CASE STUDIES

Recurrent and treatment-resistant pyoderma gangrenosum, secondary to hidden underlying breast cancer

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Abstract

Pyoderma gangrenosum (PG) is a rare ulcerative disorder of the skin associated with underlying diseases, such as rheumatoid arthritis, inflammatory bowel disease, and hematological malignancies. However, there have been very few reports of association of PG with solid organ malignancies. We report here the case of a 37-year-old lady with a chronic non-healing ulcer of the thigh, who repeatedly underwent multiple debridements, followed by two failed grafts, which was later diagnosed as PG. Initially, she failed to respond to oral steroids, but responded well with intravenous methylprednisolone pulse. However, she later presented with a breast mass with bone metastasis and recurrence of PG ulcer. Diagnosis and treatment of the underlying occult malignancy along with that of PG at an initial stage would have prevented the recurrence and avoided a serious consequence like metastasis. The case study underscores the association of PG with serious conditions, such as malignancy, and the necessity to conduct prompt and thorough analysis in such cases.

Keywords: Recurrent pyoderma gangrenosum, breast carcinoma, parenteral pulse steroids

Introduction

Pyoderma gangrenosum (PG) is an inflammatory disease, characterized by neutrophilic infiltration of the dermis.[1] The incidence is estimated to be prevalent in 3-10 patients per million population per year. Peak age of incidence is found to be between 20-50 years, with a slight female preponderance.[2] In about 50% of the patients, PG can be associated with underlying systemic diseases, such as rheumatoid arthritis, inflammatory bowel disease, and hematological malignancies.

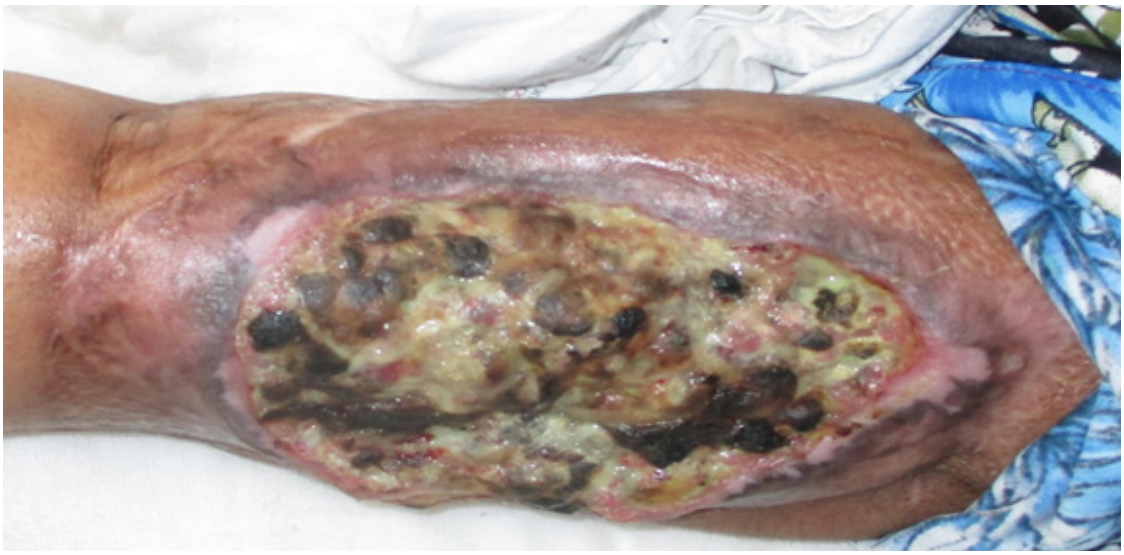
Case report

A 37-year-old female presented with a painful non-healing ulcer on her left thigh, which was insidious in onset and had been troubling her for the past two years. The patient had undergone multiple surgical debridements and two flap reconstructions, which failed within few days of the surgery. She did not have any clinical evidence of other associated systemic conditions at that point of time. Cutaneous examination revealed a solitary 15 cm x 8 cm ulcer with pale granulation tissue and necrotic slough on the floor, edge was indurate and undermined, border was violaceous with tenderness on palpation.

The patient's hemogram, urine and stool examinations, blood sugar levels, liver and renal functions and chest X-ray examinations were normal. Fungal culture, Tzanck smear, and staining for acid-fast bacilli were negative. Radiography of the underlying bone showed no evidence of osteomyelitis. Pus culture from the ulcer showed the presence of *E. coli* and *Pseudomonas aeruginosa*, but the wound did not heal, despite the use of appropriate antibiotic, surgical debridement and wound care. Biopsy showed neutrophilic infiltration into the upper dermis.

In line with the above observations, a diagnosis of PG was considered and the patient was started on oral prednisolone at a dose of 1 mg/kg/day as tapering dose over a month. However, the patient showed a poor response to oral steroids. Subsequently, she was started on a therapeutic trial of methylprednisolone injection, 1 gm

Fig. 1: Pyoderma gangrenosum at initial presentation



for five days, followed by oral steroids at a dose of 1 mg/kg/day with gradual tapering, along with methotrexate 15 mg/week for a month. The ulcer started healing, as seen by the appearance of healthy granulation tissue at the base and edges of the ulcer.

