

## Case Report

# Use of Figueiredo's technique for treating extensive infected skin lesions – a case report

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## Abstract

Demonstrate that a low-complexity surgical technique can effectively solve problems of extensive skin lesions in cities where microsurgical techniques are not available. We present a 59-year-old male patient with diabetes mellitus and an extensive and infected lesion in his right ankle region, suggestive of a diabetic foot. Urgent surgical treatment was performed with debridement of the devitalized tissues, drainage of a large amount of purulent secretion, and exhaustive washing with 0.9% saline solution. After a new debridement, abundant washing with 0.9% saline solution and coverage of the extensive bloody area with a polypropylene prosthesis were performed. He remained under outpatient follow-up, and subsequently, twice, new cleanings were performed, and a small diameter mesh was applied due to the good evolution of healing. A good range of motion was maintained in the right ankle and foot, with the medial wound completely healed, leaving only a small area of the lateral wound to complete the healing process. Figueiredo's technique, described in 2017 for fingertip lesions, uses a flexible thermoplastic polymer, which can be obtained from a small portion of silicone from a saline bag, to form a semi-occlusive dressing that allows the drainage of secretions and provides a favorable environment and temperature for healing. The exact limits of this technique are not yet well established, but the practice has shown excellent results in larger lesions. Figueiredo's technique is a simple, low-cost, and effective option for treating extensive infected skin lesions.

**Level of Evidence IV; Therapeutic studies; Case Report.**

**Keywords:** Skin lesion, Polypropylene; Wound healing.

## Introduction

Extensive skin loss has always been a challenge for surgeons. Microsurgical skin flaps are considered the most appropriate procedure for resolving this type of lesion, but they are technically dependent on microsurgeons with specialized training and high-cost specific material, including microscopes that are not always available<sup>(1,2)</sup>.

Furthermore, they require a donor area of skin tissue, generally coming from a non-injured area of the patient, and a surgical procedure in a non-injured donor area could cause some consequences for that area<sup>(3)</sup>.

In an attempt to find a solution without these difficulties, using the regenerative capacity of our own body and intervening only in the injured area, in 2017, Figueiredo LA described a technique for covering lesions with a polypropylene prosthesis, allowing the body to perform its healing by secondary intention, in a protected manner and without the need to use an intact donor area for grafts and flaps<sup>(1)</sup>.

Some techniques using the protection of synthetic materials to obtain secondary healing, especially in small open areas such as the fingertip or nail region, have already been described, all with advantages and disadvantages<sup>(4,5)</sup>.

Study performed at the Hospital Português de Beneficência em Pernambuco, Recife, PE, Brazil.

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In Figueiredo's technique, the prosthesis is low-cost, easy to obtain at any medical service, and translucent, allowing for better monitoring of the case's evolution<sup>(1,2)</sup>. An important advantage that we must consider about this technique is the low cost, as it uses widely available and cheap materials, does not require high-cost microsurgical therapies, has a relatively quick hospitalization time, and reduces intravenous antibiotic therapy compared to other procedures<sup>(3)</sup>.

The exact limits of this technique are not yet well established, but the practice has demonstrated excellent results in larger lesions<sup>(2)</sup>.

Therefore, we consider it important to describe the case of an extensive infected skin lesion successfully treated using Figueiredo's technique.

## Case report

We present a 59-year-old male patient with diabetes mellitus and an extensive and infected lesion on the lateral and medial regions of his right ankle, suggestive of a diabetic foot, on December 27, 2021. Urgent surgical treatment was performed with debridement of the devitalized tissues, drainage of a large amount of purulent secretion, and exhaustive washing with 0.9% saline solution, resulting in open areas with a small secretion (Figure 1). On January 09, 2022, a new debridement was performed + abundant washing with 0.9% saline solution. The extensive bloody areas of the right ankle were also covered with protective mesh-a polypropylene prosthesis (Figures 2 and 3). After hospital discharge, the patient was instructed to change the dressing weekly, taking care not to damage the protective

mesh. He remained under outpatient follow-up, and on April 02, 2022, it was decided to perform a new surgical cleaning and application of mesh with a smaller diameter due to the good healing progress. The patient attended the service weekly for dressing changes until March 04, 2022, when he was submitted to a new surgical procedure to replace a new polypropylene prosthesis in dimensions more appropriate to the diameter of the remaining area. The wound was treated only with cleaning surgery + Figueiredo's technique. During the healing process, there was no secretion, worsening of the clinical condition, or need for antibiotics. Cephalexin was used only seven days after each change of the protective mesh. The physical examination revealed a considerable healing process and good perfusion in the affected limb. The patient began receiving home care from the "Melhor em Casa" program with a multidisciplinary team to change dressings and monitor the lesion. He maintains a good range of motion in his right ankle and foot, with the medial wound completely healed, with only a small area of the lateral wound remaining to complete the healing process. He is currently awaiting further feedback to define the final course of action regarding the lateral area (Figure 4).

## Discussion

Figueiredo's technique, described in 2017 for fingertip lesions, uses a flexible thermoplastic polymer, which can be obtained from a small portion of silicone from the saline bag, to form a semi-occlusive dressing that allows drainage of secretions and provides an environment and temperature favorable to healing. In short, the principle of Figueiredo's



**Figure 1.** Initial appearance of the medial and lateral bloody areas.



**Figure 2.** Cover of the lateral area with polypropylene protection.



**Figure 4.** Current appearance of the lesion.



**Figure 3.** Cover of the medial area with polypropylene protection.

Technique for treating skin loss is the inorganic protection of the wound with polypropylene while the body itself carries out its healing process by secondary intention<sup>(1)</sup>.

The aesthetic results of Figueiredo's technique demonstrate a better appearance than other techniques, which can be attributed to the fact that it preserves the characteristics of the lesion site. In contrast, other methods transfer the characteristics of the donor area to the recipient area, changing the appearance and aesthetic of both<sup>(1)</sup>.

The wound was treated only with cleaning surgery + Figueiredo's technique. During the healing process, there was no secretion, worsening of the clinical condition, or need for antibiotics. This seems to confirm previous work on the technique, which states that the exudate provides an environment that favors healing without infection<sup>(1,2)</sup>.

Secondary healing did not create any type of adhesion over the tendons, and the patient presented results with complete mobilization of the ankle and toes, as already demonstrated in other studies<sup>(1,2)</sup>.


The exact limits of this technique are not yet well established, but the practice has demonstrated excellent results in larger lesions, especially the distal leg, foot, and calcaneus<sup>(2)</sup>.

For these reasons, we decided to use this method on an extensive infected ankle skin lesion in a diabetic patient, a case that many would consider too complex to apply Figueiredo's technique. However, the patient lived in a location without access to microsurgical techniques and did not have the resources to seek a larger health center.

The results were surprising, with a quick and painless evolution to complete closure of the medial wound and, at the time this study was written, almost complete closure of the lateral area, maintaining normal range of motion in the ankle and resolution of the infectious process.

The use of Figueiredo's technique is a simple and effective option for treating extensive infected skin lesions.

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