

# Case number 19<sup>th</sup> of perforating necrobiosis lipoidica worldwide

## Abstract

Perforating necrobiosis lipoidica is a secondary perforating disease with necrobiotic collagen elimination through the epidermis in diabetic patients. Lesions are very similar to classic necrobiosis lipoidica but in the former there are keratotic plugs over the raised borders of the atrophic yellow plaques. It is explained by necrotic collagen on upper dermis causing inflammation and breaking on through the hair follicle wall or abnormal channels connecting dermis with the outside. In spite of its low frequency, this manuscript highlights the first case reported in Colombia, the 19<sup>th</sup> case worldwide.

**Keywords:** necrobiosis lipoidica, perforating dermatosis, diabetes, collagen

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**Abbreviations:** PNL, perforating necrobiosis lipoidica;

## Introduction

PNL is a disease belongs only to diabetic patients whom presents transepidermal elimination of dermal components like necrotic collagen due to abnormal vascularization and metabolism like consequence of diabetes, causing an inflammatory reaction with keratinization disturbance and building channels in order to be discharged.<sup>1-3</sup> These last could be seen like hyperkeratotic plugs on the purpuric raised border on the typical necrobiosis lipoidic lesions with yellow dye and anetodermic central area.

The most of patients do not have symptoms, although they may feel pruritus. With the passing of the time, it may be ulcerated and there is only 1 reported case with progression to epidermoid carcinoma.<sup>4,5</sup>

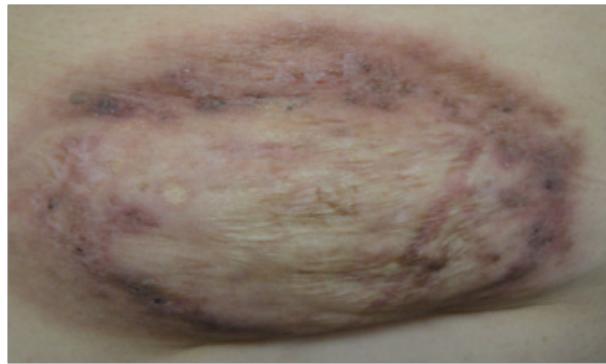
Therapy may be local or systemic and the outcomes are the most of time, unsuccessfully.<sup>6</sup> Herein, it describes the 19<sup>th</sup> worldwide case of PNL. It is about a female diabetic patient with poor metabolic control and cutaneous typical of PNL, consisting in so many pale anetodermic, atrophic plaques with purpuric raised borders on top of these it could be seen indurated comedo-like lesions, alopecia and crater shape depressions and soft nodules with pores with viscous material draining outside of the skin through them. Two biopsies are taken from the borders of two plaques and there have found the features of a perforating dermatosis.

With the diagnosis made, it is started tacrolimus 0.1% ointment therapy twice daily with minimal improvement, so patient is referred to internal medicine to achieve metabolic control.

## Case report

49 years old female patient, living in Medellín, with a personal history of 5 years with diabetes and dyslipidemia, under metformin and lovastatin irregular therapy. The patient has so many oval plaques on the chest, abdominal wall and extremities with the same evolution time, which are brown and orange color with crusts and gray scale on the surface. Other types of plaques have an annular shape with purple and brown raised borders; over these there are comedo-like lesions

(Figure 1), crater-like depressions and hair absence, instead the center skin is atrophic and with palpation it feels like herniation. Besides, it is seen indurated orange plaques with sinus tracts, some of them interconnected. Over the plaques are seen painful, erythematous, soft nodules with a central pore through which viscous discharge comes out. The sensitivity is conserved. Diascopy is negative.



