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Case Report

Case report of pyoderma gangrenosum in association with orthopaedic trauma

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ABSTRACT

Pyoderma gangrenosum (PG) is an uncommon neutrophilic dermatosis characterized by painful skin ulcers. It is associated with various systemic diseases but is rarely associated with orthopedic conditions. We report a case of a pyogenic gangrenosum in a 40-year-old male, that occurred in association with a lower limb fracture. This patient suffered a laceration over the ankle which was the sutured initially and the fracture was managed conservatively. Later on the wound was complicated with the development of pyoderma gangrenosum. Failure to treat with antibiotics and local wound management lead to alternative diagnosis by dermatologist. Patient was successfully managed by dermatologist and fracture was managed conservatively. Such incidents of PG in association with orthopedic procedures, complicate treatment and cause delay in recovery, leading to poor patient outcome.

Keywords: Pyoderma gangrenosum, Fracture, Wound complication, Orthopaedic complication

INTRODUCTION

PG is a non-infectious neutrophilic dermatosis with distinct clinical features manifesting as painful erythematous papules and pustules which rapidly progress to necrotic ulcers with undermined edges and voilaceous/ erythematous borders.[1] PG lesions demonstrate pathergy phenomenon, a hypersensitivity response triggered by minor trauma and is characterized by papule or pustule formation.[7] About 50% cases are found to be associated with systemic diseases like inflammatory bowel disease (IBD), rheumatoid arthritis or other seronegative spondylo arthropathies, haematological malignancies or monoclonal gammopathies (in particular immunoglobulin A gammopathy) and other malignancies.[8-10] It may be cutaneous reaction to various drugs as well as to trauma and surgery.[2] Some incidents of PG have been reported in orthopaedic surgery or injury.[6,11,12]

CASE REPORT

We report a case of 40-year-old female who fell down stairs suffering minimally displaced fracture of right lateral malleolus (Figure 1) and a laceration of anterior aspect of ankle. Initially the patient was managed with suturing of laceration and back slab was applied for fracture by orthopaedic doctor on call. Patient attended OPD on 10th day post fracture for review and a poorly healing wound with ulceration was observed over the sutured laceration. Wound infection was suspected and antibiotics were started. In spite of prolonged antibiotic course (with intra-venous cefuroxime and vancomycin), the wound was worsening and hence a debridement was done. The sample was sent for culture and sensitivity which showed no growth. This wound was not healing on serial follow ups and was expanding to involve surrounding tissue with the inflamed periphery (Figure 2).

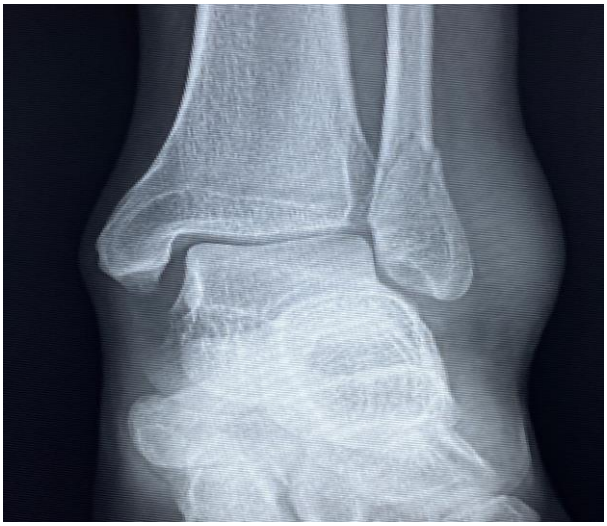

Figure 1: Undisplaced fracture lateral malleolus.

Consultations were done with surgery and dermatology department for alternative diagnosis. A skin biospy was obtained from the margins of the ulcers by the dermatology team which demonstrated pyoderma gangrenosum (Figure 3). The classic undermined borders and peripheral erythema in the ulcer helped the dermatologist confirm the diagnosis of pyoderma gangrenosum.

