

## Microbial abscesses in the posterior neck region in a decompensated diabetic patient

Raúl Romero-Cabello<sup>1,2,3\*</sup>, Mario A. Rodríguez-León<sup>3,4</sup>, and Edgar Álvarez-Trejo<sup>3</sup>

<sup>1</sup>Service of Infectology, Hospital General de México "Dr. Eduardo Liceaga"; <sup>2</sup>Faculty of Medicine, Universidad Nacional Autónoma de México (UNAM);

<sup>3</sup>Instituto para el Desarrollo Integral de la Salud; <sup>4</sup>Facultad de Estudios Superiores Zaragoza, UNAM. Mexico City, Mexico

### Abstract

We present the case of deep abscesses in the posterior region of the neck in a 47-year-old man, decompensated diabetic, with a history of supracondylar amputation 3 years earlier, hypertensive and with proteinuria. The lesion consisted of an abscess that left two coalescing wounds in the fundus upon drainage: one 5 cm in diameter and 2 cm deep, the other 2.5 cm in diameter and 2 cm deep. The abscess was managed with mixed systemic antibiotic therapy (clindamycin plus clavulanic acid/amoxicillin orally and, drainage and debridement, as well as dressings with hydrogen peroxide and packaging with phenytoin suspension, non-adhesive hydro-foam with silver and a dressing with polyhexamethylene biguanide. 0.2%). The evolution was favourable with the control of the infection, granulation of the wound, adhesion of the skin to deep tissue and closure. In parallel, the metabolic and cardiovascular monitoring and control of the patient was carried out. The experience is shared for the handling of possible similar cases.

**Keywords:** Deep neck abscesses. Diabetic chronic complications. Local phenytoin adjuvant. Cutaneous abscess in diabetes.

### Introduction

The persistent imbalance of the metabolic state of diabetic patients determines different chronic complications, of which the following are the most noteworthy: angiopathies, neuropathies, retinopathies and nephropathies; these disorders lead to advanced stages of organ deterioration with consequent dysfunctioning and permanent damage<sup>1,2</sup>. This lack of control is directly responsible for the loss of years of healthy life (HLY)<sup>3,4</sup>, in addition to the enormous expense incurred by health systems and family pockets<sup>5</sup>.

The most painful aspect of this situation is the gradual evolution of patients with diabetes, who lose their capacities, health, money and the appreciation of their family: they become a major social burden. This is

unfair, as although diabetes is still a disease without a cure, there are now different resources for the effective prevention and optimum control thereof.

One of the worst consequences of chronically decompensated diabetes is immune deterioration, which renders the patient susceptible to infections, which occur in more severe forms and for longer periods of time, in particular dermal and subdermal lesions that usually appear in extremely severe forms, severe progressions and frequent systemic complications that can lead to death (Fournier's gangrene, for example); the aggressive and resistant behaviour of infectious agents in these cases is also well-known<sup>2,6,7</sup>.

We will now present a case that demonstrates these facts and which, fortunately, was evaluated at a time

### Correspondence:

\*Raúl Romero-Cabello

E-mail: romerocabello@idisalud.com

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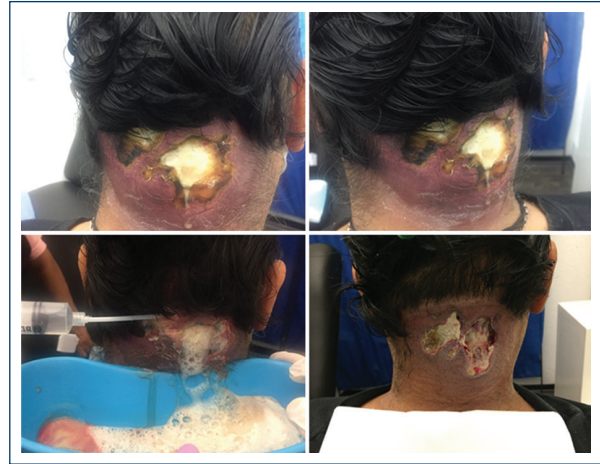
that enabled the patient to undergo outpatient treatment with no further complications.

### Case study

A 47-year-old single man with a somewhat relevant background: his mother and daughter are diabetics, he reports no addictions and goes to the gym 5 to 6 days a week to lift weights. He underwent a supra-condylar amputation of the right pelvic limb three years ago due to a complicated neurovascular diabetic foot condition and he uses a prosthesis; he registered glucose levels of up to 500 mg/dL in that episode. He has known he has diabetes since that time (three years) when he was also diagnosed with high blood pressure, reason for which he receives treatment with insulin detemir (40 IU/day SC), captopril (25 mg/day) and a specific diet. He emphasises that he has never been a patient prone to self-care and therapeutic adherence. It proved impossible to collect more information that would have allowed for a better understanding of his metabolic status and control in the three years since he found out he was diabetic.

