Case Report

A rare case of adult scalp pyoderma gangrenosum with cranial osteolysis

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ABSTRACT

Pyoderma gangrenosum (PG) is a rare and painful idiopathic skin condition that has one or more areas of chronic ulceration with well demarcated and undermined borders. Bone osteolysis (the pathological destruction of bone tissue) secondary to PG is a rare phenomenon with limited cases reported in children only.

This is the first case report of scalp PG with cranial osteolysis in an 80-year-old adult, with an initial presentation mimicking skin carcinoma. This case highlights the importance of a multidisciplinary team (MDT) meeting discussion, diagnosis of PG by exclusion and the successful treatment of this patient’s PG eroding to the bone.

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Case report

An 80-year-old Caucasian male presented to our services with painful scalp ulcerative lesions. The patient was a non-smoker with type-2 diabetes mellitus and hypertension. The patient sustained a traumatic, left parietal scalp wound 2 months prior to presentation. The traumatic scalp wound was managed with regular dressing by the public health nurse but healing was slow and the wound began to deteriorate (Figure 1). At presentation, the patient had also developed a new non-traumatic left frontal scalp ulcer. In the weeks prior to presentation both ulcers had become painful. The scalp lesions...
were eroding in nature with central ulceration and bleeding and according to the patient had gradually increased in size with associated bleeding of the ulcer. As a neoplastic lesion was suspected, the patient was admitted for oncology workup including radiological staging and punch biopsies for histological diagnosis.

Following multiple quadrant 4 mm punch biopsies (total of 8 were taken, 4 at each ulcer), results revealed inflammation and chronic ulceration of the tissue with no evidence of malignancy. A computed tomography (CT) of the brain revealed erosion of the outer table cortex only (Figure 2), at both left parietal and left frontal scalp lesions with normal brain parenchyma. After discussion of the case at the skin cancer MDT meeting it was decided to perform investigations for non-cancerous causes of scalp ulceration with input from dermatology and microbiology. Subsequent investigations (Table 1) were all negative and after careful consideration a clinical diagnosis of osteolytic PG of the scalp was made.

The patient commenced oral steroids; at post discharge he was followed up closely and his scalp ulcers slowly improved (Figure 3). His steroid regime involved oral prednisolone 40 mg daily for the
duration of 3 weeks followed by gradual tapering of dose by 5 mg per week, with the completion of the course at week 12. At one month after the commencement of steroids, his left frontal scalp ulcer had healed and healing of the left parietal scalp ulcer was progressing (Figure 1). The patient reported that pain from both ulcer sites had subsided after the ulcers had healed at 3 months (Figure 4). He had no complication from steroid therapy.

**Discussion**

Osteolytic PG of the scalp is an idiopathic cutaneous disorder. It is characterized by progressive painful ulceration, which causes local destruction of underlying structures. It is a benign lesion, which typically develops post trauma to the area. Histological examination of tissue biopsy shows non-specific inflammation with no malignancy features.\(^1\)

PG is a condition diagnosed by exclusion of other underlying systemic disease or inflammatory process that may contribute to the development of skin ulceration or necrosis.\(^2\)\(^{-5}\) Approximately 50% of patients
diagnosed with PG with skin ulceration or necrosis have an underlying systemic disease. The condition was first described over 85 years ago and an infectious etiology was suspected. Subsequent microbiological investigations failed to elicit any microbial growth to support this concept. Several treatments have been described in the literature for cases with known PG including the use of immune-suppressive treatment for a period of 3-6 months depending on response and regular follow-up. Surgical excision with split thickness skin-graft reconstruction has also been performed with variable results. PG is a condition where surgical resection may be detrimental due to increase in size of the affected area after resection and poor healing post-operatively. There is also a limited uptake of grafts over the affected area. Surgery has the added disadvantage of potentially initiating

