CASE REPORT

Necrobiosis lipoidica in an adolescent girl: A case report.

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ABSTRACT

Necrobiosis lipoidica (NL) is an unusual chronic disease of unknown cause. It affects more women than men, and it has been related to diabetes mellitus, although it can occur in people without this pathology. It manifests as atrophic plaques, with an active border, asymptomatic, generally located in the pretibial region. The diagnosis is clinical, and its treatment is very varied with few favorable results. We describe the case of an adolescent girl with diabetes mellitus treated with excimer laser.

INTRODUCTION

Necrobiosis lipoidica (NL) is a rare, chronic, granulomatous disease of unknown etiology.[1] A high percentage of patients with NL present diabetes mellitus (DM), being more frequent type 1.[2] It affects mostly females with a 3:1 ratio over males.[1,3]

Its pathogenesis has not been fully elucidated to date, although it is thought that microangiopathic mechanisms may be involved, with collagen alterations and inflammatory components.[1,4] They classically affect the pretibial region, manifesting as atrophic plaques of yellow-brown color, with an active border, generally asymptomatic.[5]

The diagnosis is clinical, however, its confirmation is made by histopathology, and its treatment is a real therapeutic challenge, in which topical corticosteroids are taken into account as the first line of choice, despite the lack of an established scheme.[6,7]

CLINICAL CASE

The case is presented of a 12-year-old adolescent girl with a history of type 1 diabetes mellitus, who came for dermatological consultation because she presented a shiny, slightly pruritic plaque of approximately 6 cm x 4 cm in diameter (photo 1), with signs of atrophy, with an active border, well defined, violaceous coloration, slightly infiltrated, of approximately 4 weeks of evolution, located on the anterior aspect of the middle third of the left leg, which progressively increased in size, with centrifugal growth. Dermoscopy (photo 2) showed erythematous areas, with presence of teleangiectasias, and areas without whitish structures and yellow-brown areas. Therefore, the diagnostic possibilities were: necrobiosis lipoidica vs. granuloma annulare.

A skin biopsy was performed, whose histological findings were focused on the dermis, (photo 3 and 4) without changes in the epidermis; presenting a mononuclear infiltrate composed of lymphocytes, histiocytes and

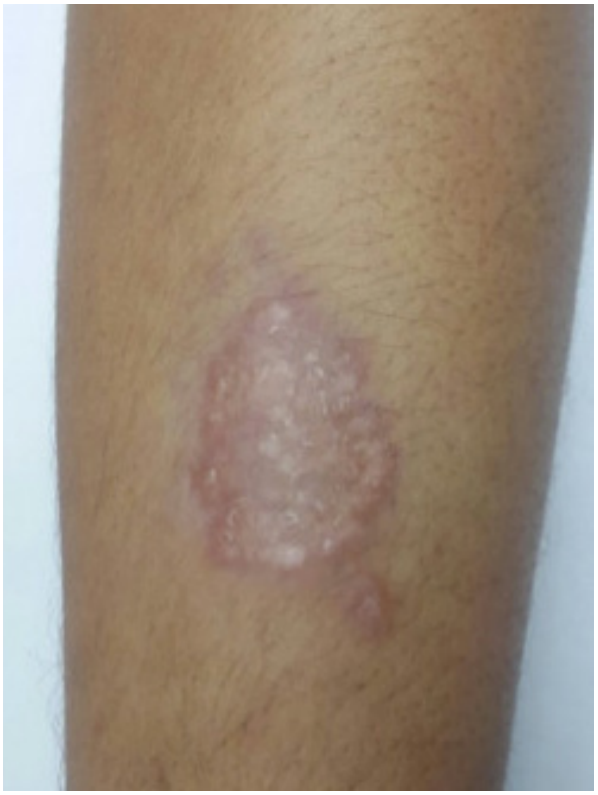

Photo 1: Violaceous erythematous plaque, shiny, with atrophic center, located on the anterior aspect of the left leg.