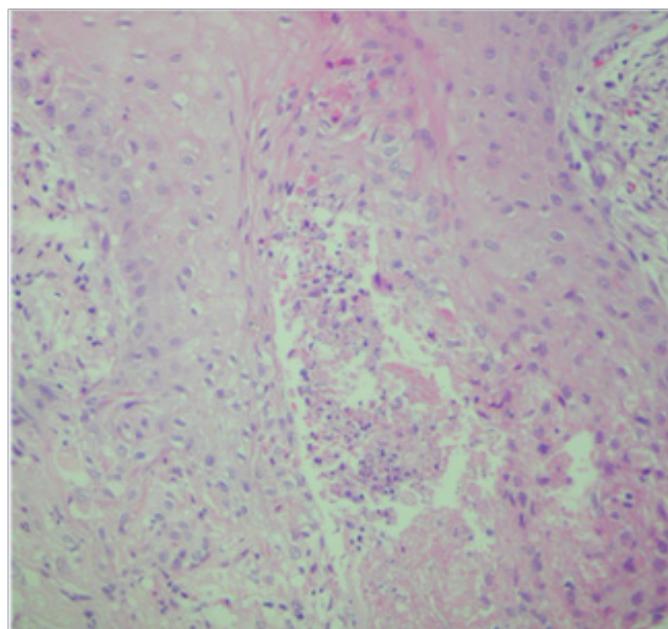
**Figure 1** An annular plaque with the central atrophic area and purpuric, raised borders with comedo-like lesions.

Laboratory tests show fast glycemia of 364mg/dl, glycated haemoglobin of 14.3%, alanine aminotransferase of 69U/L, aspartate aminotransferase of 61U/L, triglycerides of 202mg/dl and urine screen showing urine glucose level up 1000mg/dl. Meanwhile thyroid hormone, hemogram profile and creatinine are normal.

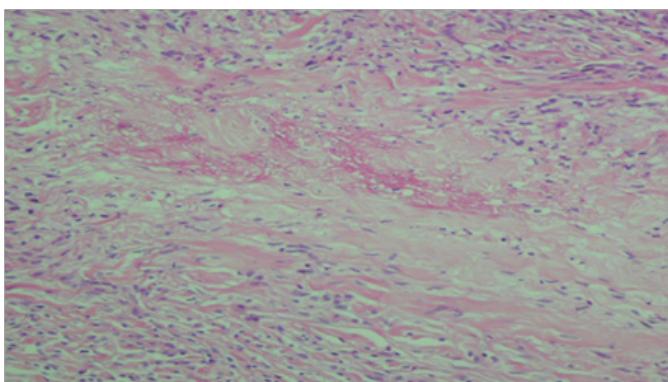
From the border of two plaques are taken 2 biopsies and with hematoxylin eosin staining it is evident a dilated follicular infundibulum keratin fulfill and degeneration changes of dermal collagen.

With a closer view is possible to see the degenerated collagen being discharged outside through the hair follicle (Figure 2) and in the dermis, palisaded granulomas with necrobiotic collagen (Figure 3). This finding aims to a perforating dermatosis. There are not mucin deposits with Alcian blue staining. Neither is it present elastic fibers with the staining for their recognition.

With clinical and histological features PNL diagnosis is made. Then, therapy with tacrolimus ointment 0.1%, twice daily is started, but the patient does not get better so she is referred to internal medicine to achieve metabolic control.



**Figure 2** Necrobiotic collagen transfollicular elimination (HE 10X).



**Figure 3** Palisaded dermal granulomas and necrobiotic collagen in the center (HE 10 X).

## Discussion

PNL belongs to the group of perforating secondary diseases in which there is transfollicular or transepidermal elimination of abnormal material from the upper dermis.<sup>1,2</sup>

There are few case reports in the literature like it is shown in the next Table 1.

**Table 1** Reported cases of PNL in the literature

1977	3 reported cases by Parra et al. <sup>8</sup>
1981	1 reported case by García et al. <sup>9</sup>
1986	1 reported case by Peteriro et al. <sup>10</sup>
1987	1 reported case by Aloia et al. <sup>11</sup>

Table Continued....

