Treatment of Leg Ulcers in a Patient With Vasculitis

This challenging situation features a 50-year-old male with bilateral lower extremity ulcers of traumatic origin and duration of approximately 4 months. The ulcers were believed to be secondary to multiple flea bites. He reported that 30 cats lived in his home with him. The patient’s history was negative, except for a history of alcohol abuse. Because he did not have a primary care provider, he sought help at an urgent care center for several months; treatment there consisted of oral antibiotics and weekly dry dressing changes.

This patient was admitted to the author’s hospital in December 2004 after several months of self-treatment. At that time the ulcers covered most of the left medial calf and half of the right anterior leg, as well as other smaller ulcers on all aspects of the lower legs (Figure 1). The ulcers were exquisitely painful, full thickness, and had clinical appearance of infection: friable, edematous wound beds, and marked periwound erythema. Appropriate antibiotics were instituted, along with local wound care. Although the infection resolved quickly, the wound bed tissue had an unusual appearance, and the inflammation only appeared to increase; a dermatologist was consulted. Sedimentation rate and other markers for inflammatory/autoimmune involvement were elevated. The patient’s ankle brachial index (ABI) was 1.27. A subsequent biopsy showed nonspecific inflammatory changes. Based on the laboratory results and the clinical appearance of the wounds, the wounds were characterized as vasculitic ulcers. The patient was started on 60 mg of prednisone daily, and the clinical appearance of inflammation was decreasing when, approximately 3 weeks later, he was transferred to a skilled nursing facility to continue the wound care regimen. Care continued there for the next few weeks.

The patient returned to the author’s outpatient wound setting for follow up in mid-January. He had completed his course of prednisone, and the ulcers were beginning to deteriorate (Figure 2). Although wound cultures showed colonization, there was no clinical indication of infection. However, the inflammation had flared up again, and the patient reported that the ulcers were extremely painful. Wound bed tissue again was friable, edematous, with marked periwound erythema. Both legs had moderate non-pitting edema mildly edematous to the knees, with multiple petechiae visible. All ulcers were full thickness; the 2 major wounds, one on each leg, were into muscle.

After many communication and scheduling problems, the patient was able to resume follow up with the dermatologist in March 2005 and was started on methotrexate 20 mg p.o. weekly. It took about a month for an apparent response, but by May 2005, obvious healing progress was visible and measurable. From that point on, healing became dramatic and the ulcers were nearly healed by mid-August.

Topical treatment varied according to status at each visit. Compression has been used consistently from initial treatment in the wound clinic; Unna’s boots were used for approximately 6 months, and then double-thickness elastic tubular support bandage (Tubigrip, Convatec, Skilman, NJ) were applied. Foams were the primary dressing because drainage was a major consideration especially early in treatment. When the patient displayed signs of colonization or infection, silver impregnated foams were used. Contreet (Coloplast, Marietta, Ga) proved the best choice for this patient; other products caused staining, making wound assessment difficult. Initially, dressing changes were required 3 times a week because of the excessive drainage. As inflammation and drainage decreased, frequency was reduced to twice a week then weekly.

Unfortunately, because of the financial problems, the patient ceased follow up with the dermatologist and his last weekly dose of methotrexate was in mid-July (Figure 3). In mid-August the ulcers began to deteriorate and as of the end
of September there were new ulcers visible, along with deterioration of the formerly almost healed ulcers.

Discussion
Although inflammation initiates the progressive “cascade of healing” in an acute wound, it is normally a brief phase which initiates an orderly healing process. When inflammation persists or resumes during a later phase of healing, however, the normal progression of healing is not allowed to occur. Wounds can become chronically “stuck” in the inflammatory phase with its accompanying pain, along with characteristically friable, hyper-granular, and edematous wound tissue.

Persistent inflammation may accompany such autoimmune conditions as rheumatoid arthritis, lupus, Crohn’s disease, scleroderma, pyoderma gangrenosum, and vasculitis. Although the exact pathology is unknown, circulating immune complexes are believed to be deposited on the walls of blood vessels, with leukocyte infiltration and release of enzymes, causing necrosis of the vessel and ultimately ulceration. Such inflammatory responses are also seen in patients without a history of prior or concurrent autoimmune disease, and though not common, they are not unusual. The patient must be treated systemically; otherwise wound healing will not occur.

High-dose oral steroids have been used with success in these situations, but with extensive wounds, the serious side effects of high-dose steroids preclude their use over long periods of time. More recently, methotrexate has become useful as a primary systemic treatment. In use for more than 30 years in the treatment of various malignancies, during the past 10 years, methotrexate has become the primary second-line treatment for rheumatoid arthritis. More recently, this drug has been used with great success in wound healing. Transient gastrointestinal upset and stomatitis may be experienced, but it is generally better tolerated with fewer side effects than is extended use of prednisone.

The action of methotrexate in wound healing may be succinctly explained: adenosine receptors on cells are involved in suppression of inflammation, and absence of adenosine increases inflammatory injury. Methotrexate is an adenosine agonist and increases the availability of adenosine for the regulation of the inflammatory response.

Local wound care had been appropriate throughout the course of the patient’s treatment, but systemic treatment of the inflammatory condition was necessary for healing to begin. Without systemic treatment, the wounds were completely recalcitrant to topical wound modalities; with systemic treatment, the wounds exhibited progressive healing in a dramatic fashion.

This case study is a good example of something we all know: healing will occur when the conditions are optimal. Our contributions are in the identification of the causative and contributing factors involved and in our manipulation of the various factors to create that optimal environment.

References

Commentary by Jane Fellows
Although these patients present with different lesions, they demonstrate the importance of accurate assessment, with particular emphasis on a patient’s medical history. In both of these case studies, the lesions were a result of an inflammatory process associated with an underlying disease.

As the first author reported, pyoderma gangrenosum is a complex problem and requires an individualized care plan. The patient she describes responded well to systemic corticosteroids. This is an effective treatment modality for pyoderma; however, there are patients for whom this therapy is contraindicated. The underlying inflammatory diseases that seem to predispose patients to pyoderma are often treated with steroids, and adverse effects may have occurred. Patients who have experienced the side effects of bone loss, weight gain, gastrointestinal disturbances, or edema are unlikely to want to have systemic corticosteroids prescribed for pyoderma. Other systemic treatment considerations include infliximab, methotrexate, and cyclosporine, but these drugs also have an extensive side-effect profile. Those patients with comorbid conditions, such as diabetes, renal insufficiency, and cardiac dis-