



## Delayed surgical closure (secondary intention) using the Figueiredo technique: a case series study

*Fechamento cirúrgico tardio (segunda intenção) pela técnica de Figueiredo: estudo de série de casos*

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### ABSTRACT

Surgical wounds, when not amenable to primary healing, can be treated using surgical flaps or grafts, increasing surgery complexity and costs. Seeking to facilitate and optimize access to surgical treatment of malignant neoplasms of the skin, the dressing using the Figueiredo technique is a good therapeutic option due to its easy execution and reproducibility, low cost, and effectiveness. We report a series of cases using this technique after the excision of non-melanoma skin tumors in the extremities.

**Keywords:** Wound closure techniques; Surgical oncology; Skin neoplasms; Extremities

### RESUMO

As feridas operatórias quando não são passíveis de fechamento primário podem ser tratadas com uso de retalhos ou enxertos, o que aumenta a complexidade e o custo da cirurgia. Buscando facilitar e otimizar o acesso ao tratamento cirúrgico das neoplasias malignas da pele, o curativo pela técnica de Figueiredo mostra-se uma boa opção terapêutica devido à facilidade de execução, à reprodutibilidade, ao baixo custo e à sua eficácia. O presente estudo relata uma série de casos utilizando essa técnica após exérese de tumores de pele não melanoma em extremidades.

**Palavras-chave:** Técnicas de fechamento de ferimentos; Oncologia cirúrgica; Neoplasias cutâneas; Extremidades

## Case report

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## INTRODUCTION

The search for techniques to close significant skin defects is a challenge for surgeons. In 1984, the Bogotá bag technique was described for large abdominal defects. It consists of placing a sterile urine collection bag at a cost lower than other materials. It proved to be a simple and effective technique for a complex problem.<sup>1</sup>

After the publication and description of the Figueiredo technique in 2017, the technique was expanded to fingertip repairs to avoid deformities due to non-treatment or poor handling of this type of lesion. The results were satisfactory with functional maintenance of the affected segment.<sup>2</sup>

In traumas with injuries to the nail bed, the bed was repaired and then protected with a polypropylene prosthesis obtained from the saline solution bag. After cutting the material in the exact shape of the wound's bloody area, simple stitches were enough to fix the material on the edge of intact skin, thus accommodating the prosthesis perfectly without pressing the lesion.<sup>2</sup>

Unreliable recipient bed, repeated movement, trauma in the area, or infected wound contraindicate the skin graft.<sup>3,4</sup> The lower limb is a challenging site to graft because of the inevitable shear forces associated with walking. It led to the common practice of postoperative immobilization to increase graft success. Studies show that total skin grafting and slope immobilization increased graft take rates.<sup>5</sup>

Given the data, the Figueiredo technique became an interesting proposal to close extensive defects in extremities in dermatological surgery.

## METHODS

We collected data from August 2021 to May 2022. Table 1 describes the inclusion and exclusion criteria.

Tumor excision was performed with 4 mm margins for basal cell carcinomas (BCC) and 5 mm margins for squamous cell carcinomas (SCC), following the National Comprehensive Cancer Network (NCCN) protocols. We made a cut on one

side of the sterile saline bag with an extra margin of up to 5 mm from the defect. We chose the external face of the bag, without ink printing, to be in contact with the wound and fixed the dressing using simple stitches and nylon thread 0.5 to 1 cm apart until the dressing was comfortably accommodated. Patients were instructed not to wet or redo the external dressing during the first seven postoperative days. The proposed maintenance of the polypropylene cover was six weeks, following the Figueiredo technique description.

## Description of cases

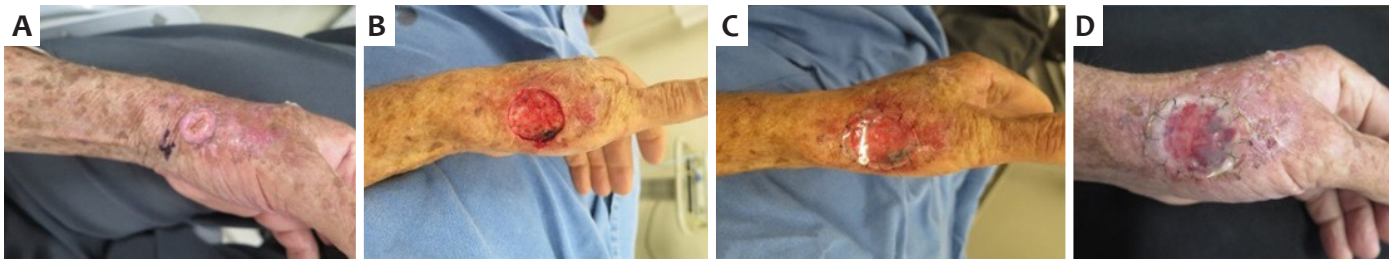
1 - An 80-year-old man presented a 2 cm plaque on the back of his left hand. We performed the excision with a margin of 5 mm, followed by closure with a polypropylene dressing. Anatomopathological examination demonstrated well-differentiated SCC with free surgical margins. The patient evolved uneventfully. He removed the polypropylene cover on the 28th postoperative (PO) day, with complete healing on the 35th postoperative day (Figure 1).

