Ecthyma Gangrenosum in Patients With Acquired Immunodeficiency Syndrome

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GOAL

To describe the reoccurrence of ecthyma gangrenosum (EG) in two patients with acquired immunodeficiency syndromes (AIDS).

OBJECTIVES

1. To describe the clinical characteristics of EG.
2. To discuss causative organism and risk factor for EG in patients with AIDS.
3. To identify rates of relapse/recurrence of EG in patients with AIDS.

CME Test on page 124

This article has been reviewed by Michael Fisher, MD, Professor of Dermatology, Albert Einstein College of Medicine, in July 2000.

Ecthyma gangrenosum, a necrotic skin lesion most often caused by Pseudomonas aeruginosa*, has been infrequently reported among patients with acquired immunodeficiency syndrome (AIDS). We report two cases of ecthyma gangrenosum due to* P. aeruginosa *in AIDS patients. These patients developed recurrent* P. aeruginosa *infection, even in the absence of neutropenia. The recurrence rate of* P. aeruginosa *infection among reported cases of ecthyma gangrenosum in AIDS patients is 57%. A high index of suspicion should be maintained for recurrent* Pseudomonas *infection among AIDS patients with ecthyma gangrenosum.*

Case Reports

Patient 1—A 31-year-old white homosexual male with human immunodeficiency virus (HIV) infection and a CD4 cell count of 11 cells/mm^3, was admitted to the hospital with complaints of intermittent diarrhea, fever, right-sided facial swelling, and erythema. On physical examination, the oral temperature was 101.2°F. A 2.5-cm × 3.0-cm area of erythema with central ulceration consistent with ecthyma gangrenosum (EG) was present over the right maxilla. The area was tender and warm to palpation. Right periorbital edema was present. The white blood cell count was 800 cells/mm^3. Skin biopsy of the facial ulcer demonstrated edema of the papillary dermis with few neutrophils. Gram stain showed numerous gram-negative bacilli, and cultures of the skin biopsy grew *Pseudomonas aeruginosa*. Following 3 weeks of intravenous ceftazidime and amikacin, the facial erythema resolved completely.

One year later, the patient was admitted to the hospital with a temperature of 102.6°F and chills. Physical examination was remarkable only for thrush. The white blood cell count was 1200 cells/mm^3 with 63% neutrophils. Blood cultures grew *P. aeruginosa* with the same antibiotic susceptibility profile as the isolate recovered from the EG lesion 1 year earlier. The patient was successfully treated with a 21-day course of antipseudomonal antimicrobials.

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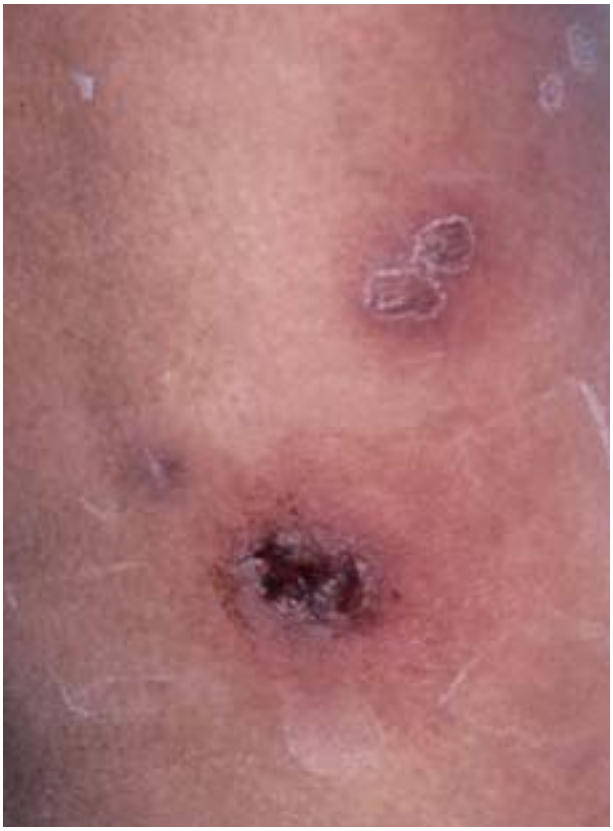

FIGURE 1. Ecthyma gangrenosum of the thigh presenting 6 weeks following a *P. aeruginosa* bloodstream infection.