He attended an appointment for diabetes control with his doctor three days prior to getting in touch with us. She noticed a lesion on the back of his neck, reason for which she referred him to our Institute. The patient could not specify the time of the onset of this lesion, but he stated that “I stopped going to the gym that week” (sic) because of it. He was not given any specific treatment for the lesion, but it should be pointed out that he did not visit us immediately, but only 3 days later when he noticed that the lesion had hardened and increased in size. This lesion is located on the back of his neck; it evolved into a large bacterial abscess measuring 10 cm x 10 cm, with significant swelling and two superficial necrotic lesions, with significant perilesional inflammation. No fever, BP 130/90 mm Hg and capillary blood glucose 273 mg/dL. The result of the secretion culture was positive for coagulase *Staphylococcus aureus*.

After obtaining the patient’s informed consent for his outpatient care and consent for any future publication of his case, we proceeded to clean up and drain the purulent abscess, remove the necrotic tissue, and tunnel the abscess to the outside, washing and irrigating the sac. It was padded with non-adhesive hydrophilic silver foam (Betaplast®). His capillary blood glucose was 85 mg/dL and, in general, his laboratory tests were within normal parameters, except for blood glucose (153 mg/dL), low



**Figure 1.** Day 1: initial appearance of the abscesses and the debridement process.

HDL cholesterol (28.5/dL), glycosylated hemoglobin (9.9%) and proteinuria +++. Blood pressure of 130/90 mm Hg.

Systemic treatment consisted of clindamycin 300 mg every 8 hours plus amoxicillin (850 mg) with clavulanic acid (125 mg) every 12 hours. Diabetes management was continued, as was antihypertensive monitoring.

Day 1: The abscesses were debrided and drained, the necrotic tissue was removed (Fig. 1) and a healing strategy was established every 3 days based on hydrogen peroxide followed by padding with hydrophilic silver foam (Betaplast®), an antimicrobial dressing with polyhexamethylene biguanide (PHMB) 0.2% (Kendall Kerlix®).

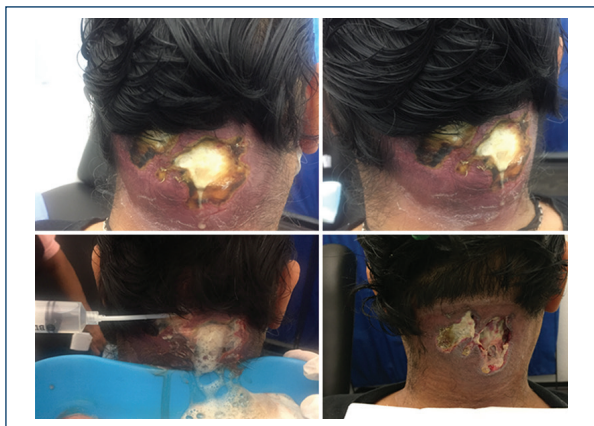
Day 3: The same management of the lesion; curing it with hydrogen peroxide and applying the same compounds; the use of phenytoin suspension 125 mg/5 mL was added to the lesion).

A minimal amount of purulent secretion persisted from days 8 to 15 and the same systemic and lesion management was continued (Fig. 2). Healing sessions in the doctor’s surgery were then scheduled for every 7 days, at which the patient’s metabolic levels were within the normal limits.

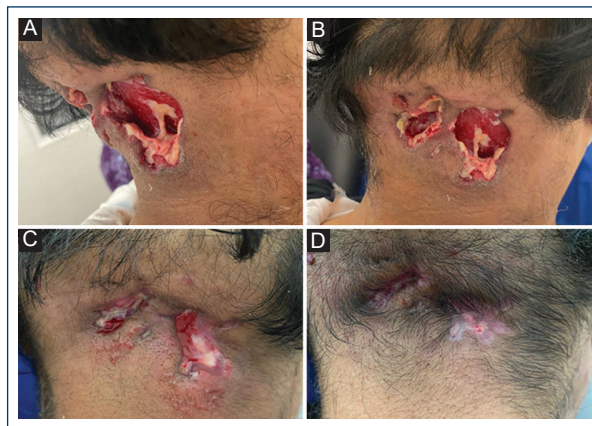
Day 22: Granulation tissue was identified. A considerable reduction in the diameter of the two lesions was registered and there was no evidence of infection (Fig. 3).

