

## Necrobiosis Lipoidica Diabeticorum as a Sign of Diabetes

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**Necrobiosis lipoidica (NL)** is a rare chronic disease. The exact cause is unknown, however, different theories suggest that it is due to a vascular disturbance involving immune complex deposition or microangiopathic changes resulting in collagen degeneration. NL has increased prevalence in patients with diabetes and is more common in females aged 30-40 years old. All patients with NLD should undergo screening for diabetes with yearly HbA1c measurements. NLD could be the first presenting sign of diabetes.

A thirty-four-year-old Bahraini female, known case of gestational diabetes on diet presented with right leg skin changes. The patient was diagnosed clinically and confirmed by punch biopsy as a case of NLD. The patient was treated with Daivobet and Daflon tablets twice a day, which resulted in noticeable improvement.

*Bahrain Med Bull 2018; 40(1): 52 - 54*

Studies have revealed that NLD is seen in people with diabetes, most commonly type 1. However, it may present in people with other autoimmune diseases<sup>1</sup>.

NLD is a type of skin eruptions that occur on the lower legs. The average age of onset is 30 to 40 years, but it could present at any age and tends to occur earlier in diabetics; it is three times more common in females than males. NLD develops as a slightly raised shiny red-brown patch with a yellowish center. Typically, multiple patches develop and might progress to open sores that take a long time to heal; it is usually surrounded by blood vessels that are easily visible under the skin (telangiectasia)<sup>2</sup>. Many etiological theories have been proposed, but the exact cause is unknown. Nevertheless, the most accepted theory is that it is due to a vascular disturbance involving immune complex deposition or microangiopathic changes resulting in collagen degeneration. NLD usually occurs in people with diabetes mellitus, family history of diabetes or those predisposed to diabetes. NLD could be confused with similar conditions, such as Granuloma Annulare, which appears as individual spots, usually consisting of a circular array of reddish to brown and slightly translucent bumps. Other similar conditions include lipodermatosclerosis, necrobiotic xanthogranuloma, and diabetic dermopathy. Skin biopsy should be performed to confirm the diagnosis of NLD.

The aim of this presentation is to review the diagnostic tests and available treatments for NLD.

### THE CASE

A thirty-four-year-old Bahraini female, with history of gestational diabetes on diet control presented with skin changes and swelling of the right leg for approximately 18 months. The patient noticed the skin changes shortly after

trauma to the site. The patient was healthy looking, slightly overweight. Examination of the right lower leg revealed a well-demarcated orangey red indurated plaque with surrounding hyperpigmentation patch, see figure 1.

The clinical features were classic of necrobiosis lipoidica. A skin punch biopsy and blood tests were performed. Blood investigations including CBC, U and E, RFT, LFT and lipid profile were within normal range except HbA1c, which was 10%.

Skin biopsy showed necrotic collagen bundles surrounded by histiocytes with granuloma formation, associated with plasma cells and lymphocytes. No malignancy was seen, and the appearance was consistent with NLD, see figures 2 and 3.

The patient was referred to the diabetic clinic for blood sugar control. In the meantime, the patient was started on topical Daivobet and Daflon tablets twice a day. The patient's condition improved, and the dosage was reduced with every follow-up, see figure 4. During the follow-up, HbA1c was regularly tested and remained stable at 10%.

The patient was put on Daivobet twice a day (topical steroid and Calcipotriol) in addition to Daflon to limit the progression of the necrobiosis and edema. The lesion improved during the six months follow-up and the patch decreased leaving post-inflammatory hyperpigmentation, which was treated with mix bleaching creams (Hydrocortisone 1%, Tretinoin 0.05% and Hydroquinone 4%) applied once at night, see figure 2. Although we advised the patient to follow-up with the diabetic clinic as her HbA1c was constantly high, she was not compliant with her medications. The patient was lost to follow-up for her diabetes and was not very committed to her treatment plan.

