Necrobiosis Lipoidica With Superimposed Pyoderma Vegetans

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PRACTICE **POINTS**

- Necrobiosis lipoidica (NL), a chronic granulomatous disease characterized by collagen degeneration, granulomatous formation, and endothelial-wall thickening, is most often seen in association with insulin-dependent diabetes mellitus (DM).
- Asymptomatic, well-circumscribed, violaceous papules and nodules coalesce into plaques on the lower extremities, face, or trunk in NL.
- Treatment mainstay is topical and intralesional corticosteroids at active borders of lesions. Other treatments used with some success include tumor necrosis factor α inhibitors, topical tretinoin, topical tacrolimus, and skin grafting. Control and management of DM can be helpful.

Necrobiosis lipoidica (NL) is a granulomatous inflammatory skin disease strongly associated with diabetes mellitus (DM). Red-brown papules expanding into plaques with erythematous indurated borders on the lower extremities are characteristic of NL. Diagnosis is made clinically; however, biopsy of lesions confirms the diagnosis. Untreated NL may ulcerate and lead to further complications, but progression to superimposed pyoderma vegetans (PV) is not a known occurrence.

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Case Report

A 26-year-old woman with a medical history of newly diagnosed diabetes mellitus (DM), obesity, and asthma was evaluated as a hospital consultation with a vegetative plaque on the left lateral ankle of 13 months' duration. The lesion first appeared as a red scaly rash that became purulent. The lesion had been treated with multiple rounds of topical antibiotics, oral antibiotics, topical antifungals, and corticosteroids without resolution. The patient denied pain or any decrease in ankle mobility. Review of systems was otherwise negative.

On physical examination, 3 large, pink, scaly, crusted plaques with surrounding erythema were observed (Figure 1A). On palpation, purulent drainage with a foul odor was noted in the area underlying the lesion. Initial punch biopsy demonstrated epidermal hyperplasia with neutrophil-rich sinus tracts consistent with pyoderma vegetans (PV)(Figure 2A). Tissue culture was positive for *Staphylococcus aureus* and *Streptococcus anginosus.* Cultures for both fungi and acid-fast bacilli were negative for growth.

The patient was treated with mupirocin ointment 2% and 3 months of cephalexin 250 mg twice daily, which cleared the purulent crust; however, serous drainage, ulceration, and erythema persisted. The patient needed an extended course of antibiotics, which had not been previously administered to clear the purulence. During this treatment regimen, the patient's DM remained uncontrolled.

A second deeper punch biopsy revealed a layered granulomatous infiltrate with sclerosis throughout the dermis most consistent with necrobiosis lipoidica (NL)(Figure 2B). Direct immunofluorescence biopsy was negative. Once the PV was clear, betamethasone dipropionate ointment 0.05% was initiated to address the residual lesions (Figure 1B).

Physical examination combined with histopathologic findings and staphylococcal- and streptococcal-positive tissue cultures supported a diagnosis of NL with superimposed PV.

Comment

Necrobiosis lipoidica is a chronic granulomatous disease characterized by collagen degeneration, granulomatous formation, and endothelial wall thickening.[1] The condition is most commonly seen in association with insulin-dependent DM, though it also has been described in other inflammatory conditions. A case of NL in monozygotic twins has been reported, suggesting a genetic component in nondiabetic patients with NL.[2] Necrobiosis lipoidica affects females more often than males.

The pathogenesis of NL is not well understood but likely involves secondary microangiopathy because of glycoprotein deposition in vessel walls, leading to vascular thickening. Histopathology reveals palisading and necrobiotic granulomas comprising large confluent areas of necrobiosis throughout the dermis, giving a layered appearance.[3]

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The authors report no conflict of interest.

