

Necrobiosis Lipoidica Associated With Köbner's Phenomenon in a Patient With Diabetes

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Necrobiosis lipoidica (NL) is a granulomatous disease that usually presents on the lower extremities of patients with diabetes mellitus. We present a rare case of NL köbnerizing in a surgical scar on the upper extremity of a patient with diabetes. NL is generally refractory to treatment.

Köbner's phenomenon, which denotes the appearance of isomorphic lesions occurring at sites of trauma in uninvolved skin, has been described with several cutaneous diseases including psoriasis, vitiligo, lichen planus, and necrobiosis lipoidica (NL).¹ NL is an uncommon skin manifestation strongly associated with underlying diabetes mellitus. We describe an unusual case of NL that köbnerized in a surgical scar on the upper extremity. To our knowledge, this phenomenon has only been reported in association with NL in 6 patients (Table 1).^{2,7} Only 2 of these patients^{2,3} had an occurrence in a site other than the lower extremities, the most common area of involvement in NL.⁸

Case Report

A 58-year-old female with a 15-year history of non-insulin-dependent diabetes mellitus presented to our clinic for evaluation of a rash on her left forearm. The patient had developed this eruption 2 years prior to presentation, shortly after undergoing a triple coronary artery bypass graft with harvesting of the left radial artery and the left saphenous vein. The rash had been asymptomatic for the patient but

seemed to have progressed during the previous month. She had tried both over-the-counter topical antifungal cream and hydrocortisone cream without success. The patient's past medical history was significant for coronary artery disease, hypertension, and congestive heart failure. Her surgical history included an abdominal hysterectomy in 1974. She denied any previous history of skin diseases. Her medications included enalapril, furosemide, glipizide, metformin, aspirin, and digoxin.

Physical examination revealed coalescing violaceous plaques with an indurated border surrounding the surgical scar on her left medial forearm (Figure 1, A and B). No other skin lesions were noted around the scars on her abdomen and left leg. A comprehensive metabolic panel was within normal limits, except for an elevated serum glucose level of 183 mg/dL (normal range, 70–110 mg/dL) and a glycosylated hemoglobin level of 11.4% (normal range, 5.5%–7.8%). Cutaneous biopsy showed necrobiosis of collagen with surrounding palisaded granulomas consistent with NL (Figure 2, A and B).

The patient was initially placed on topical clobetasol propionate for 2 weeks without success. She then underwent a trial of oral pentoxifylline (1200 mg/d) before being lost to follow-up.

Comment

NL is a granulomatous disease associated with diabetes mellitus and abnormal glucose tolerance with a female-to-male ratio⁸ of 3:1. The average age of presentation is 30 years in patients with diabetes. The most common site of involvement is the legs (85%), although NL has been reported to occur on the hands, forearms, face, and scalp.⁸ Typical lesions occur as irregular plaques with a yellow atrophic center and violaceous indurated

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Table 1.

Köbner's Phenomenon in Patients With Necrobiosis Lipoidica*

Case Report	Age, y	Gender	Diabetes	Anatomic Site	Surgery
Sahl ²	28	F	Y	abdomen	cholecystectomy and appendectomy
Miller ³	30	F	Y	abdomen	cholecystectomy
Llajam ⁴	35	M	Y	legs, dorsum, feet, popliteal fossa	none (burn scars)
Schumacher et al ⁵	52	F	N	legs	osteosynthesis
Gebauer et al ⁶	59	M	Y	left leg	saphenous vein harvesting
Vion et al ⁷	30	F	N	legs	phlebectomies
Ghate et al	58	F	Y	left forearm	radial artery harvesting

*F indicates female; M, male.

border. Ulceration may develop and can be associated with trauma.

Histopathology reveals epithelioid histiocytes palisaded around foci of degenerated collagen bundles involving the reticular dermis and often extending to the subcutaneous fat. A lymphoplasmacytic infiltrate is generally present around the vessels and is arranged in tiers following the vascular plexuses.⁹

The etiology and pathogenesis of NL remains unknown. The localization of NL to the lower

extremities suggests that trauma may be an etiologic factor. Immunoglobulins, complement, and fibrinogen have been shown to be present in vessel walls, suggesting an immunological mechanism.¹⁰ Local trauma and inflammation may trigger immune complex deposition with complement aggregation. Scarring also may produce vascular changes and chronic inflammation. Diabetic capillaropathy and collagen abnormalities such as overhydration also may be contributing factors.¹¹



FIGURE 1. Erythematous annular plaques with central atrophy and a violaceous indurated border surrounding surgical scar on the left medial forearm (A and B).

