

Ecthyma Gangrenosum without Pseudomonas Bacteraemia in an Immunocompetent Healthy Adult

Case Study

El-Sherif NA¹, El-Mangush IM¹, El-Dibany SA^{2*}

¹ Dermatology Department, Benghazi university, Gamhoria hospital, Benghazi, Libya.

² Dermatology Department, Omar El-Mukhtar university, Al-Beida, Libya.

Keywords: *Ecthyma* Gangrenosum; *Pseudomonas Aeruginosa*; Healthy Subjects.

Introduction

Pseudomonas aeruginosa may be presented with mild cutaneous infections in healthy persons like a toe web infections, hot tub folliculitis, however, in persons with lowered resistance, more severe infections such as malignant otitis externa and necrotizing fasciitis are observed [1]. *Ecthyma gangrenosum (EG)*, the characteristic skin symptom of *Pseudomonas septicemia*, occurs in debilitated or in immunocompromised patients [2, 3]. There are isolated reports of its occurrence in normal healthy individuals with no evidence of bacteremia [4].

Case Presentation

A 62-year-old Libyan female patient was admitted to dermatology department at El-Jamhoria hospital in Benghazi, with a 1-month history of painful ulcer on the skin over her left breast. She was a febrile and in good condition. Local skin examination revealed a single necrotic ulcerated skin lesion covered with central black eschar was present over her left breast skin surrounded by an intense red areola. Two other smaller lesions with the same features were present (Figure 1). The laboratory findings revealed: peripheral WBC count 1600 mm³ of which 69% were neutrophils, 24.5% were lymphocytes, and 6.3% were monocytes; hemoglobin 11.4g/ dL and platelets 243 x 10³/L. Test results for both syphilis and HIV were negative. Liver function tests, blood urea nitrogen and serum creatinine levels, and chest radiographs were normal. *Pseudomonas aeruginosa* was isolated from the necrotic ulcerated skin lesion. whereas the results of repeated blood cultures were negative.

Histopathological examination of skin biopsy from the ulcer showed a necrotic epidermis with dermal infiltrate of a moderate number of lymphocytes, and neutrophils pronounced in the perivascular area (Figure 2, 3). The diagnosis of *EG* associated with *Pseudomonas* infection was made. The patient was treated with intravenous ceftriaxon 1 g IV every 12 hours and three days later gentamicin 100 mg IV every 8 hours has been added according to the result of culture everyitivity, this combination therapy was continues for six weeks. Local application of Silver sulfadiazine cream with surgical debridement were also instituted for better wound healing (Figure 4, 5). Two months later the skin lesion completely healed.

Discussion

EG was first described in 1897 as a cutaneous manifestation of *Pseudomonas aeruginosa* bacteremia [5]. This disease had been related to life-threatening septicemic infections with high mortality [2]. It occurs mostly in immunocompromised patients with leukemia, lymphoma and other malignant diseases, especially in the presence of severe neutropenia, furthermore *EG* reported in severe burns or organ transplant, or in people receiving immunosuppressive therapy [2, 3, 6]. However, it has been reported also in patients without previously identified medical problems [3-5].

Although *EG* is now known to be caused by a variety of bacteria and fungi, it still considered to be pathognomonic for *P. aeruginosa* infection and it continues to be the most common cause [4, 7].

The lesion begins with a painless well-circumscribed edematous papule that subsequently, evolves to a hemorrhagic bulla that rup-

*Corresponding Author:

Salwa A. El-Dibany,
Dermatology Department, Omar El-Mukhtar university, Al-Beida, Libya.
E-mail: salwaeldibani@yahoo.com

Received: December 23, 2016

Accepted: February 01, 2017

Published: February 02, 2017

Citation: El-Sherif NA, El-Mangush IM, El-Dibany SA (2017) Ecthyma Gangrenosum without Pseudomonas Bacteraemia in an Immunocompetent Healthy Adult. *Int J Clin Dermatol Res*, S2:001, 1-3. doi: <http://dx.doi.org/10.19070/2332-2977-SI02001>

Copyright: El-Dibany SA® 2017. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Figure 1. A Necrotic Ulceration of the Breast Skin and Scattered Small Ulcerated Erythematous Papules.



Figure 2. Ulceration and Epidermal Necrosis with Inflammatory Cell Infiltration. (Hematoxylin and Eosin Stain (H&E); Original Magnification Power 40x100).



Figure 3. Ulcer with Inflammatory Cellular Infiltrate. (Hematoxylin and Eosin Stain (H&E); Original Magnification Power 40x10).

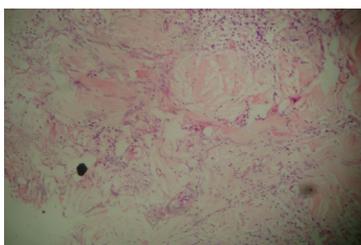


Figure 4. Ulcer After Surgical Debridement of the Necrotic Lesion and Initiation of Systemic Antibiotics.