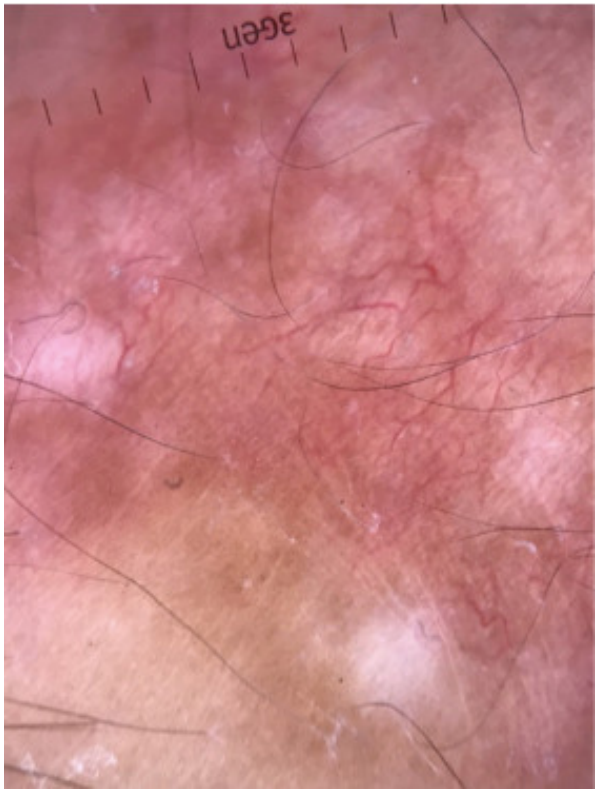

Photo 2: Dermoscopic image of the lesion, showing erythematous areas with teleangiectasias and areas without atrophic structures.

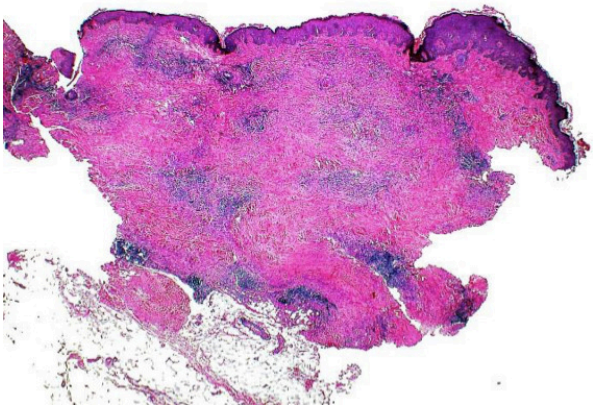

Photo 3: Histopathology: epidermis without significant alterations. Dermis: mononuclear infiltrate reaching the hypodermis.

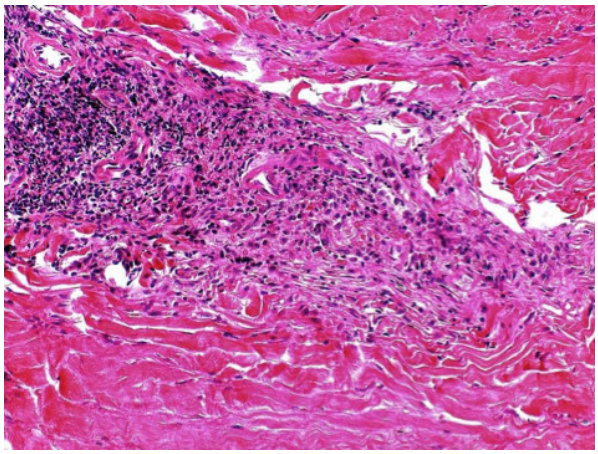

Photo 4: Dermis: mononuclear infiltrate composed of lymphocytes, histiocytes and plasma cells arranged in subsequent layers that reach the hypodermis. In addition, extensive areas of "necrobiosis" with collagen degeneration associated with interstitial macrophage infiltrate.

plasma cells arranged in subsequent layers that reach the hypodermis. In addition, there are extensive areas of collagen degeneration associated with interstitial macrophage infiltrate.

