Two cases of maggot debridement therapy in pyoderma gangrenosum

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INTRODUCTION

Pyoderma gangrenosum (PG) is a neutrophilic dermatosis characterized by cutaneous ulceration. PG primarily affects young and middle-age adults with a preference for women and is often associated with an underlying systemic disease. Although its etiology is unclear, neutrophilic dysfunction, genetic risk factors, and chronic inflammation are thought to contribute to its pathogenesis. Patients with classic PG often present with a single or multiple ulcers commonly on the lower extremities or trunk. In addition to medical treatment, wound care to combat accumulation of necrotic tissue debris and biofilm formation is required for optimal management.

Wound debridement often presents a challenge in PG because of its feature of pathergy, or exacerbation in response to incidental or iatrogenic trauma, which has been reported in up to 31% of cases.[1] Maggot debridement therapy (MDT), a centuries-old tradition in medical history of placing larvae over a wound to digest necrotic tissue, has seen a recent resurgence in popularity.[2] The technology behind this technique has evolved with controlled therapeutic myiasis in which the live larvae are enclosed within a nylon mesh bag so they are obscured from view and cannot escape.[3] In this case series we review 2 cases of longstanding PG that were successfully debrided with MDT.

CASE 1

A 56-year-old woman with a longstanding history of PG presented for consideration of MDT. She first presented to an outside institution 6 years prior with an ulcer on the right lower leg after a spider bite. This ulcer was eventually diagnosed as PG and treated with prednisone, cyclosporine, and intravenous immunoglobulin.

Abbreviations used:

PG: pyoderma gangrenosum
MDT: maggot debridement therapy

Although these treatments improved her PG, the patient's resulting ulcer remained difficult to manage with discomfort, heavy drainage, and persistent foul odor. In the setting of poor wound management, the option for larval debridement with maggots was discussed. MDT was initiated with biocontained larvae. The ulcers were cleaned, and zinc oxide barrier cream was applied to the periwound skin after the larvae were allowed to migrate to the ulcer surface. She showed successful debridement with MDT and initial improvement in her PG (Figs 1 and 2).

CASE 2

A 35-year-old woman with a longstanding history of PG presented for a trial of wound debridement with MDT. She first had an ulceration of the left forearm 3 years prior subsequent to a metacarpal fracture requiring a forearm flap. The donor site wound on the forearm failed to heal for more than a year and was eventually diagnosed as PG. Treatment was recalcitrant to cyclosporine, dapsone, infliximab, and intravenous immunoglobulin. Eventually, her wound stabilized on prednisone, mycophenolate, intravenous immunoglobulin, and intermittent intralesional triamcinolone.

Her wound was initially managed with negative pressure wound therapy at 80 mm Hg. However, she reported significant pain with this, prompting a trial of MDT with biocontained larvae. In follow-up, she reported decreased pain and less production of

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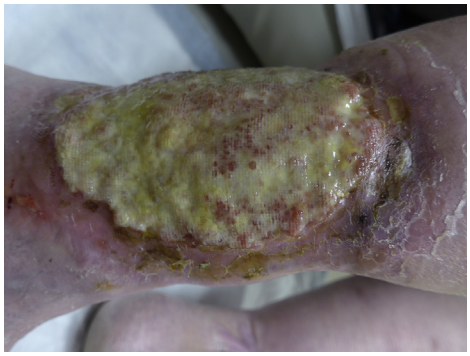

Fig 1. Before maggot debridement therapy.

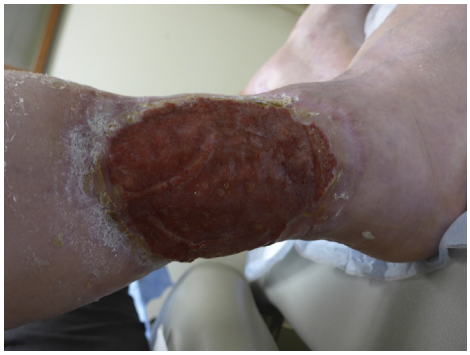

Fig 2. After maggot debridement therapy.

purulent exudate and malodor. Examination found complete debridement of necrotic tissue with improved erythema along the borders of the wound. Although closure of the wound has yet to occur for this patient, she continued with multiple rounds of MDT for debridement in her course of treatment.

DISCUSSION

MDT has evolved over centuries of use in the history of medicine. It has been widely implemented by physicians with positive results in the care of diabetic foot ulcers,[4] venous stasis ulcers,[5] and critical limb ischemia, even allowing for limb salvage.[6] A recent multicenter clinical trial conducted in France found that debridement with MDT compared with conventional scalpel debridement achieved results significantly faster with no difference in long-term outcomes.[7] Physicians using maggot therapy for off-label applications have reported positive results in re-epithelialization of non-healing wounds, disinfection, odor and drainage reduction, and debridement of acute burns, necrotic tumors, and ischemic ulcers, including unusual sites such as the glans penis, pleural space, and peritoneal cavity.[8]

Although MDT is not a substitute for traditional anti-inflammatory topical or systemic treatment for PG wounds and may not be adequate treatment for complex ulcers with superinfection, it shows considerable promise for debridement in chronic PG ulcers. The accumulation of necrotic debris, potential for infection, and biofilm formation currently require frequent sharp debridement and dressing changes that may be poorly tolerated by patients. In addition, creating new ulcers caused by pathergy is a major risk with sharp debridement. Chemical debridement with synthetic enzymatic compounds such as collagenase, papain, and bromelain have been reported and may lower the risk of pathergy relative to sharp debridement, but results for these have been variable.[9]

MDT may overcome these obstacles because of the enzymatic secretions of the larvae that have been found to disinfect wounds, reduce biofilm formation, regulate matrix metalloproteinases, and improve oxygenation.[10] Although others have reported difficulty with maggot viability in PG wound debridement,[11] our robust results suggest that with adequate wound preparation, reliable maggot source and packaging, appropriate application, and multiple rounds of therapy, complete debridement is readily attainable. Additionally, with biocontainment technology, the main barriers to use for MDT—reluctance of patients and discomfort of providers—are overcome by obscuring the maggots from view and containing them in the bag.

In this study, we reviewed 2 cases in which traditional wound care for PG ulcers was unsatisfactory for patients, prompting a trial of MDT. In both of these cases, patients with longstanding, painful, poorly healing ulcers experienced difficulty with traditional wound care that was ameliorated with the use of MDT.

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