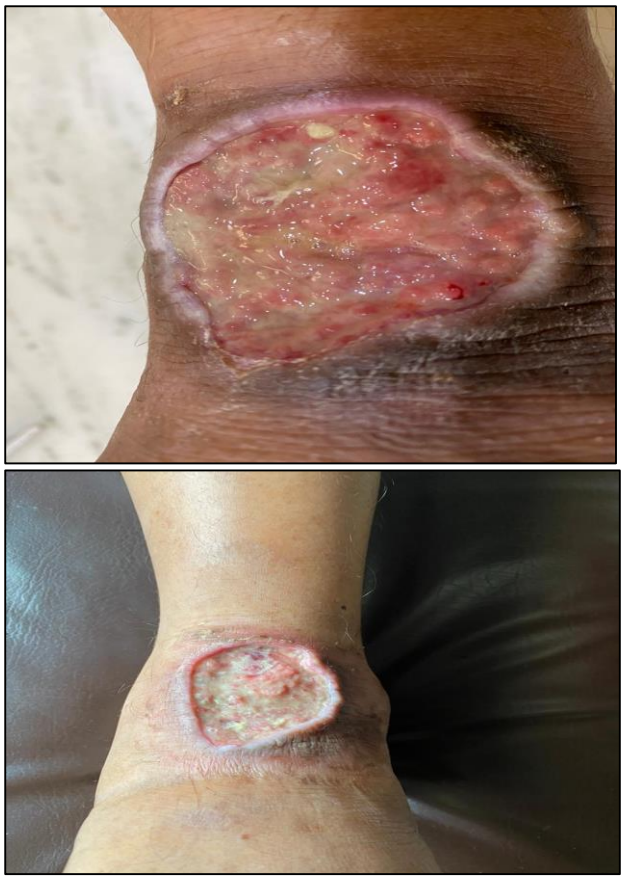

Figure 2: Ulcerative lesion with bluish margins and surrounding erythema.

Then patient was then managed with combination therapy of oral steroids and platelet rich plasma (PRP). Oral prednisolone (1 mg/kg per day) was given for initial 2 weeks followed by tapering of dose over a period of 6 weeks. The ulcers were also treated with autologous PRP prepared using double-centrifugation method. Ulcers responded to treatment and healed in 8-week period. Simultaneously, the fracture was managed conservatively by the orthopaedic team with a walking boot.

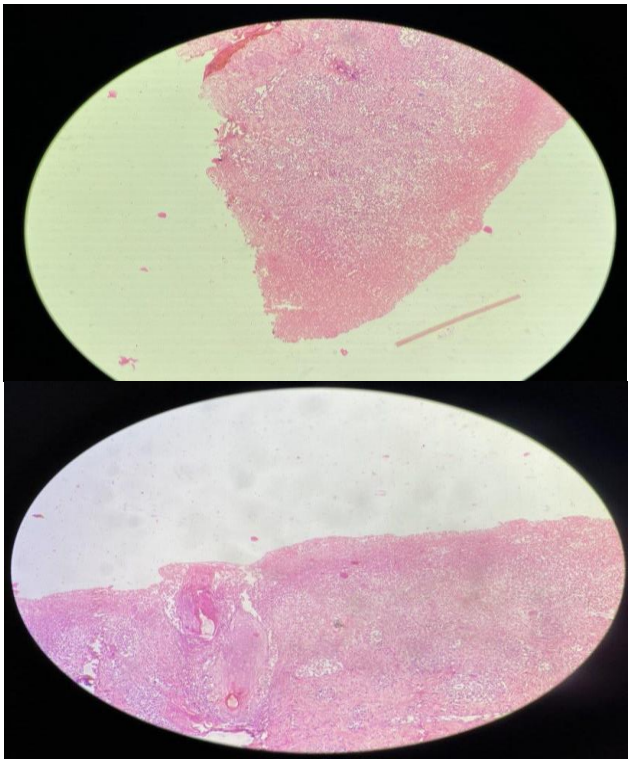

Figure 3: Histopathology showing intense neutrophilic folliculitis, intradermal abscess formation, epidermal necrosis and ulceration.

At patient's 6- month follow up visit, he showed complete healing of the wound with minimal scarring (Figure 4).