Based on the clinical and histopathological data, a diagnosis of necrobiosis lipoidica was made, and topical therapy with clobetasol twice a day for 3 weeks was started, and a cycle of 4 sessions of excimer laser was initiated, which resulted in partial improvement of the lesion.

DISCUSSION

NL is a rare, non-infectious, chronic, granulomatous inflammatory disease of idiopathic origin.[3,5,8]

It was first described in 1929 by Oppenheim, calling it diabetic dermatitis atrophicans lipoides. Later, in 1932, Urbach described another case also in a patient with diabetes and called it diabetic necrobiosis lipoidica.[1,2,4]

It has been considered a cutaneous marker of DM although it is not a pathognomonic sign, and it is also a marker of cardiovascular risk in this group of patients.[2,9,10] It affects 0.3% to 1.6% of patients with DM.[2,6,10] Up to 90% of patients with LN have a concomitant diagnosis of DM or will have it in the future, it is much more frequent in type 1 diabetes, although the incidence of LN in patients with diabetes is 0.3 to 1.2%.[1,2,3,11] In 62%, NL precedes the diagnosis of diabetes, in 24% it occurs simultaneously and in 14% it appears after the diagnosis of DM.[3,4,5,9]

It is three times more frequent in women, at an average age of 30 to 40 years, less frequent in children and adolescents.[5,8,12,13]

Its pathogenesis is not well elucidated, it is proposed that it could be due to a vasculitis secondary to immunocomplex deposition, or collagen abnormalities, although it is also considered the possibility that it is due to thickening of the basement membrane of the capillary walls that would lead to microangiopathic changes, with subsequent alteration in neutrophil chemotaxis, and a decrease in their ability to adhere to the vascular walls.[2,8,14,15] The finding of Glut 1 in the areas of sclerosis suggests a possible abnormality in glucose transport by fibroblasts.[10,14,15] However, there are also reports of increased blood flow in some lesions of LN, suggesting an inflammatory etiology.[3,11,14]

Clinically it manifests as papules that coalesce and form shiny, well demarcated plaques that grow eccentrically, with an atrophic center, erythematous-violaceous to brownish coloration that later evolve to a yellow-brown color, with an active border that may be raised or indurated.[1,2,8,11] Teleangiectasia may be observed due to thinning of the epidermis.[1,2,4,16] In some cases follicular punctation is present, which would correspond to transfollicular elimination of degenerated collagen, and which clinically confers a mottled appearance to the lesions.[2,4,16]

They are typically located in the pretibial region bilaterally in up to 85% of cases, although cases have also been reported affecting the face, scalp, trunk, groin, upper extremities or on post-surgical scars.[1,4,5,16]

They are generally asymptomatic, but pruritus, pain, anhidrosis, partial alopecia may be associated.[4,16] Ulceration may occur in 30% of cases, which is very often induced by trauma.[5,16] There are reports of evolution to squamous cell carcinoma.[9,15,17]

The following clinical forms are described:[2]

1. Classic form: it affects the pretibial region, manifesting as erythematous, yellowish plaques with an active border and a slightly atrophic center.
2. Actinic facial form: also called O'Brien's elastolytic granuloma annulare elastolyticum, it presents as smooth-surfaced, pink papules that extend to form an annular plaque of variable diameter, with a discrete central depression or hypopigmentation.
3. Nodulo-ulcerative form: similar to panniculitis lesions, they are located outside the legs (face, scalp, fingers, penis, nipples, post-surgical scars), may present as papules, nodules, morphea-like plaques, ulcerated or ulcerating lesions and perforating lesions.ulcerative or ulceronecrotic lesions and perforating lesions. They are frequently associated with systemic systemic diseases such as inflammatory bowel disease, sarcoidosis, rheumatic, infectious

and hematologic diseases.

