LESSON OF THE MONTH

Post-traumatic leg ulcer

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Case Report

A 57 year old white lady received a dog bite to the medial aspect of her left calf, for which she did not seek medical attention. Over the next two weeks an ulcer formed at the site, which enlarged to 5 cm diameter and had a green sloughy base and bluish edge, surrounding erythema, and an offensive odour. At this juncture she presented to the accident and emergency department, from which she was admitted to the plastic surgery unit of another hospital.

Previous medical history revealed a weakly seropositive polyarthritis for the previous two years, but at the time of her admission to hospital her arthritis was quiescent on diclofenac 50 mg twice daily. She was also taking Prempak C 0.625 mg once a day. History and physical examination were otherwise unremarkable. The working diagnosis was that of an infected ulcer secondary to a dog bite and therefore intravenous augmentin was started.

After one week of antibiotic treatment the ulcer required debriding and skin grafting, after which the patient was allowed to return home. However, the graft became erythematous and broke down (figure), necessitating her readmission to hospital two months after the operation, by which time she had also developed hepatosplenomegaly, but no additional signs or symptoms. She restarted intravenous antibiotics and blood tests were performed. Full blood count showed mild anaemia with severe leucopenia, lymphopenia,

and neutropenia (table). On the basis of her neutropenia, the patient was prescribed fluconazole 50 mg once daily, acyclovir 200 mg four times a day, and corsodyl mouthwash; her diclofenac was stopped on the advice of the haematologists. Bone marrow aspiration showed a reactive marrow with no signs of malignancy. Immunoglobulins were polyclonally increased, with no compact bands, and fluorescence activated cell sorter analysis of peripheral blood lymphocytes confirmed lymphopenia, but no abnormal cell populations. Inflammatory markers—erythrocyte sedimentation rate, C reactive protein, complements C3 and C3d, and urine neopterin—in addition to rheumatoid factor and antinuclear antibody (ANA) were all increased or positive (table). Double stranded DNA antibodies were negative, as was the lupus anticoagulant.

At this point the patient was referred to the clinical immunology unit, where a provisional diagnosis of pyoderma gangrenosum was considered. She was given four pulses of weekly intravenous methylprednisolone 1 g and was started on both a decreasing course of prednisolone, initially 40 mg weekly, and methotrexate increasing to 15 mg weekly. Her ulcer started to heal and both her haematology tests and inflammatory markers rapidly improved to normal, apart from a mild lymphopenia ($1.23 \times 10^9/l$). After six months, the ulcer had fully healed, and she has remained well with no additional signs or symptoms of systemic disease such as nodules or erosive changes on radiographs.

Discussion

Pyoderma gangrenosum is a skin condition of uncertain pathogenesis in which vesicopustules or erythematous nodules appear, most commonly on the legs, and undergo a rapid destructive, necrotising process to form large ulcers with bluish, undermined edges and surrounding erythema. In approximately 40% of patients, the lesion follows minor skin trauma, and in 75% of patients the ulcer is painful and tender.¹ The ulcer may heal either spontaneously or after treatment, to leave an atrophic cribriform scar. Histopathological examination commonly reveals sterile abscess formation, marked cell infiltration, thrombosis, haemorrhage, and necrosis.²

Although pyoderma gangrenosum may occur on its own, approximately 80% of the patients have associated systemic disease.³ The list of associated diseases is large, but includes gastrointestinal, hepatic, blood, and lung diseases, carcinomas, leukaemias, arthritides,

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Leg ulcer on the medial calf after breakdown of skin graft

Summary of results on readmission

Test	Result	Normal Range
Haemoglobin (g/l)	95	115–165
Platelets ($\times 10^9/l$)	188	150–400
Leucocyte count ($\times 10^9/l$)	0.84	4.0–11.0
Neutrophils ($\times 10^9/l$)	0.19	2.0–7.5
Lymphocytes ($\times 10^9/l$)	0.35	1.5–4.0
ESR (mm/1st h)	135	< 34*
C reactive protein (mg/h)	15	< 10
Complement C3 (g/l)	1.38	0.63–1.19
Complement C3d (U/ml)	20	5–12
Complement C4 (g/l)	0.306	0.11–0.43
ds-DNA antibody	Negative	
Rheumatoid factor titre	2560	
Antinuclear antibody (IgG) titre	3200	
Antinuclear antibody (IgM) titre	> 6400	
ANCA	Negative	
Anti-ENA	Negative	
Other autoantibodies	Negative	
Lupus anticoagulant	Negative	
Immunoglobulins	Polyclonally increased	
Peripheral lymphocyte markers	No abnormal lymphocyte populations	

*Normal range for this age and sex only.

ESR = Erythrocyte sedimentation rate; ANCA = antineutrophil cytoplasmic antibodies; ENA = extractable nuclear antigen.

vasculitides, and AIDS.⁴ It is also important to exclude local causes of leg ulceration, including trauma, infection, malignancy, neuropathy, venous or arterial insufficiency, thrombosis, emboli, and diabetes. In the present patient, no local factors other than trauma were relevant.

This lady fulfilled only three of the 11 criteria for systemic lupus erythematosus (SLE),⁵ and did not have Raynaud's phenomenon, alopecia, or livedo reticularis. However, SLE was believed to be the most likely diagnosis, and the pyoderma gangrenosum rapidly responded to treatment of the underlying disease. Other possible differential diagnoses included Sweet's syndrome, though this usually involves multiple pustules rather than a single lesion,⁶ and rheumatoid arthritis with a Felty's-like condition, though this is characterised by large granular lymphocytes which were not present in this patient.⁷

Systemic lupus erythematosus, including drug induced SLE,⁸ has previously been described as being associated with pyoderma gangrenosum.^{9–13} However, many of these cases have been associated with the presence of lupus anticoagulant,^{9–13} which was not detected in our patient. In those patients reported in whom pulsed steroid treatment was instituted, there was a rapid resolution of the ulcers.^{11–12}

Whatever the underlying cause, once underlying infection is excluded, high dose steroids are the usual mainstay of the treatment of pyoderma gangrenosum,¹⁴ along with appropriate treatment for the underlying disease. A variety of other treatments have also been used, with particular benefit being gained from salazopyrine.¹⁵ The prognosis is generally

good with treatment, emphasising the need for accurate diagnosis, though the prognosis of the underlying disease must be considered.

The patient described serves to demonstrate the importance of considering the diagnosis of pyoderma gangrenosum in any ulcer, especially when there is a history of trauma, albeit minor, or presence of systemic disease. Skin biopsying can be helpful in making the diagnosis, and infection should be excluded.⁴ Once the diagnosis is made, a careful search for underlying disease should be made and appropriate treatment instituted. In particular, aggressive debridement and skin grafting should be avoided in a condition which is often induced by trauma.¹⁶

The lesson

- Local presentations of systemic disease must always be considered.
- If pyoderma gangrenosum is suspected, a careful search for an underlying disease must be made and local surgery avoided.

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