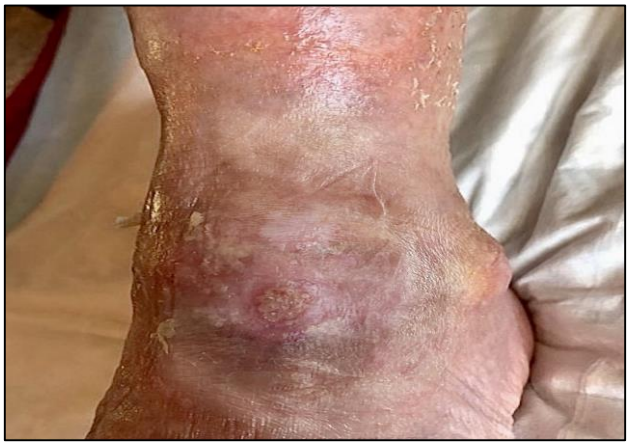

Figure 4: Wound healing with scarring on follow up.

DISCUSSION

Pyoderma gangrenosum is a non-infectoious inflammatory neutrophilic dermatosis, represented by papules and pustules that rapidly evolve into undermined necrotic ulcerations and may develop after surgery.[2,3] The literature has identified a number of clinical PG variations, including ulcerative, pustular, bullous, and vegetative.[2-4] Although it can develop everywhere, the ulcerative variety is frequently found on the legs and is linked to IBD and arthritis. As ulcerative PG progresses, pustules expand, necrose, and eventually form ulcers with an erythematous ring around them and a blue border. Pustular form is frequently linked to IBD and typically manifests on the limbs as isolated, superficial pustules that consolidate and ulcerate. Bullous type is characterized by painful vesicles that grow into bullae with a necrotic center and frequently occurs in conjunction with hematologic malignancies. On the trunk, the vegetative type often manifests as a superficial, single ulcer. Vegetative PG is expected to be less invasive and is typically unrelated to the systemic disease.[3]

The pathophysiology of PG is poorly understood; however, it is now presumed that multiple factors including loss of innate immune regulation, altered neutrophil chemotaxis, genetic susceptibility and inflammatory mediators are likely to contribute to its pathogenesis.[5] Clinical findings are the primary foundation for diagnosis. The correct diagnosis may be made with the use of a thorough prior medical history of PG or an underlying systemic ailment. The lack of a laboratory test to diagnose PG makes diagnosis difficult, and skin lesion biopsies show non-specific acute inflammatory alterations with a preponderance of neutrophils.[2,6]

Around 40% of PG cases occur following minor trauma.13 Post-traumatic PG may or may not be associated with underlying systemic disease. Finkel and Janowitz have described trauma as a possible precipitating factor in the development of PG in 5 patients with inflammatory bowel disease (i.e., ulcerative colitis and Crohn's disease).[14]

Post-surgical pyoderma gangrenosum is an infrequent but serious post-operative complication characterized by rapidly expanding ulcers at the surgical site. Orthopedic surgery contributes to 12% of post-surgical PG.[15]

The treatment of PG includes a combination of local wound care and systemic therapy. Mild cases are treated with topical or intralesional corticosteroids while moderate to severe cases require oral or intravenous sytemic therapy.[16,17] Sytemic treatment includes prednisolone, dapsone, cyclosporine and thalidomide.[16,18] Skin grafting can be done in many cases after stabilization of PG for better aesthetic results.

CONCLUSION

PG can resemble a wound infection. The presence of sterile tissue cultures, inflammatory lesions with poor response to antibiotic therapy, and the recurrence of an infection following wound debridement are all significantly predictive of the diagnosis.[6] Most patients respond to treatment when treated with a combination of oral/IV corticosteroids, and/or immunosuppressants such as cyclosporine or tacrolimus (systemic or topical) or a biological agent, such as infliximab with rapid improvement in systemic symptoms, halting of lesion expansion and gradual wound closure with cribriform scarring.[19] Wound debridement should be avoided in non-healing PG as it can trigger pathergy reaction.

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