Despite the treatment, the patient presented with recurrence of ulcer after a few months, and repeated skin biopsies showed no pathology other than PG. Within a year of initial visit, she presented with a painful breast mass and pain in multiple bones in association with the recurrence of PG ulcer. A histopathological examination of the breast mass showed infiltrating ductal carcinoma, negative for estrogen and progesterone receptors, and positive for epidermal growth factor receptor (HER 2) with pathological stage T2N1Mx.

In view of the new developments, the patient underwent modified radical mastectomy with radiotherapy, and had been scheduled to receive chemotherapy for the metastasis

Fig. 2: Histopathological finding of pyoderma gangrenosum

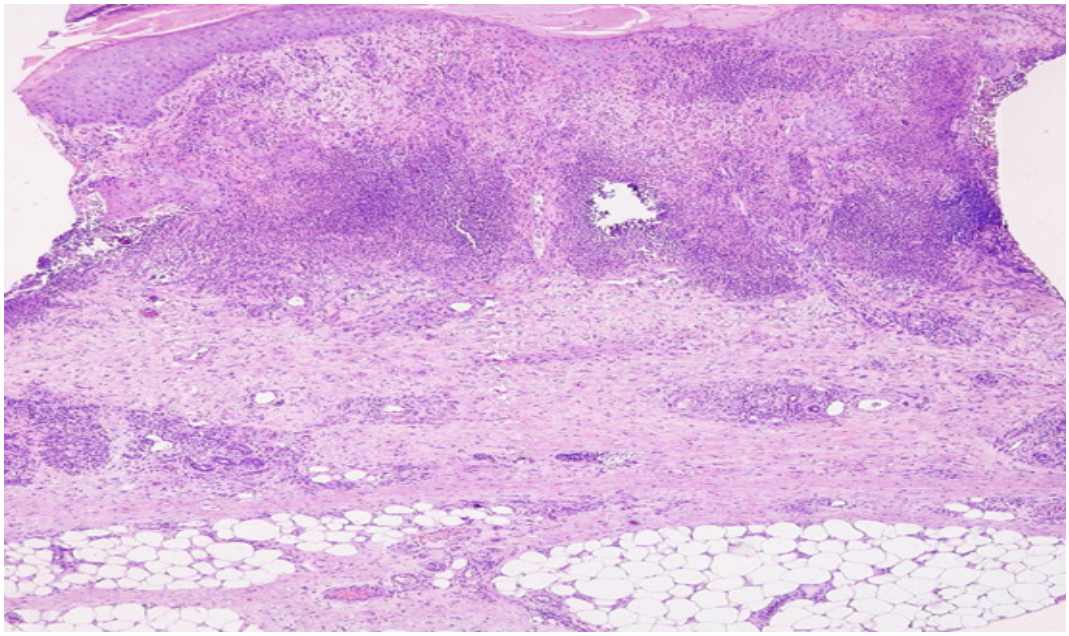


Fig. 3: PG ulcer showing healthy granulation of tissue in response to pulse steroid treatment

