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Improvement of refractory pyoderma gangrenosum with adjunctive maggot debridement therapy

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Dear Editor,

Pyoderma gangrenosum (PG), a painful non-infectious ulcerative autoinflammatory neutrophilic dermatosis, is notoriously challenging to manage. Patients with PG often have a high burden of morbidity due to delayed wound healing, scarring, and adverse effects from prolonged immunosuppressive treatment.[1] Although high-level evidence is limited, first-line therapy includes early topical and systemic immunosuppressive therapy with supportive wound care.[1] However, the efficacy of standard therapies was observed to be only 47% at 6 months, and recurrence occurred in 28–30% of healed lesions.[2] As pathergy is a feature of PG, surgical debridement is usually avoided due to the risk of disease worsening. In this article, we report a case of refractory PG in a patient with pemphigus vulgaris (PV) that improved with maggot debridement therapy (MDT).

A 65-year-old female presented with rapidly worsening ulcerative lesions on her left lower extremity that began as a cluster of small, dark red blisters following a flare of biopsy-proven PV, despite reported compliance to prednisone and topical corticosteroid. Symptoms of sharp pain and claudication were associated with her lesion. Physical examination revealed a red, denuded plaque with peripheral sloughed skin on her left lower extremity. Histological examination revealed nonspecific changes of slight spongiotic dermatitis with a sparse mixed inflammatory infiltrate and a background of stasis changes. Wound culture of her left ankle grew *Pseudomonas aeruginosa,* and antibiotics were given in concordance with sensitivities. A diagnosis of PG was established.

The patient had tried outpatient systemic prednisone dose (20–50 mg/day), mycophenolate mofetil (1,500 mg/twice daily), high-potency topical corticosteroids, and topical tacrolimus, but her unresponsiveness ultimately led to inpatient management with subsequent readmission. The ulceration on her leg now was larger and crusted with an undermined border and extensive necrotic tissue (Figure 1a). Despite increased mycophenolate mofetil dose (2000 mg/twice daily) and Solu-Medrol (40 mg/8 h), her PG still did not begin to heal.

After obtaining written informed consent from the patient, we performed MDT. After 72 consecutive hours, there was a substantial reduction in the amount of necrotic tissue present (Figure 1b). Two days later, a second session of MDT further reduced the necrotic debris (Figure 1c). The patient was discharged the following day on mycophenolate mofetil (2,000 mg/twice daily), prednisone (20 mg/daily), and topical tacrolimus (0.03%/twice daily).

After one month, the ulceration showed marked improvement with granulation tissue formation (Figure 2a), and she began a 14-month prednisone taper. Ten months after the procedure, her dose of mycophenolate mofetil was reduced (1,500 mg/twice daily). The wound progressively re-epithelialized with almost complete resolution after 11 months (Figure 2b). We did not observe any signs of recurrence.

MDT likely acted through its multiple effects on wound healing in this patient with refractory PG. Induction of potential pathergy was minimized by using MDT to avoid blunt trauma. The pathergy phenomenon in pyoderma gangrenosum may occur at much lower rates in adult cases than in pediatric cases, and its presence was found in approximately 62% and 16.3% of cases, respectively.[3,4] As maggots only consume

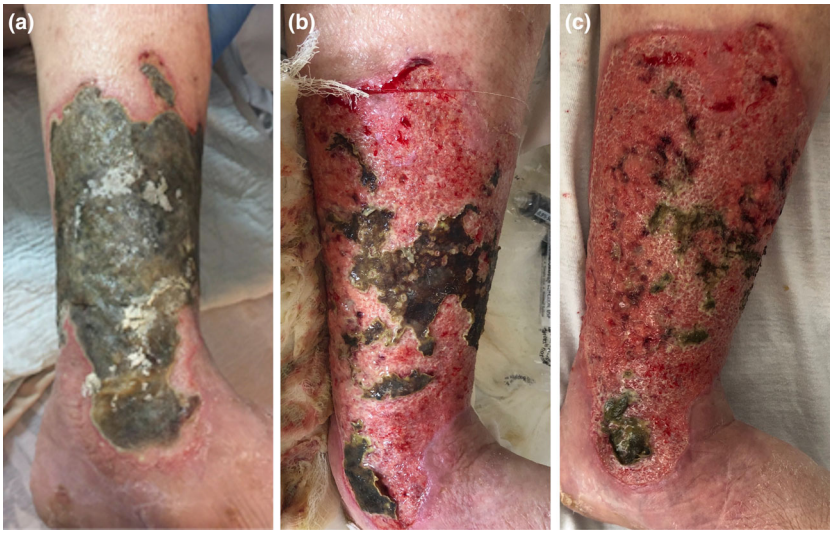

Figure 1 Clinical appearances before (a) and following the first (b) and second (c) maggot debridement biosurgery sessions

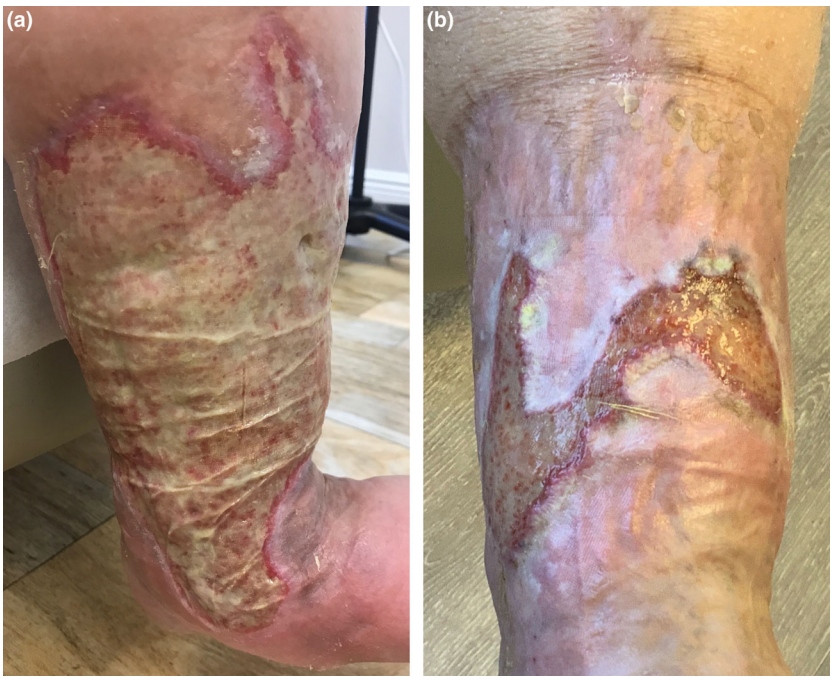

Figure 2 Progression of wound healing at 1-month (a) and 11-months (b) after maggot debridement biosurgery

necrotic tissue that is dissolved using specialized salivary enzymes, the risk of pathergy is minimal, and the healing potential of the wound is improved.[5] Granulation tissue growth is also promoted by maggot mechanical stimulation and excretions that contain calcium carbonate, urea, and allantoin.[5] While evidence is limited, maggot secretions may inhibit excessive inflammation and facilitate wound healing by downregulating C3a/C5a-mediated neutrophil activation.[6] While there is some data in other disease processes on the immunomodulatory contributions of maggot extracts through upregulation of Foxp3, further research is necessary to justify how maggots may stop the autoinflammation in PG.[7] Larger scale studies are warranted to further confirm the therapeutic efficacy of MDT in PG.

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