2 - An 89-year-old woman had an 8 cm tumor in the distal portion of her left arm. We performed the exeresis with a 5mm margin and closure with a polypropylene dressing. The anatomopathological examination was compatible with well-differentiated SCC with free margins. She evolved uneventfully (Figure 2).

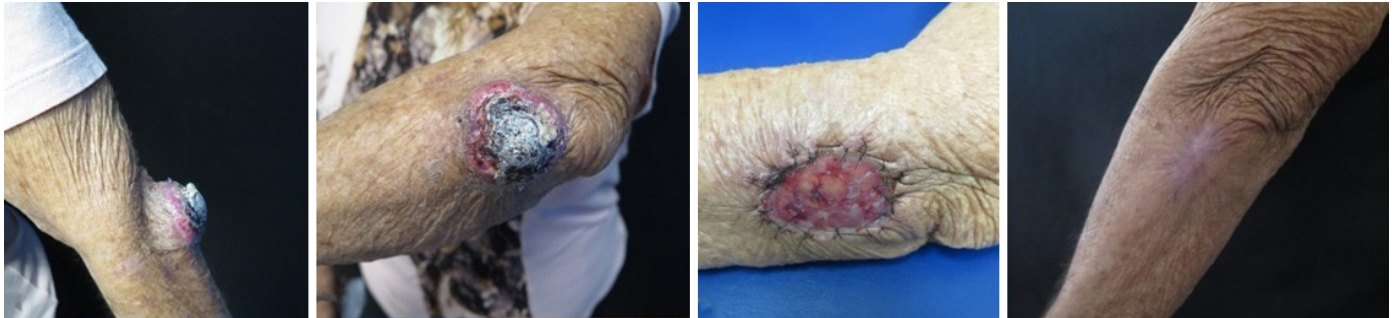
3 - A 92-year-old woman presented an 8 cm tumor on the back of her right hand. She underwent excision with a margin of 5 mm and closure with a polypropylene dressing. The anatomopathological examination was compatible with well-differentiated SCC with free margins. On the 20th PO day, due to signs of surgical wound infection, we instituted antibiotic therapy with amoxicillin/clavulanate 500/125 mg every eight hours for seven days, with a good response. The dressing was removed on the 48th PO day. We observed the complete healing of the surgical wound (SW) on the 120th PO day (Figure 3).

**TABLE 1: Study inclusion and exclusion criteria**

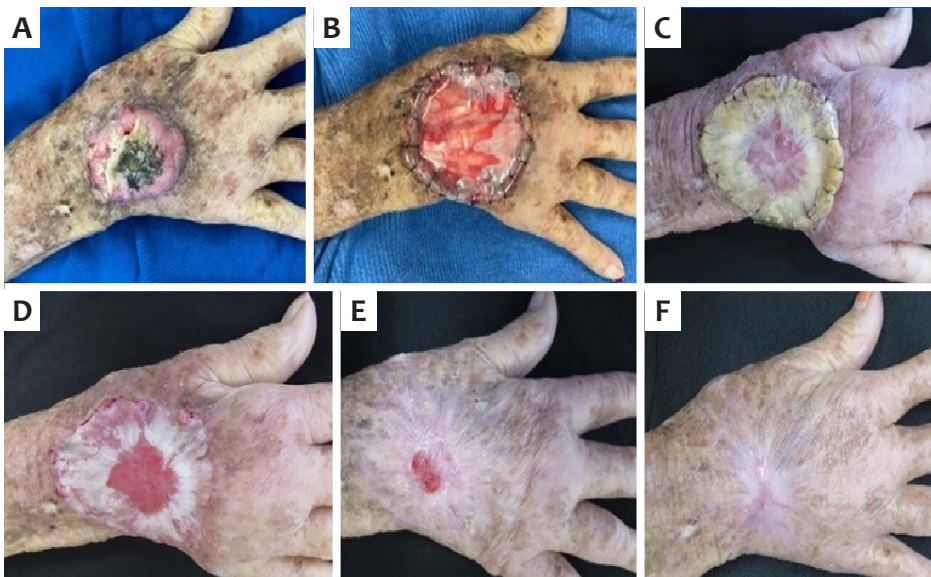
INCLUSION CRITERIA	EXCLUSION CRITERIA
- One or more of the comorbidities (hypertension, compensated diabetes mellitus, limited mobility or osteodegenerative alterations) that, perhaps, limit the patient's comfort	- Patients with tumors capable of primary healing in the preoperative evaluation
- Non-melanoma skin tumors (basal and squamous cell carcinomas) on extremities, both upper and lower limbs	- Patients with decompensated comorbidities
- Patients with little tolerance for decubitus, either due to the criteria already described or due to psychological issues (anxiety and/or restlessness generating little collaboration with the prolonged surgical time)	- Patient refusal after explanation of the technique
	- Patients with a known history of polypropylene allergy
	- Benign lesions on the extremities