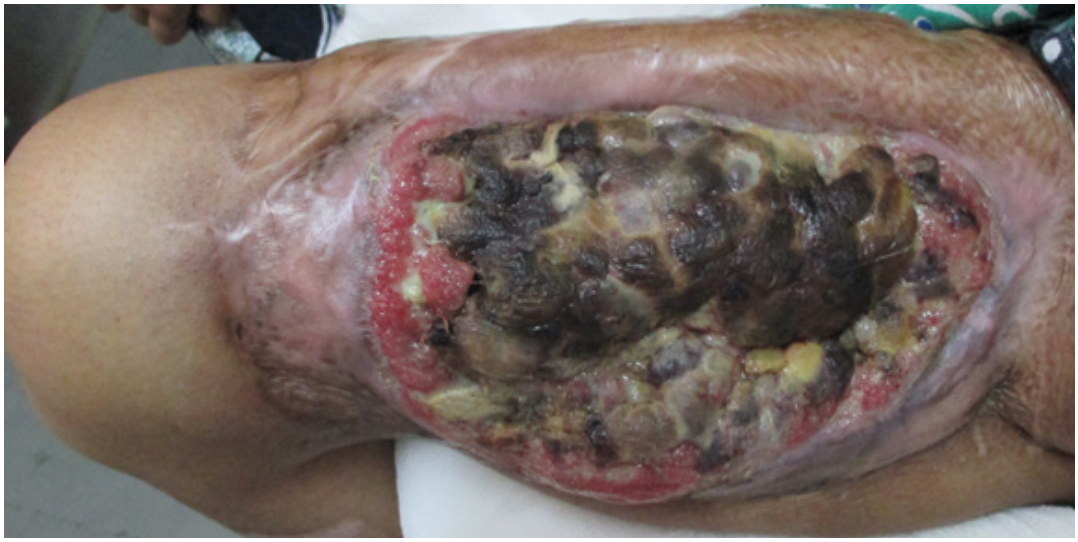
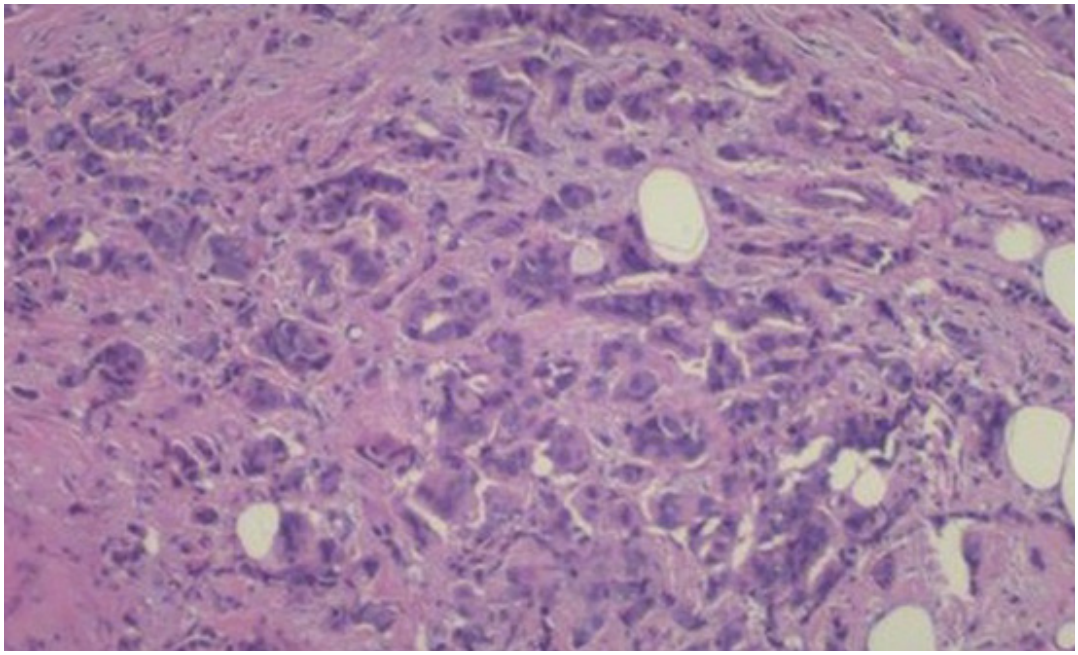


Fig. 4: Histopathological finding of infiltrating ductal carcinoma



at a later date due to her unfavorable socioeconomic reasons.

Discussion

PG is a neutrophilic dermatosis of unknown etiology.[3] Fifty percent of all PG cases are associated with systemic diseases such as the inflammatory bowel disease, arthritis, and hematological malignancies, whereas 25-50% are idiopathic.[3-6] In the present case, a diagnosis of PG was made according to the criteria proposed by Daniel Su *et al*. (Table 1).[7]

Only a few reports of PG associated with solid malignancies including breast cancer are available in literature.[8-12] In addition, a few cases of PG of the breast, precipitated by breast surgery have been reported.[12-14] The recommended first-line treatment is the use of steroids.[3] Other immunosuppressive drugs such as cyclosporine, azathioprine, mycophenolate mofetil, cyclophosphamide, chlorambucil and thalidomide have also been used successfully.[3, 15-17] Although there is not much literature on pulse therapy in PG, suprapharmacological doses of

Table 1: Criteria proposed by Daniel Su *et al.* for the diagnosis of PG

Major criteria	Minor criteria
Rapid progression of a painful, necrotic cutaneous ulcer with an irregular violaceous and undermined border	History suggestive of pathergy or clinical finding of cribriform scarring
Other causes of cutaneous ulceration	Systemic diseases associated with PG
	Histopathological findings: (sterile dermal neutrophilia +/- , mixed inflammation +/-, lymphocytic vasculitis
	Treatment response (rapid to systemic steroids)

methylprednisolone/dexamethasone have been used in resistant cases.[4, 18]

In the present case, recurrence of PG was plausibly induced by the occult breast malignancy, which was initially undetectable by clinical examination. The malignancy was incidentally diagnosed only after one year of the initial presentation. The interesting features of this case, besides its association with breast cancer, are the recurrence of the ulcer and the initial improvement with pulse methylprednisolone followed by resistance to treatment. All of these are the clues to suggest an atypical presentation of PG. Further work-up and a close follow-up is necessary in such atypical cases, along with a high suspicion of an underlying undiagnosed condition. The association of PG with life-threatening conditions, such as malignancy, necessitates a constant attempt to diagnose the malignancy at an initial stage, especially in cases showing recurrence and resistance to regular treatment with steroids.

Competing interests

The authors declare that they have no competing interests.

Citation

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