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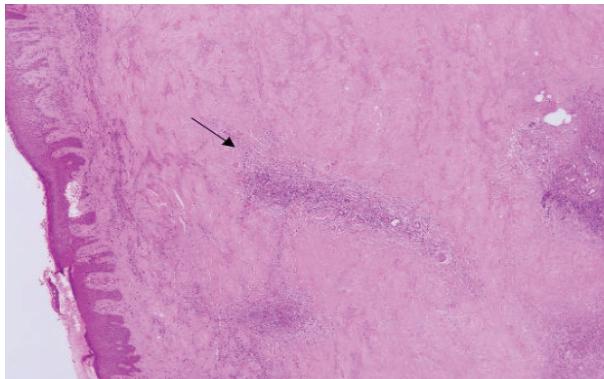
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**Figure 1: NLD before Treatment**



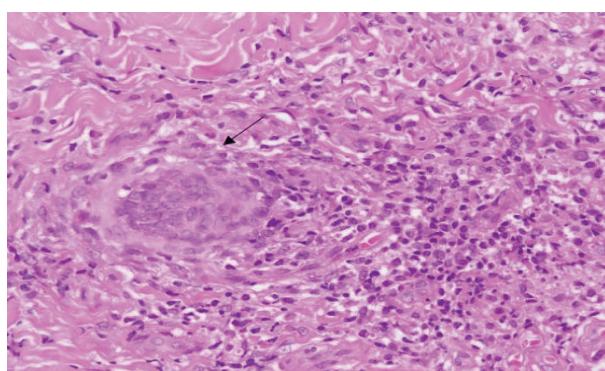
**Figure 2: Inflammatory Cells Lymphocytes and Plasma Cells**

## DISCUSSION

Necrobiosis lipodica is a disease of collagen resulting in degeneration and granulomatous reaction, fat deposition and thickening of the wall of the blood vessels. The disorder progresses and could result in severe ulceration of the underlying tissue. In rare cases, infection may occur, which is difficult to treat. NLD is more common in patients with diabetes mellitus<sup>3</sup>.

Histopathologically, NLD is interstitial granulomas seen in the subcutaneous tissue extending to the dermis. At low magnification, NLD has a very characteristic appearance. The granulomas are mixed with areas of collagen degeneration and organized in a row-like fashion<sup>4</sup>. The granulomas are composed of lymphocytes, histiocytes (some of them multinucleated), eosinophils and sporadic plasma cells. Reduction in the number of intradermal nerves is an additional feature of necrobiosis lipoidica<sup>4</sup>. NLD patients should be screened for diabetes mellitus.

There is no proven effective treatment for NLD; in the ulcerative type, treatment is not very satisfactory. The disease is typically chronic with variable progression and scarring. NLD



**Figure 3: Granuloma Formation**



**Figure 4: NLD 6 Months after the Treatment**

may ulcerate as a result of any minor trauma. Patients advised leg rest and elastic support stockings to protect the legs and prevent complications, especially in lymphedema or associated venous disease. Treatment options for NLD include: topical or corticosteroid injections, which decrease the inflammation of active lesions and reduce the size of ulcers. In severe cases, prednisone could be used<sup>5</sup>.

Ulcerated NLD could be treated successfully with topically applied bovine collagen. Collagen is thought to increase macrophages and neutrophils number at the site, which stimulates debridement and causes the formation of granulation tissue that improves the healing process.

NLD is an unpredictable disease which could be stable and suddenly flares up. Courses of topical Psoralen and UVA light therapy have proven to be effective in controlling the disease in the active phase.

A baby aspirin tablet daily and other medications that thin the blood showed a mild decrease in the progression of NLD in some studies.

Tacrolimus and Cyclosporine have been used with success in treating ulcerated necrobiosis lipoidica. Excision and grafting have been successful in severe ulcerating NLD cases, but recurrence may take place secondary to the underlying vascular damage with poor healing of the graft site.

In a review study, patients with diabetes mellitus (type 1 and type 2); the authors compared glycemic control and developing NLD<sup>6</sup>. Approximately 30%-91% of patients with diabetes will develop at least one cutaneous manifestation. Glycemic control may affect the progression of necrobiosis lipoidica in patients with diabetes<sup>6</sup>.

Glucose control has no effect on the appearance of necrobiosis lipoidica diabetorum or the progression of the lesion. NLD in people with diabetes is usually associated with poor glycemic control<sup>6</sup>.

## CONCLUSION

**NLD is a rare chronic skin disease commonly seen in diabetic patients. Skin biopsy should be performed to confirm the diagnosis and initiate the appropriate treatment. A case of NLD was reported; the patient was treated with steroids and anti-diabetic therapy.**

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**Author Contribution:** All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

**Potential Conflicts of interest:** None.

**Competing interest:** None.

**Sponsorship:** None.

**Acceptance date:** 27 January 2018.

**Ethical Approval:** Approved by the Research Ethical Committee, Bahrain Defense Force Hospital, Bahrain.

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