

# Ecthyma gangrenosum-Source Reduction along with Empirical Antibiotics and Wound Care Helps to Treat Serious Infections

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## Abstract

Ecthyma gangrenosum (Eg) is a cutaneous necrotic lesion that is mostly seen in immunocompromised patients. It reflects a severe sepsis, possibly caused by *Pseudomonas aeruginosa*, an aerobic Gram-negative opportunistic pathogen that has a high risk of associated mortality in cases where the infection is systemic. These skin lesions may be seen on admission or can develop later. The recognition of Eg lesions permits the earliest possible introduction of the most effective antimicrobial therapy, which is a key prognostic factor for survival. A 52-year-old male patient admitted to the surgery department presented a sepsis associated green color pus discharge with pain and swelling. An empiric antibiotic therapy was prescribed. Five days after admission, pus culture was positive for *Pseudomonas aeruginosa*. As a result, the decision was made to continue the antibiotic therapy. Empiric therapy leads to granulation tissue formation. Eg can be treated with simple antibiotic therapy.

**Keywords:** Ecthyma gangrenosum, *pseudomonas aeruginosa*, sepsis

## INTRODUCTION

Ecthyma gangrenosum (Eg) is a rare but typical skin manifestation, most commonly caused by *Pseudomonas aeruginosa*, an aerobic Gram-negative opportunistic pathogen that has a high risk of associated mortality in cases where the infection is systemic.<sup>[1,2]</sup> These skin lesions may be seen on admission or can develop later. The recognition of Eg lesions permits the earliest possible introduction of the most effective antimicrobial therapy, which is a key prognostic factor for survival.

## CASE REPORT

### Patient presentation

Informed consent was obtained and the case details are presented here. A 52-year-old male patient was admitted to the surgery department with the complaint of nonhealing ulcer in the right leg associated with green color pus discharge, fever, pain, and swelling. He had no recent history of contact with contagious diseases or foreign travel, no familial medical problems, alcoholic. He was on treatment for hypertension (tablet amlodipine 2.5 mg twice daily and tablet atenolol 50 mg once daily) for the past 2 years and had received the appropriate immunizations.

His vital signs on admission included a temperature of 100°F, heart rate of 84 beats per min, respiratory rate of 22 breaths/min, and blood pressure of 140/80 mmHg. Systemic examination was normal. A 10 cm long necrotic lesion with green color pus discharge was found [Figure 1].

Two hours from admission, the urine, blood, and pus cultures were drawn, debridement of wound was done, and empiric intravenous ciprofloxacin (200 mg twice daily) and metronidazole (500 mg twice daily) was initiated. Dressing of wound was done regularly.

The white blood cell count was 10,000 cells per ml, the hemoglobin level was 9 g/dL, and the differential count was P-76%, L-21%, E-3%. The erythrocyte sedimentation rate was 22 mm/h. Fasting blood sugar was 112 mg/dL and postprandial blood sugar was 204 mg/dL. Total bilirubin level

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**Figure 1:** Ecthyma gangrenosum Stage I before treatment

was 1.5 mg/dL, direct bilirubin level was 0.5 mg/dL, aspartate transaminase (SGOT) was 60.0 mg/dL, and serum alkaline phosphatase was 226.0 mg/dL. Blood urea nitrogen level was 54 mg/dL and serum creatinine was 2.0 mg/dL.

Blood sugar level, liver function tests, blood urea nitrogen, and serum creatinine levels were increased. Chest radiographs, KUB, and Doppler study of both lower limb arteries and venous system were normal. After 5 days, pus culture test report revealed *P. aeruginosa* organism.

After 7 days due to the antibiotic treatment of intravenous ciprofloxacin and metronidazole, the infection was under control, granulation tissue is formed in the wound, and since *Pseudomonas aeruginosa* is an aerobic bacteria, the development of organism is prevented due to tight dressing of wound. The oral antidiabetic drugs such as metformin 500 mg and sitagliptin 100 mg was given once daily to control blood sugar level.

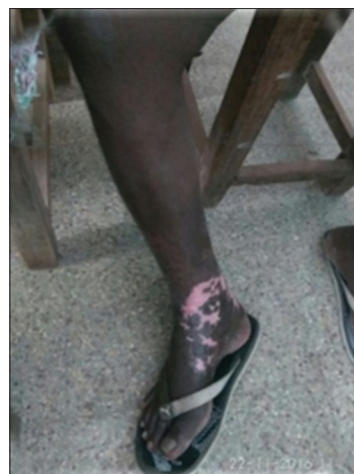
Since the infection was under control and the patient is alcoholic, the selection of other broad-spectrum antibiotic can cause the hepatotoxicity. Hence, the same antibiotic treatment was continued, and 2 months later, the skin lesion had healed [Figure 2].

## DISCUSSION

*P. aeruginosa* is an opportunistic bacterium, which can be found on the skin, in the nose and throat, and in the stools. It generally causes infection in immunocompromised patients with conditions such as neutropenia, immunodeficiency, and hypogammaglobulinemia.<sup>[3]</sup> The presence of *P. aeruginosa* infection in healthy individuals is very uncommon.<sup>[4]</sup>

In some reported cases of *P. aeruginosa* sepsis, the fever, diarrhea, pneumonia, skin lesions (50%), and shock are the most relevant associated symptoms.<sup>[5,6]</sup>

Eg is a well-recognized cutaneous manifestation of *P. aeruginosa* infection with or without septicemia.<sup>[7,8]</sup> It is described as an uncommon vasculitis, affecting the adventitia and media of



**Figure 2:** Ecthyma gangrenosum after treatment

blood vessels and caused from either hematogenous seeding of a pathogen or direct inoculation through the skin.<sup>[4]</sup>

The lesion begins as a painless red macule that enlarges and becomes a slightly elevated papule. It evolves to a hemorrhagic bulla that ruptures, forming a gangrenous ulcer with a gray-black eschar surrounded by an erythematous halo.<sup>[9]</sup>

In classic bacteremic Eg, the lesion represents a blood-borne metastatic seeding of *P. aeruginosa* to the skin. However, there are a few reports that Eg can represent localized skin eruptions that are not accompanied by bacteremia or systemic infection.<sup>[10]</sup>

Early diagnosis and aggressive therapy are important in the management of Eg. Patients with pseudomonas bacteremia have been reported to have a mortality rate of 38%.<sup>[11]</sup>

## CONCLUSION

As we point out in this case, Eg can occur in a previously healthy individuals with no other medical issues. Empiric antimicrobial therapy for Eg which includes ciprofloxacin and metronidazole is effective against pseudomonas.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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