Day 29: Healing with a soapy solution and use of the same padding method; antimicrobial treatment was discontinued.

The diameter of the lesions is already 50% smaller.



**Figure 2.** Appearance of the lesions on day 8.



**Figure 3.** A and B: appearance of the lesions on day 22. C and D: on days 36 and 40.

Day 43: No signs of infection or inflammation and the skin is already attached to the deep tissues (Fig. 3). Healing with the use of a soapy solution, phenytoin, hydrogel and hydrofoam. The lesion was covered with an antimicrobial absorbent dressing with PHMB (Kendall Telfa AMD®).

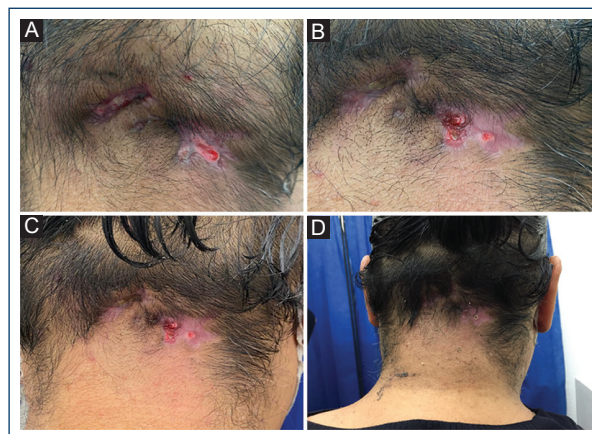
Day 50: Discharge (Fig. 4).

## Discussion

The type of lesion in our patient is not unusual; however, its anatomical location provided it with the potential for regional and even systemic damage. His chronically decompensated diabetic condition (glycosylated Hb 9.9% in the initial examination) surely contributed to the worsening of a lesion that might have been caused by his weight-lifting activity. Regarding the current lesion, it should be pointed out that at no time did the patient complain of pain – neither spontaneous nor due to the healing process - despite undergoing an inflammatory process and significant induration. He has obviously had diabetes for longer than he admits: 3 years; in fact, his initial diagnosis was related to the amputation of a lower limb and his subsequent insulin-based management has been inconsistent.

*Staphylococcus aureus* is the cause of frequent severe skin and subcutaneous tissue lesions in this type of patient, which are usually complicated in terms of length, depth and therapeutic difficulty. The involvement of chronic vascular and nerve damage affects.

The images illustrate the serious nature of the case. The absolute indication was his referral to the hospital for treatment, a fact the patient flatly refused. This emphatic refusal and the prevailing COVID-19 pandemic



**Figure 4.** A, B and C: appearance of the lesions towards final evolution. D: day 50, the patient is discharged.

led to the decision to treat him on an outpatient basis with close monitoring of adherence, in addition to obtaining his informed and responsive consent. It is true to say that several factors contributed to the positive evolution of the condition: it was still opportune, or in other words, the local and systemic conditions remained stable, as well as the patient's adherence to the treatment prescribed and the support of his family. The therapeutic approaches – both local and systemic, were positive: drying and hydrophilic foam, as well as phenytoin, a compound that has proven to be effective on its own<sup>8-11</sup> and combined<sup>12</sup> for this indication. The local use of phenytoin dates back 60 years, and was originally used for oral lesions<sup>9</sup>; its topical indication is useful for speeding up the healing process due to the proliferation of low-concentration keratinocytes, which achieves the expression of dermal procollagen type I



and a reduction in the expression of the inflammatory agent JAK3<sup>10</sup>, as well as its lipid impact, which has been illustrated in diabetic foot ulcers<sup>9,10</sup>. The use of phenytoin begins once there is no sign of infection in the tissue and when granulation tissue appears.

This experience has been shared as a case of absolute exception. Under no circumstances whatsoever should the outpatient management of this type of lesion and its obvious severe scope be encouraged: the indication for hospitalisation is absolute. We are sharing it in this manner, as an exception to the successful ending. The local treatment of the lesions, in addition to the adjuvant use of antimicrobials, topical phenytoin and strict follow-up procedures allowed for relief.

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## Conflicts of interest

The authors declare that they have no conflicts of interest.

## Ethical disclosures

**Protection of people and animals.** The authors declare that no experiments have been performed on humans or animals for this research.

**Data confidentiality.** The authors declare that no patient data appears in this article.

**Right to privacy and informed consent.** The authors have obtained the informed consent of the

patients and/or subjects referred to in the article. This document is in the possession of the corresponding author.

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