1996	2 reported cases by Lefaki et al. <sup>12</sup>
1996	1 reported case by McDonald et al. <sup>6</sup> Perforating elastosis in necrobiosis lipoidica
1999	1 reported case by De la Torre et al. <sup>13</sup> : Necrobiosis lipoidica: a case with prominent cholesterol clefting and transepithelial elimination
2003	2 reported cases by Pestonic et al. <sup>16</sup> ; two girls with type I diabetes
2005	1 reported case by Vanhooteghem et al. <sup>14</sup> : epidermoid carcinoma related with PNL
2008	1 reported case by Abdulla et al. <sup>2</sup> ; an afroamerican woman with PNL
2008	1 reported case by Hammami. <sup>7</sup> ; PNL in a girl with type I diabetes
2012	1 reported case by Mazzochi et al. <sup>15</sup> ; Koebner phenomenon in NLP
2013	1 reported case by Lozanova et al. <sup>1</sup> ; disseminated NLP
2017	1 reported case by Kluger et al. <sup>5</sup> ; epidermal cyst histopathology at the raised border of PNL lesions

PNL, perforating necrobiosis lipoidica

The last reports add up a total of 18 cases plus the one herein described report are 19 worldwide, being the unique case in Colombia, all of them with diabetes mellitus, which it is related in the 90% of cases, affecting teenagers with type I diabetes and women between 40 and 60 years old with type II diabetes.<sup>1,2,5-15</sup>

The prevalence is 0.3% in adults, and 0.06% in children. Regarding the gender, women are more prone to suffer this condition with a ratio of 3:1, between 30 to 60 years old.<sup>2,15,16</sup>

According to pathogenesis, it is known diabetes microangiopathy causes necrosis of collagen, which is expelled transepidermal or transfollicular way.<sup>3</sup> The first way, the abnormal collagen induces the focal keratinization on the epidermal basal layer, instead of in the corneal layer like it is usual, building perforating channels through be taken out.<sup>17-19</sup> In the second way, necrobiotic collagen breaks hair follicle wall, causing anexal destruction.<sup>20</sup> The entire process is allowed thanks the inflammation of abnormal dermal components (collagen, elastin or even cholesterol crystals).<sup>13,15</sup>

Clinically lesions begin with asymptomatic erythematous plaques, with raised dusky red border, with slow growth and outer comedo-like lesions which leave a crater like depression when are removed (transfollicular elimination) or with kyperkeratotic papules (transepidermal elimination).<sup>4,5</sup> The central area becomes atrophic and with yellow dye. With the passing of time alopecia happens.

Lesions take place mainly in legs, but they may be present in the hands, fingers, forearms, face and scalp.<sup>6</sup> It could be happen Koebner phenomenon.<sup>15</sup> Usually, the course is chronic and lesions may progress and scars and be complicated with ulcers in 25% to 33% of patients, causing pruritus and burn sensation. There is only one case with progression to epidermoid carcinoma in the literature.<sup>6,14</sup>

Histopathologic findings are collagen necrobiosis and its elimination through hair follicular wall or perforating epidermis directly. Besides is noticed granulomatous inflammation of subcutaneous tissue.<sup>6</sup>

The main differential diagnosis is perforating granuloma annulare<sup>2,17</sup> which shares the feature of being a secondary perforating granulomatous dermatosis and also it is related to diabetes in 30% of

cases. Similar a PNL, lesions are annular plaques with erythematous raised borders in the extremities and chest, but without the high level of atrophy and the yellow color, and there are not comedo-like lesions.<sup>4</sup>

Others diagnosis to keep in mind are sarcoidosis, necrobiotic xanthogranuloma, lichen sclerosus and erythema induratum of Bazin.<sup>1,21</sup>

Treatment consists in reaching right metabolic control and it may be local or systemic. Former it is about corticosteroids or bovine collagen application under occlusion, local retinoids and puva therapy, photodynamic therapy, tacrolimus, intralesional corticosteroids, intralesional tumor necrosis factor alpha inhibitor and the application perilesional heparin.<sup>21</sup> Systemic therapy consists in systemic corticosteroids, nonsteroidal anti-inflammatory drugs like dipyridamole, citostatic agents, clofazimine, ticlopidine and thalidomide. Some cases have successful outcomes with surgery. Either local or systemic, treatment does not offer a good response.<sup>12,21</sup>

## Conclusion

Being PNL an entity with few reported cases, it has highlighted the 19<sup>th</sup> case in Colombia, all of them in diabetic patients with poor metabolic control and unsuccessful outcomes with different treatments.

## Acknowledgements

None.

## Conflict of interest

Author declares no conflict of interest.

## Patient consent form

The patient agreed with his case report and came back to the dermatology department to follow up.

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