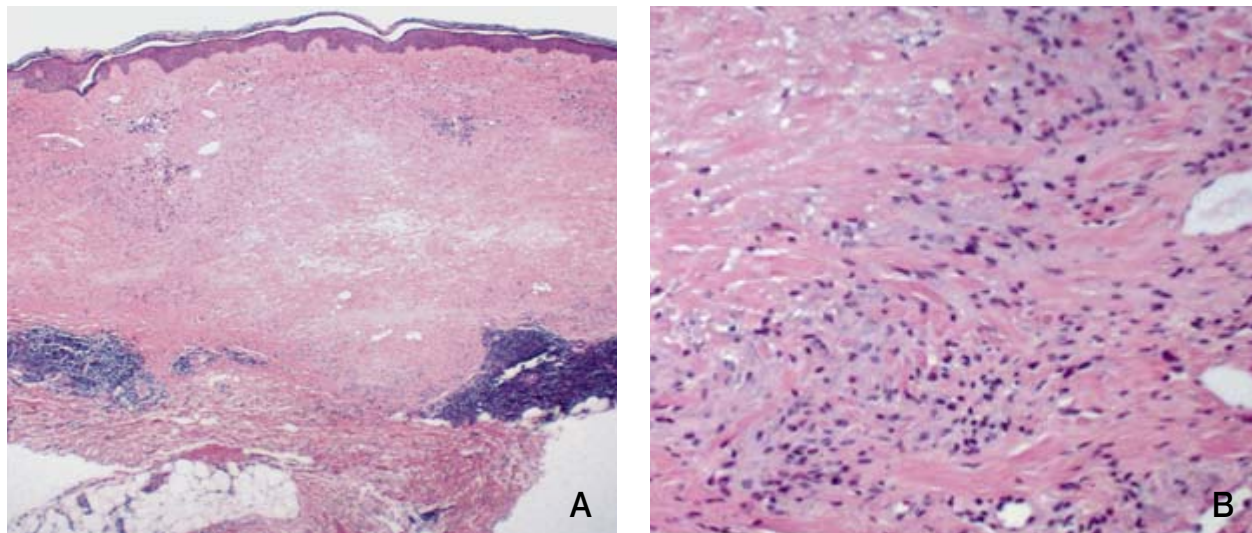


FIGURE 2. Below a thinned epidermis are zones of degenerated collagen with surrounding palisaded granulomas and numerous plasma cells and lymphocytes (A and B)(H&E, original magnification $\times 20$ and $\times 100$).

NL often may be refractory to multiple treatments. Studies have shown that well-controlled glucose levels do not necessarily correspond to improvement of skin disease.¹² Therapeutic options include potent topical corticosteroids, intralesional corticosteroids to the active borders, fibrinolytics such as pentoxifylline, and antiplatelet agents such as aspirin and dipyridamole. Surgical excision and skin grafting may be successful in patients who fail to respond to conservative ulcer treatment.

We present only the seventh case of the Köbner's phenomenon occurring in association with NL. Although 2 patients have been described with NL köbnerizing in scars on the abdomen, none have had involvement of an upper extremity. In addition, it is interesting to note that our patient, who had saphenous vein grafting of the lower extremity at the same time her radial artery was harvested from her forearm, had no evidence of NL on her legs.

REFERENCES

1. Miller RA. The Koebner phenomenon. *Int J Dermatol.* 1982;21:192-197.
2. Sahl WJ. Necrobiosis lipoidica diabetorum: localization in surgical scars. *J Cut Pathol.* 1978;5:249-253.
3. Miller RA. Koebner phenomenon in a diabetic with necrobiosis lipoidica diabetorum. *Int J Dermatol.* 1990;29:52-53.
4. Llajam MA. Koebner's phenomenon and necrobiosis lipoidica diabetorum. *Br J Clin Pract.* 1990;44:765.
5. Schumacher F, Schnyder UW. Necrobiosis lipoidica and Köebner-Phänomen. *Hautarzt.* 1991;42:587-588.
6. Gebauer K, Armstrong M. Koebner phenomenon with necrobiosis lipoidica diabetorum. *Int J Dermatol.* 1993;32:895-896.
7. Vion B, Burri G, Ramelet A. Necrobiosis lipoidica and silicotic granulomas on Muller's phlebectomy scars. *Dermatol.* 1997;194:55-58.
8. Lowitt MH, Dover JS. Necrobiosis lipoidica. *J Am Acad Dermatol.* 1991;25:735-748.
9. Ackerman AB. *Histologic Diagnosis of Inflammatory Skin Diseases: An Algorithmic Method Based on Pattern Analysis.* Baltimore, Md: Williams & Wilkins; 1997:561-569.
10. Ullman S, Dahl MV. Necrobiosis lipoidica: an immunofluorescence study. *Arch Dermatol.* 1977;113:1671-1673.
11. Eaton RP. The collagen hydration hypothesis: a new paradigm for the secondary complications of diabetes mellitus. *J Chronic Dis.* 1986;39:763-766.
12. Muller SA, Winkelmann RK. Necrobiosis lipoidica diabetorum. A clinical and pathological investigation of 171 cases. *Arch Dermatol.* 1966;93:272-281.