Patient 2—A 45-year-old HIV-infected female with a CD4 cell count of 70 cells/mm^3 and squamous cell carcinoma of the head and neck was admitted for chemotherapy and radiation treatment. The hospital course was complicated by severe radiation-induced laryngitis, dysphagia, and a requirement for total parenteral nutrition. On hospital day 92, the patient developed a *P. aeruginosa* bloodstream infection that was treated with ceftazidime and ciprofloxacin. On hospital day 134, while receiving rehabilitation and hyperalimentation, the patient developed two painful skin lesions on her left thigh. Physical examination revealed a temperature of 98.6°F and an erythematous lesion with central necrosis consistent with EG. A second nodular lesion with surrounding induration and erythema was present 2 cm distal to the first (Figure 1). There was no palpable inguinal lymphadenopathy. The white blood cell count was 4100 cells/mm^3 with 84% neutrophils. Skin biopsy demonstrated diffuse dermal abscess formation with vascular proliferation, splaying of neutrophils, and epidermal spongiosis. No organisms were seen on Gram stain. Skin biopsy cultures grew *P. aeruginosa* with the same antimicrobial susceptibilities as the prior bloodstream isolate. Following 2 weeks of treatment with ceftazidime, the leg lesions healed completely.

Table I

AIDS Patients With EG Caused by *P. aeruginosa*

Reference Author	Patient Age (yrs)	Patient Sex	EG Site	Neutrophils/ mm^3	Initial sites With *P. aeruginosa*	Antibiotic Treatment	Time to *P. aeruginosa* Relapse, Site
Berger *et al*[4]	45	M	Buttock	800	Skin	Ceftazidime	3 months, buttock
Berger *et al*[4]	36	M	Penis	700	Skin	Ceftazidime	—
Sangeorzan *et al*[6]	35	M	Legs	Not stated	Skin, urine	Piperacillin, tobramycin	9 days, legs
Nelson *et al*[7]	22	M	Legs, scrotum	200	Skin	Ceftazidime, ciprofloxacin	—
El Baze *et al*[5]	28	F	Labia majora, chest, face	3000	Skin, sputum, urine	Antipseudomonal antimicrobials	—
Current Report	31	M	Face	<500	Skin, conjunctiva	Ceftazidime, amikacin	12 months, bloodstream

Discussion

EG is a rare, well-recognized skin manifestation of *P. aeruginosa* infection. The lesion consists of a round, indurated, ulcerated area with central necrotic black or gray-black eschar and surrounding erythema.[1] The lesion often evolves from a necrotic vesicle, but can evolve from a maculopapular eruption or nodular lesion.[2] EG can present secondary to *P. aeruginosa* bacteremia or as a primary skin infection without associated bacteremia.[3]

We report two AIDS patients with EG caused by *P. aeruginosa* that highlight the recurrent nature of *P. aeruginosa* infection in these patients and demonstrate that EG may occur in the absence of neutropenia. Although both patients had advanced immunodeficiency due to AIDS, only one patient (case 1) was neutropenic when EG developed. Neutropenia is a well-recognized risk factor for EG due to *P. aeruginosa* infection.[3-5] Of the five published cases of EG in patients with AIDS in which the white blood cell count was reported, only one patient was not neutropenic (Table I).[4-7] Our patient represents the second such case.

Recurrence or relapse of *P. aeruginosa* infection occurs in 23% to 39% of patients with advanced immunodeficiency due to AIDS.[8-11] Both of our patients had a recurrence of *P. aeruginosa* infection despite appropriate antipseudomonal treatment. In contrast to the two previously reported AIDS patients in whom EG was recurrent, our patients had recurrent *P. aeruginosa* infection at sites other than skin. One patient (case 1) had a bloodstream infection 1 year following EG, and the other patient (case 2) had EG present as the recurrent *P. aeruginosa* infection 6 weeks following a *P. aeruginosa* bacteremia. Including our patients, the recurrence rate of *P. aeruginosa* infection in AIDS patients with EG is 57% (four of seven patients). In contradistinction, reports of EG among immunosuppressed populations other than AIDS patients have not commonly reported recurrences of *Pseudomonas* infection.[3,5,12]

Although we are only aware of seven reported cases of AIDS patients with EG, our findings indicate that relapses or recurrences of *P. aeruginosa* infection occur in the majority of AIDS patients with EG. Relapse/recurrent *P. aeruginosa* infection may be limited to EG lesions or may occur at sites other than the skin either before or following EG. A high index of suspicion should be maintained for recurrent *P. aeruginosa* infection among AIDS patients with EG. Consideration should be given to an extended course of antipseudomonal treatment or possibly to preventing recurrent infection for these patients.

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FACULTY DISCLOSURE

The Faculty Disclosure Policy of the College of Medicine requires that faculty participating in a CME activity disclose to the audience any relationship with a pharmaceutical or equipment company that might pose a potential, apparent, or real conflict of interest with regard to their contribution to the program.

Dr. Khan, Dr. Montecalvo, Dr. Valhalla, and Dr. Wormser report no conflict of interest. Dr. Fisher reports no conflict of interest.