg, 2 times a day) after collecting blood and skin lesion samples. Aerobic blood culture and wound cultures showed growth of Gram-negative bacilli, and MacConkey Agar media plate showed a non-lactose fermenter organism. *P. aeruginosa* was confirmed with a matrix-assisted laser desorption/ionization-time of flight mass spectrometry (MALDI-TOF, Biomerieux) [5]. Thus, a diagnosis of ecthyma gangrenosum with *P. aeruginosa* septicemia was confirmed, the susceptibly reported as pan sensitive and the treatment was continued with cefepime (2 g, 3 times a day, IV) alone for 14 days from first negative blood culture. The patient underwent a full recovery. There was a significant improvement of the lesions, and no sign of recurrence or new lesions was observed on follow-up visits.

Discussion

An early diagnosis of ecthyma gangrenosum is based on the clinical characteristics of lesions. The first skin lesion can be expressed as an erythematous macule that subsequently becomes small indurated erythematous base with rim, progressing rapidly (12–18 hours) into a necrotic ulcer with surrounding erythema and a central black eschar [2,4]. Single or multiple lesions can be seen in any skin or cutaneous membranes of the body, as seen in our case ecthyma gangrenosum was found in the left scrotum, making it an unusual and more challenging location to diagnose. On biopsy perivascular hemorrhage vasculitis and infiltration of neutrophilic granulocytes with central necrosis and surrounding bacilli can be seen in ecthyma gangrenosum lesions, which establishes a definitive diagnosis [4]. Differential diagnosis should consider pyoderma gangrenosum, cutaneous anthrax, necrotizing fasciitis, heparin or warfarin induced necrosis, cocaine-induced skin necrosis, embolic phenomenon and necrosis secondary to the use of vasoactive drugs [6].

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

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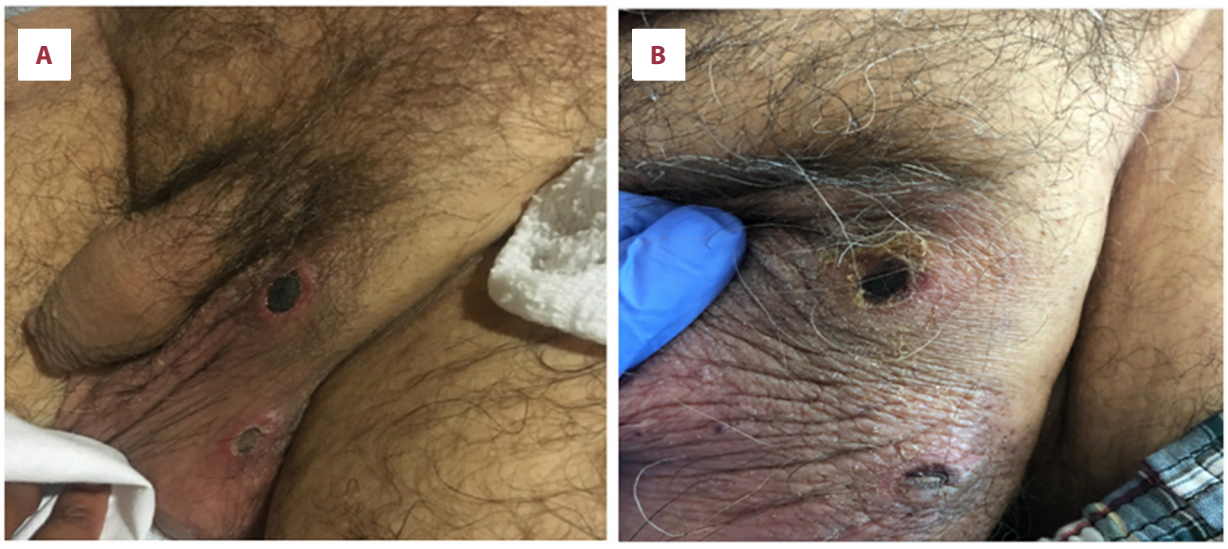

Figure 1. Ecthyma gangrenosum of the left scrotum. Two ulcerating lesions with black eschars surrounded by erythematous halos on the superior aspect of the left scrotum caused by *Pseudomonas aeruginosa.* (**A**) Scrotum ventral aspect; (**B**) Scrotum dorsal aspect.

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, Odhav 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. Eur 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. Cabrolier N, Sauget 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 HL, Williams Fadeyi D, Naik NS 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. Zomorrodi A, Wald ER: Ecthyma gangrenosum: Considerations in a previously healthy child. Pediatr Infect Dis J, 2002; 21: 1161–64
13. Viola L, Langer A, Pulitanò 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, Marín 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

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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

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