### Table 1

| Test grouping | Test                             | Level                | Reference range        | Interpretation                                      |
|---------------|----------------------------------|----------------------|------------------------|-----------------------------------------------------|
| Hematological | U&E                              | (Within normal limits) | (Within normal limits)  | No diagnosis of micro/macralbuminuria diagnosis reached |
|               | Albumin/creatinine ratio         | <0.7                 | 0.0-2.5 mg/Mmol        |                                                     |
|               | Lactate dehydrogenase (LDH)      | 311                  | 208-378 IU/L           |                                                     |
|               | ESR                              | 11                   | 1-12 mm/h              |                                                     |
|               | FBC                              | (Within normal limits)| (Within normal limits) |                                                     |
|               | LFT’s                            | (Within normal limits)| (Within normal limits) |                                                     |
|               | Iron study                        | (Within normal limits)| (Within normal limits) |                                                     |
| Serology      | Rheumatoid arthritis factor (RF) | <12                  | 0-20                   | Unlikely rheumatoid arthritis diagnosis to be reached 90% of rheumatoid is RF positive. Connective tissue disorder unlikely to be diagnosed |
|               | Connective tissue disorder (CTD) screen – includes antibodies for DNA, RNP, SM, Ro, (52 & 60), La and other nuclear antigens | Negative | Within normal ranges | Connective tissue disorder unlikely to be diagnosed |
|               | Anti nuclear factor (ANF)         | Negative             | Within normal range    |                                                     |
|               | Myeloperoxidase antibody (MPO)    | 0.1                  | 0.0-3.5 IU/ml          | Unlikely vacuities diagnosis to be reached          |
|               | Proteinase 3 (PR 3)               | 1                    | 0-2 IU/ml              | Unlikely vascular damage detected                   |
|               | Serum protein electrophoresis (SPEP) | Borderline low | Within normal range | No diagnosis reached                                    |
|               | Immunoglobulin                   |                      |                        |                                                     |
|               | IgG                              | 5.8                  | 6-15 g/l               | No diagnosis reached – no contribution was made to any diagnosis to allergy-focused evaluation. ANCA is positive in 90% of patients with generalized Wegener’s granulomatosis or microscopic polyarteritis. Anti-phospholipid syndrome unlikely. |
|               | IgA                              | 1.61                 | 0.7-4 g/l              |                                                     |
|               | IgM                              | 0.33                 | 0.5-2.3 g/l            |                                                     |
|               | Anti neutrophil cytoplasm AB (ANCA) | Negative | Within normal range | ANCA is positive in 90% of patients with generalized Wegener’s granulomatosis or microscopic polyarteritis. Anti-phospholipid syndrome unlikely. |
| Microbiological | Anti cardiolipin (IgG)           | 2                    | 0-10 GPLU/ml           | Unlikely infective cause detected                   |
|               | Anti cardiolipin (IgM)            | 1                    | 0-10 MPLU/ml           |                                                     |
|               | Beta 2 glycoprotein IgG           | 3                    | 0-6 U/ml               |                                                     |
|               | Beta 2 glycoprotein               | 1                    | 0-6 U/ml               |                                                     |
| Endoscopy     | Blood culture                    | No growth            | Unlikely intra esophageal or intra-colonic cause detected |
|               | Culture swab                     | No growth            |                                                     |
|               | OGD                              | Nil findings on scope| Nil findings on scope |                                                     |
| Colonoscopy   |                                  |                      |                        |                                                     |
a second surgically-triggered PG at the donor site\textsuperscript{13,14} or at other sites (for example, the site where the split skin graft is harvested).

In the current case study, the patient made a significant recovery 1 month after initiation of steroid therapy with a total regression of the ulcers at 3 months; therefore, further treatment was not required. In this age group, it is prudent to consider preoperative steroid treatment if undergoing surgical treatment\textsuperscript{9,15,16} and discuss the potential of recurrence with the patient.

There are two unique features in this case. First, the appearance of the second non-traumatic ulcer (left frontal scalp ulcer) completely separate to the initial ulcer. In addition, it is the first case report of adult scalp osteolytic PG which has been successfully treated with oral steroids.\textsuperscript{17,18} The presentation and nature of the lesions created a high-level of suspicion of a malignant origin but effective MDT discussion and sufficient investigations allowed the correct diagnosis to be reached and a more appropriate management plan to be implemented. It is important to take a cautious approach to cancer-mimicking lesions such as those described and to consider that surgical intervention may not lead to the best outcome possible.

This case highlighted the importance of MDT meeting discussions, exclusion of malignancy and consideration of other causes of ulcerating scalp lesion such as PG.

In summary scalp PG with cranial osteolysis is a rare condition.\textsuperscript{19} This case demonstrates that, with an accurate diagnosis, unnecessary surgical procedures can be avoided and a course of oral steroids may provide a safe and effective alternative treatment.

**Conflict of interest**

None.

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