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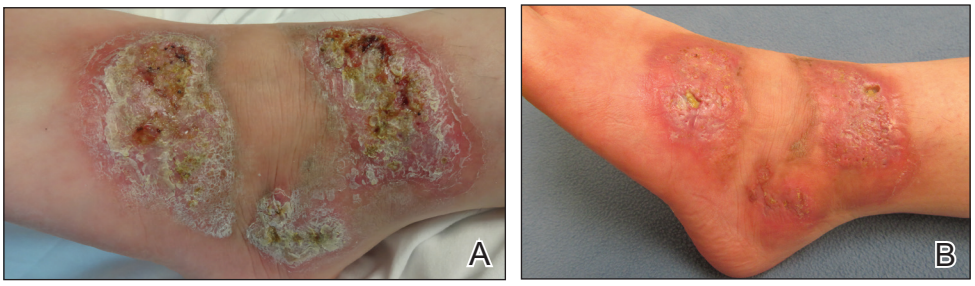

FIGURE 1. A, Initial presentation with 3 large, pink, scaly, crusted plaques with surrounding erythema. B, Residual pink shiny plaques with areas of yellow fibrinous discharge.

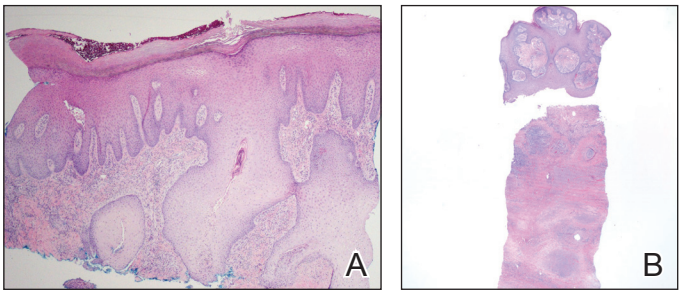

FIGURE 2. A, First punch biopsy of purulent crusted lesion on the left foot revealed epidermal hyperplasia with neutrophil-rich sinus tracts (H&E, original magnification ×4). B, Second deeper punch biopsy of a crusted lesion on the left foot revealed a layered granulomatous infiltrate with sclerosis throughout the dermis (H&E, original magnification ×2).

Clinically, NL presents with asymptomatic, well-circumscribed, violaceous papules and nodules that coalesce into plaques on the lower extremities, face, or trunk. The plaques have a central red-brown hue that progressively becomes more yellow and atrophic. The lesions can become eroded and ulcerated if left untreated.[1]

Clinical diagnosis of NL can be challenging due to the similar clinical findings of other granulomatous lesions, such as granuloma annulare and cutaneous sarcoidosis. As reported by Pellicano and colleagues,[4] dermoscopy has proved to be an excellent tool for differentiating these granulomatous skin lesions. Necrobiosis lipoidica demonstrates elongated serpentine telangiectases overlying a white structureless background, whereas granuloma annulare reveals orange-red structureless peripheral borders.[5]

Treatment of NL is difficult; patients often are refractory. Tight control of blood glucose alone has not been proven to cure NL. The mainstay of treatment is topical and intralesional corticosteroids at the active borders of the lesions. Tumor necrosis factor α inhibitors have shown some success, though recurrence has been reported.[6] Other treatments, such as topical tretinoin and topical tacrolimus, may be of some benefit for atrophic NL lesions. Studies also have shown that skin grafting can be of surgical benefit in ulcerative NL with a low rate of recurrence.[6] Control and management of DM plus lifestyle modifications may play a role in decreasing the severity of NL.[7] Topical psoralen plus UVA light therapy and other experimental treatments, such as antiplatelet medications,[8] also have been utilized.

The case of NL presented here was complicated by a superimposed suppurative infection consistent with PV, a rare chronic bacterial infection of the skin that presents with vegetative plaques. Pyoderma vegetans is most commonly observed in patients with underlying immunosuppression, likely secondary to DM in this case. Pyoderma vegetans is most often caused by *S aureus* and β-hemolytic streptococci. The clinical presentation of PV reveals verrucous vegetative plaques with pustules and abscesses. The borders of the lesions may be elevated and have a granulomatous appearance, thus complicating clinical diagnosis. There often is foul-smelling, purulent discharge within the plaques.[9]

Histopathology reveals pseudoepitheliomatous hyperplasia with abscesses and sinus tracts. An acute or chronic granulomatous inflammatory infiltrate may be observed. Basophilic funguslike granules are not seen within specimens of PV, which helps differentiate the disease from botryomycosis.[10]

There is no standardized treatment of PV; topical and systemic antibiotics are mainstays.[10] One reported case of PV responded well to acitretin.[9] Our patient responded well to 3 months of oral antibiotic therapy, followed by topical corticosteroids.

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