

## Case Report

# Ecthyma Gangrenosum in a 37-Year-Old Woman Undergoing Adjuvant Chemotherapy for Breast Cancer

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## Keywords

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- Doxorubicin
- Cyclophosphamide

## Abstract

Ecthyma gangrenosum is the cutaneous manifestation of bacteremia traditionally associated with *Pseudomonas Aeruginosa* bacteremia. It classically presents as gunmetal grey bullae with a pink macular margin. To our knowledge, no case reports exist detailing the occurrence of ecthyma gangrenosum in a healthy young woman undergoing treatment for breast cancer. We present such a case to raise awareness of this entity in patients receiving chemotherapy.

## INTRODUCTION

Ecthyma gangrenosum is a serious cutaneous infection that usually occurs in immunocompromised patients with prolonged neutropenia. The pathogen is usually *Pseudomonas aeruginosa*, although other aggressive bacterial pathogens have also been described. If unrecognized in immunocompromised patients, it can have severe morbidity and mortality. Prompt diagnosis and appropriate antibiotic treatment can significantly lower the mortality.

We report the case of a previously healthy, 37-year-old woman who received adjuvant chemotherapy with doxorubicin and cyclophosphamide (AC) for stage IIA invasive ductal carcinoma of right breast. She presented with fever of 102°F (38.8°C), and blistering skin lesions on both legs after two cycles of chemotherapy. Cultures from the bullae grew *Pseudomonas aeruginosa*. A diagnosis of ecthyma gangrenosum was made and she responded promptly to antibiotic treatment.

## CASE REPORT

A 37-year-old premenopausal female was diagnosed with stage IIA invasive ductal carcinoma of the breast. She underwent lumpectomy and lymph node dissection. The tumor was 1.9 cm, grade 2, with one of 14 lymph nodes involved with metastasis. Angio lymphatic invasion was seen but no perineural invasion. The tumor was ER positive at 30%, PR negative, and HER-2/neu negative. She was otherwise healthy with no other past medical history except a previous breast biopsy for a benign breast cyst. She did not smoke or drink, had two children and

was a homemaker. She was started on adjuvant chemotherapy with a regimen of dose dense doxorubicin and cyclophosphamide every two weeks with pegfilgrastim after each cycle. Eight days after her second cycle of chemotherapy, she developed a fever to 102°F (38.8°C), severe malaise, a dry cough and lower extremity skin lesions. In the emergency room her white blood cell count was  $1.15 \times 10^9$  /liter, with absolute neutrophil count (ANC) of  $5.7 \times 10^8$  /liter. Physical examination was unremarkable except for two symmetrical 1 cm, hemorrhagic bullae with gray-black centers, and surrounding macular erythema extending approximately 3 cm circumferentially. The area was tender to palpation. There was no inguinal lymphadenopathy noted, but there was erythematous lymphangitic streaking from the shin towards the knee bilaterally (Figure 1). Her Port-A-Cath insertion site was unremarkable.

Ecthyma gangrenosum was suspected. Blood cultures were sent, and fluid was aspirated from one of the leg lesions and sent for culture. The patient was started on intravenous cefepime and vancomycin empirically. She defervesce quickly and the lesion improved on the next day. Her blood culture remained negative, but wound culture grew *Pseudomonas aeruginosa* sensitive to ciprofloxacin. Her absolute neutrophil count recovered quickly and increased to  $3.81 \times 10^9$  /liter on the 3<sup>rd</sup> day of hospitalization. Antibiotic was changed to ciprofloxacin 750mg twice daily for three weeks. Approximately three weeks after discharge she received her third cycle of chemotherapy with growth factor support and prophylactic antibiotic with ciprofloxacin and had no further complications.



**Figure 1** Hemorrhagic Bulla with Erythematous Flare.

## DISCUSSION

Ecthyma gangrenosum is usually caused by *Pseudomonas aeruginosa* infection, but can also be caused by *Aeromonas hydrophila*, *Staphylococcus aureus*, *Serratia marcescens*, *Aspergillus* species, and *Mucor* species [1,2]. Ecthyma gangrenosum is usually seen in immunocompromised patients, such as those with hematologic malignancies, patients on immunosuppressive therapies after transplantation, diabetes mellitus, malnutrition, or intravenous drug users [2]. It has been commonly reported in children, and many of the affected patients were neutropenic [3]. The incidence is about 1.3% to 6% of patients with *Pseudomonas aeruginosa* bacteremia [1]. The typical skin findings often occur early and are frequently misdiagnosed, resulting in delayed treatment. Patients often are initially treated with antibiotics covering gram-positive bacteria.

The classic gunmetal grey bullae and ulcerations can occur anywhere, but most frequently appear in the gluteal or perineal region (57%), extremities (30%), trunk (6%) and face (6%) [3,4]. Treatment is usually a combination of an anti-pseudomonal beta-lactam antibiotic and an aminoglycoside for both bacteraemic and nonbacteraemic ecthyma gangrenosum. In addition, surgical debridement of dead tissues and eschars is often needed. The most important prognostic factor is the absolute neutrophil count. All patients reported to have died with *Pseudomonas aeruginosa* bacteremia had an absolute neutrophil counts of less than  $5 \times 10^8$ / liter [4]. We were unable to find a previously published report of ecthyma gangrenosum in otherwise healthy young female undergoing adjuvant chemotherapy for breast cancer. We present this first case to raise awareness of the possibility of such deadly infections in otherwise healthy patients, who have otherwise short periods of neutropenia (as in our patient), since early diagnosis and aggressive antibiotic treatment can be lifesaving in this potentially fatal disease.

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