4. Granuloma annulare type: it usually presents on the legs as small asymptomatic papules that are arranged in an annular shape, and that on histology are observed as palisade granulomas.
5. Angiodermatitis type: characterized by infiltrated plaques or nodules, located in the anterior part of the legs.

The diagnosis is clinical, although sometimes a skin biopsy is necessary to confirm it, and DM or impaired glucose tolerance should be investigated.[1,4,13]

Histopathology shows palisade and interstitial granulomas involving the dermis and subcutaneous cellular tissue.[4,7] In the dermis, degenerated collagen is observed, surrounded by histiocytes, lymphocytes, plasma cells and eosinophils.[4,18] Very frequently atrophy of the epidermis is observed. In direct immunofluorescence, IgM and C3 deposits are detected in the vascular walls, and IgM, C3 and fibrinogen in the dermal-epidermal junction.[16,19]

Differential diagnoses may include granuloma annulare, sarcoidosis, necrobiotic xanthogranuloma, lichen sclerosus, and erythema indurated.[4,16,18,20]

Its treatment represents a challenge, and its prognosis is variable, since so far there are multiple therapeutic options available, but with minimal and inconsistent results, and so far no standardized therapeutic scheme has been described, but its management is based on anecdotal evidence and case reports with variable results.[4,5,20] Among these, the first line therapy is considered to be the early use of topical corticosteroids to slow the progression of the lesions; although the use of intralesional corticosteroids in the active border has also been described as a good alternative. Other measures to consider is the control of the glycemic index, although it continues to be controversial.[1,5,8,12,16,20]

In addition, other therapies have been described, which are summarized in Table 1, including: systemic corticosteroids, PUVA, photodynamic therapy, topical calcineurin inhibitors, nicotinamide, hydroxychloroquine, mycophenolate mofetil, cyclosporine, clofazimine, dipyridamole, acetylsalicylic acid, pentoxifylline, thalidomide, cryotherapy, hyperbaric oxygen therapy, However, since it is an infrequent entity, not enough cases have been found for the elaboration of a clinical trial to protocolize its management.[1,5,8,16,20,21,19] (table 1)

Table 1: Treatment of necrobiosis lipoidica.

TOPICAL THERAPY	SYSTEMIC THERAPY
Topical corticosteroids	Pentoxifylline
Calcineurin Inhibitors	Systemic corticosteroids
	Doxycycline
	Cyclosporine A
OTHER THERAPIES	Thalidomide
CO2 Laser	Nicotinamide
Photodynamic therapy	Mycophenolate mofetil
phototherapy	Hydroxychloroquine
Surgical excision	Biologicals
Platelet-rich plasma	Intravenous
Hyperbaric oxygen	immunoglobulin

CONCLUSION

The report of this case ratifies what is stated in the world literature, which indicates that NL is a rare entity, related to DM, more frequent in women, which occurs very rarely in pediatric patients; however, it should be considered as a diagnostic possibility in children and adolescents who present pretibial skin lesions compatible with shiny, atrophic plaques with an active border, especially in patients with a history of DM. In our case, treatment with topical corticosteroids and excimer laser obtained a partial improvement of the lesions presented.

REFERENCES

1. Ortiz-Olivares AM, Guerra-Guerra T, Ruiz-Camejo N, Pérez-Armas R, Tapasco-Hernández WA. Necrobiosis lipoidica: Unusual presentation. Dermatologia Rev Mex. 2021;65(5):613-7.
2. Hernández-Collazo AA, López-Guzmán MJ, Hernández-Arana S, Briseño-Rodríguez G, Poletti-Vázquez ED. Necrobiosis lipoidica in children: a