Figure 5. Healing of the Ulcer after Complete Course of Antibiotic.



tures, forming a necrotic ulcer with a gray-black eschar surrounded by an erythematous halo. Certain localizations are particularly affected such as the perineum (57%), the extremities (30%) and trunk (6%), furthermore, fever is noticed in 96% of cases [4].

The pathogenic mechanism for the cutaneous lesion started with

bacterial invasion of the arteries in the dermis and subcutaneous tissues occurs by hematogenous seeding in septicemic patients and by direct inoculation in non-bacteremic ones. Subsequently a necrotizing vasculitis caused by obstruction of the dermal vessels and dissolution of the elastic lamina of blood vessels by *Pseudomonas* elastase and exotoxin A were responsible for the direct

tissue destruction and ulcerative lesions [8, 9].

Treatment should begin on the basis of clinical findings without waiting for laboratory confirmation. The recommended treatment is an antipseudomonal beta-lactam antibiotic combined with an aminoglycoside appropriate for both bacteremic and non-bacteremic *EG* [11]. Moreover, surgical debridement has been also recommend along with skin grafting when needed [2].

The synergistic effect with the combination of beta-lactams and aminoglycosides, with the risk of development of resistant strains with monotherapy have made the combination therapy a preferred mode, furthermore, the reduction of mortality rate among patients with invasive infections received combination therapy compared with monotherapy has been reported [11]. Our patient received combination therapy along with surgical debridement of the necrotic ulcer to promote its healing.

Mortality rates of patients with *EG* vary between 35% and 90% depending on the severity of the underlying sepsis [3], while in patients without documented bacteremia, mortality rates can be as low as 15% [12]. Furthermore, the mortality rate was 7.5 % in the group of patients with skin lesions considered to be primary and 20 % in the group of patients with skin lesions considered to be secondary to bacteremia [4].

Conclusion

Dermatologist must be aware of these conditions and consider *EG* as a likely diagnosis when facing a healthy adult with skin lesions such as those described above even with a negative blood cultures. In this situation, prompt debridement, and initiation of antibiotics with appropriate coverage against *Pseudomonas* species should be initiated.

References

- [1]. Agger WA, Mardan A (1995) *Pseudomonas aeruginosa* infections of intact skin. *Clin Infect Dis.* 20(2): 302-8.
- [2]. Singh N, Devi M, Devi S (2005) *Ecthyma gangrenosum*: a rare cutaneous manifestation caused by *pseudomonas aeruginosa* without bacteremia in a leukemic patient. *Indian J Dermatol Venereol Leprol.* 71(2): 128-129.
- [3]. Bodey GP, Jadeja L, Elting L (1985) *Pseudomonas* bacteremia: retrospective analysis of 410 episodes. *Arch Intern Med.* 145(9): 1621-1629.
- [4]. Gençer S, Ozer S, Ege Gül A, Doğan M, Ak OP (2008) *Ecthyma gangrenosum* without bacteremia in a previously healthy man. *Case report. J Med Case Rep.* 2: 14.
- [5]. Colette CM, Scarfone RJ, Conway D (2000) *Ecthyma gangrenosum* as a manifestation of *pseudomonas* sepsis in a previously healthy child. *Ann Emerg Med.* 36(4): 383-387.
- [6]. Tornerio C, Ricart C, Arnedo AL, Baeza R (1999) Non-bacteremic *ecthyma gangrenosum* in a patient with human immunodeficiency virus infection. *Rev Clin Esp.* 199(5): 332-333.
- [7]. Sen H, Inangil G, Sahin L, Dere K, Ozkan S, et al., (2009) *Ecthyma gangrenosum* like lesions associated with methicillin resistant *staphylococcus aureus* infection. *Int J Infect Dis.* 13(4): e173-5.
- [8]. Athappan G, Unnikrishna A, Chandraprakasam S (2008) *Ecthyma gangrenosum*: presentation in a normal neonate. *DOJ.* 14(2): 17.
- [9]. Sevinsky LD, Viécens C, Ballesteros DO, Stengel F (1993) *Ecthyma gangrenosum*: a cutaneous manifestation of *pseudomonas aeruginosa* sepsis. *J Am Acad Derm.* 29(1): 104-106.
- [10]. Song WK, Kim YC, Park HJ, Cinn YW (2001) *Ecthyma gangrenosum* without bacteraemia in leukaemic patient. *Clin Exp Dermatol.* 26(5): 395-397.
- [11]. Chan YH, Chong CY, Puthuchery J, Loh TF (2006) *Ecthyma gangrenosum*: a manifestation of *pseudomonas* sepsis in three paediatric patients. *Singapore Med J.* 47(12): 1080-1083.
- [12]. Varghese GM, Eapen P, Abraham S (2011) *Ecthyma gangrenosum* of a single limb. *Indian J Crit Care Med.* 15(3): 188-189.

Special Issue on

"Skin Diseases and Disorders"

Edited by:

Marc B. Roscher,

South African Society of Dermatological Surgery,
South Africa.

E-mail: mroscher@skincentre.co.za