Dermatology Practical & Conceptual

Cutaneous Squamous Cell Carcinoma Developing in Necrobiosis Lipoidica - A Case Report with Literature Review

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Introduction

Necrobiosis lipoidica (NL) is a rare granulomatous condition affecting 0.3–1.2% of diabetic patients, with ulceration (most often due to trauma) occurring in about one third of NL cases [1]. We present a rare case of a young patient with inoperable squamous cell carcinoma in the NL region.

Case Presentation

A 33-year-old patient with type I diabetes mellitus presented with an enlarging tumor on the pretibial area of the right lower leg, initially diagnosed as pseudocarcinomatous hyperplasia. Over six years, the lesion progressed despite chemotherapy, ultimately measuring 15 x 20 x 6 cm. (Figure 1). Histopathology confirmed squamous cell carcinoma (SCC) grade 1. Concurrent yellow atrophic plaques with erosions and hyperpigmented borders were present bilaterally. According to the patient, skin changes on both lower legs had appeared three years before the subsequent development of a rapidly growing tumor on the right lower leg. Skin biopsy confirmed underlying NL. Imaging revealed soft tissue thickening without bone invasion. Due to the extent and tumor progression, low thigh amputation was performed. One year later, cytology of a palpable right inguinal lymph node indicated SCC metastasis (Figure 2). Lymph node dissection revealed granulomatous inflammation without malignancy, and immunohistochemistry was negative for epithelial markers. The patient is under routine surveillance, and topical corticosteroids have reduced disease activity in NL plaque.

Figure 1. Squamous cell carcinoma on right lower leg and necrobiosis lipoidica plaques on both lower legs.

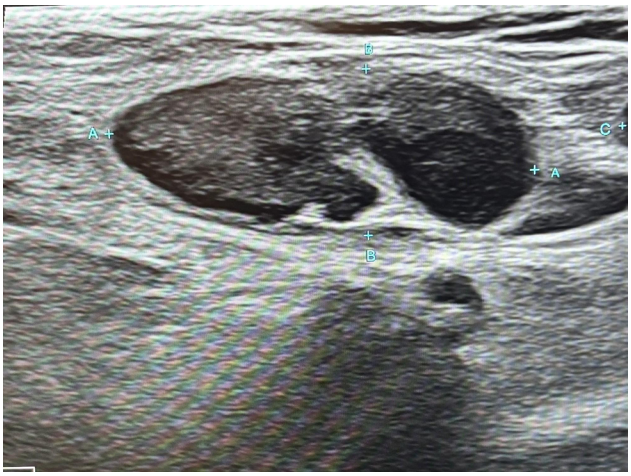

Figure 2. Echographic presentation of enlarged lymph node of right inguinal region.

Table 1. Review of the literature.

	Age and sex	Diabetes mellitus	Duration of NL (years)	Localisation	Metastasis or recurrence	Treatment	Reference
1	57, F	no	32	leg	unknown	unknown	Muller *et al.*, 1966
2	59, F	type I	36	right leg	regional lymph nodes	amputation and radiotherapy	Clement *et al.*, 1985
3	39, M	no	20	bilateral pretibial	no	skin graft	Kossard *et al.*,1987
4	69, F	no	40	bilateral pretibial	regional lymph nodes	bilateral amputation	Beljaards *et al.*, 1990
5	46, F	type I	11	left lower leg	no	skin graft	Porneuf *et al.*, 1991
6	52, M	type II	6	right leg	no	skin graft and radiotherapy	Pavithran, 1998
7	46, F	type I	29	left leg	no	skin graft	Gudi *et al.*, 2000
8	28, F	type I	12	left leg	no	skin graft	Imtiaz, 2001
9	76, F	no	30	right leg	no	amputation	Santos-Juanes *et al.*, 2004
10	33, M	type I	18	right leg	disseminated	radiotherapy	Vanhooteghem *et al.*, 2005
11	40, F	type I	12	left lower leg	no	skin graft	Mcintosh *et al.*, 2005
12	53, F	type I	25	right leg	no	skin graft	Lim *et al.*, 2006
13	68, M	type II	18	left lower leg	regional lymph nodes	amputation	Uva L. *et al.*, 2013
14	45, F	type I	6	left lower leg	recurrence	skin graft	Kolovics J., 2015
15	56, M	type I	10	right lower leg	regional lymph nodes	amputation, letal	Lefkovits *et al.* 2019
16	62, F	type II	10	right lower leg	no	skin graft	Souza MEV *et al.*, 2020
17	77, F	unknown	9	left lower leg	no	skin graft	McBriar *et al.*, 2020
18	72, F	no	unknown	bilateral pretibial	no	fibula transplantation and flap	Bota *et al.*, 2023

Only 18 cases of SCC arising in NL have been reported to date, with metastasis in five and one fatality (Table 1). Malignant transformation in NL ulcerations is attributed to chronic inflammation, tissue hypoxia from microangiopathy, reduced UV protection due to melanin loss, and repeated trauma to atrophic skin [1,2]. SCC in NL typically (in 39%) emerges 20–25 years after initial plaque onset, but in this case, tumor development occurred within three years. Most

documented cases involved middle-aged patients; our patient is among the youngest reported. Poor prognostic indicators in our patient included lesion diameter >2 cm, invasion of subcutaneous tissue, and rapid progression. A meta-analysis by Zakhem and colleagues showed that the involvement of subcutaneous fat tissue is the most important factor for squamous cell carcinoma recurrence and fatal outcome [3].

Surgical excision remains the primary treatment, with skin grafting employed when possible. Immunotherapy with PD-1 inhibitors (cemiplimab) is indicated for advanced or inoperable SCC [4]. In our case, systemic therapy was considered but not pursued due to the absence of confirmed metastases.

Evidence for effective monotherapy for NL is limited. Topical corticosteroids have been the first-line treatment for active and enlarging lesions for decades, but a systemic review by Nihal *et al.* suggests that topical corticosteroids are minimally effective as monotherapy, with less than half of cases (46%) showing improvement [5]. Compression therapy may offer additional benefits [5]. There is no consensus on surveillance or biopsy timing for ulcerated NL, underscoring the need for clinical guidelines. Gudi *et al.* recommend biopsy from multiple sites around the ulceration to increase the chances of detecting malignancy [6].

Conclusion

Persistent ulceration within NL plaques should prompt biopsy to exclude SCC, as malignant transformation, though rare, can progress rapidly with metastatic potential.

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