10-year retrospective study. Dermatologia Rev Mex. 2015;59(6):504-9.
3. Hammer E, Lilienthal E, Hofer SE, Schulz S, Bollow E, Holl RW. Risk factors for necrobiosis lipoidica in Type 1 diabetes mellitus. Diabet Med. 2017;34(1):86-92.
4. Álvarez Aldana D, Tapia Milián Y, Duarte Vilariño A, Rodríguez Bebert Y. Necrobiosis lipoidica in a prediabetic patient. Rev Cuba Endocrinol. 2016;27(1):69-75.
5. Feily A, Mehraban S. Treatment modalities of necrobiosis lipoidica: A concise systematic review. Dermatology Reports. 2015;7(2):20-4.
6. Burns E, Ukoha U, Chan A. Necrobiosis lipoidica with rapid response to doxycycline. Pediatr Dermatol. 2020;37(5):981-2.
7. Bernia E, Llombart B, Bancalari B, Diago A, Serra-Guillén C. Conventional Photodynamic Therapy for Necrobiosis Lipoidica: Successful Treatment in a Series of 4 Cases. Actas Dermosifiliogr [Internet]. 2020;111(7):605-8.
8. Wee E, Kelly R. Pentoxifylline: An effective therapy for necrobiosis lipoidica. Australas J Dermatol. 2017;58(1):65-8.
9. Mc George S, Walton S. Necrobiosis lipoidica. Br J Diabetes Vasc Dis. 2016;16(1):6-9.
10. Absil G, Collins P, El Hayderi L, Nikkels AF. Necrobiosis Lipoidica following Breast Reduction. Plast Reconstr Surg - Glob Open. 2021;1-3.
11. Alhameedy MM. Necrobiosis Lipoidica: Atypical Presentation in a Diabetic Girl. Case Rep Dermatol. 2021;13(3):547-52.
12. Mitre V, Wang C, Hunt R. Necrobiosis lipoidica. J Pediatr [Internet]. 2016;179:272-272.e1. Available from: http://dx.doi.org/10.1016/j.jpeds.2016.08.080
13. Severson KJ, Patel MH, Brumfiel CM, Breen I, Butterfield RJ, Nelson SA, et al. Comorbidities and diabetic complications in patients with necrobiosis lipoidica. J Am Acad Dermatol. 2022;86(4):891-4.
14. Franklin C, Stoffels-Weindorf M, Hillen U, Dissemond J. Ulcerated necrobiosis lipoidica as a rare cause for chronic leg ulcers: case report series of ten patients. Int Wound J. 2015;12(5):548-54.
15. Berman HS, Shabihkhani M, Hogeling M. Pediatric necrobiosis lipoidica: Case report and review of the literature. Dermatol Online J. 2021;27(7).
16. Tong, Lana X Penn, Lauren Meehan SA. Necrobiosis lipoidica. Dermatology Online. 2018;24(2):1-4.
17. Xie CB, Ring N, Damsky W, McNiff JM, Olino K, Odell I. Squamous cell carcinoma arising in long-standing necrobiosis lipoidica treated with radical resection and split-thickness skin graft. JAAD Case Reports [Internet]. 2022;19:90-3.
18. Campos I, Simoneti F, Caputo G, Lacaz E, Criado PR, Filho CM, et al. Sarcoidosis with necrobiosis-lipoid-like skin lesions: A challenge for the dermatologist. Heal Sci Reports. 2021;4(1):2-5.
19. Abdat R, Cohen SR, Deverapalli S, Hoot J, Yang FC. Use of fractionated microneedle radiofrequency for necrobiosis lipoidica. Lasers Med Sci. 2021;36(6):1337-9.
20. Kaae J, Philipsen PA, Wulf HC. Photodynamic therapy of necrobiosis lipoidica using methyl aminolevulinate: A retrospective follow-up study. Photodiagnosis Photodyn Ther [Internet]. 2018;22:223-6.
21. Rajabi-Estarabadi A, Aickara DJ, Hirsch M, Williams NM, Maranda EL, Van Badiavas E. Laser and light therapies for the treatment of necrobiosis lipoidica. Lasers Med Sci. 2021;36(3):497-506.