**FIGURE 1:** **A** - 2 cm infiltrated erythematous plaque on the back of the left hand. **B** - Intraoperative aspect immediately after removal of the tumor lesion. **C** - Immediate postoperative period, with the polypropylene cover. **D** - 7th postoperative day



**FIGURE 2:** **A** and **B** - 8 cm tumor in the distal portion of the left arm. **C** - 7th postoperative day. **D** - 46th postoperative day



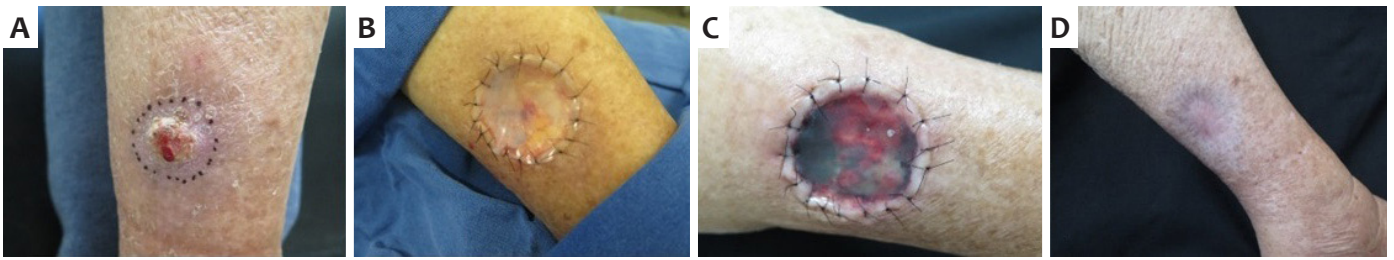
**FIGURE 3:** **A** - Erythematous tumor measuring 8 cm on the dorsum of the right hand. **B** - Immediate postoperative period, with polypropylene cover. **C** - 48th postoperative day, before removal of the polypropylene dressing. **D** - 48th postoperative day, immediately after removal of the polypropylene dressing. **E** - 63rd postoperative day. **F** - 120th postoperative day

4 - An 86-year-old man had a 1.5 cm plaque on the posterior side of his left leg. Incisional biopsy was compatible with well-differentiated SCC. We performed the exeresis with a margin of 5 mm, followed by closure using the Figueiredo technique. After an uneventful evolution, he removed the polypropylene dressing on the 61st PO day. We observed complete healing of the SW on the 120th PO day.

5 - An 88-year-old woman presented a 2.5cm plaque on her right leg. We performed the exeresis with a margin of 4 mm and dressing using the Figueiredo technique. The anatomo-

mopathological examination resulted in solid expansive BCC with free margins. The dressing was removed on the 56th PO day, followed by complete healing verified in the evaluation six months after the operation (Figure 4).

6 - A 94-year-old woman had a 3 cm plaque in the region of the left calcaneus. We conducted an incisional biopsy, and the histology was compatible with multifocal superficial BCC. Excision with a margin of 4 mm was performed and closed with a polypropylene dressing. The patient evolved uneventfully, and she removed the dressing on the 56th PO day with complete healing of the surgical wound.



**FIGURE 4:** A - Vegetating plate on the leg. B - Immediate postoperative day with polypropylene. C - 7th postoperative day. D - 18th days with wound healing

## DISCUSSION

Skin tumors of the extremities excised with adequate margins can generate an extensive primary defect with no possibility of primary healing. The alternatives are grafts, flaps, or healing by secondary intention.

In elderly patients, graft closure can present complications resulting from the deficient vascular supply in the extremities, making it challenging for the graft to take.<sup>6,7</sup> Also, we would have to perform a second surgical defect to obtain adequate skin thickness for grafting (donor area). Flaps are identically challenging in these regions: significant defects require long surgical times and large rotations, usually from adjacent areas that are equally photodamaged. Both techniques demand adequately trained and qualified professionals, in addition to a physical structure that includes a complete operating room, factors that, within the scope of the Brazilian public health system, commonly require long waiting times before arriving at a Service for more complex cases.

Healing by secondary intention with special dressings makes it difficult and expensive to treat the patient, burdening the public service since it uses complex and expensive materials and requires a nursing team duly trained in dressings to perform them.<sup>8,9</sup>

The Figueiredo technique uses simple materials and does not require an advanced surgical method. This resource allows early skin tumor excision without the need for a tertiary-level service of the Brazilian health system, resulting in lower cost, higher resolution, and lower morbidity for patients.

We know that one of the key factors for proper lesion healing is adequate wound bed humidity. It is believed that the ideal amount of water favors chemotaxis and keratinocyte migration, leading to lesion closure.<sup>9,10</sup> The polypropylene cover used in the Figueiredo technique protects the surgical wound and creates an adequate humidity environment, benefiting the healing process by secondary intention.

**TABLE 2: Demographic and clinical data**

<b>SEX</b>	
Women	4 (66.66%)
Men	2 (33.34%)
<b>AGE</b>	86 ~ 94 years (Mean 88.16 years)
<b>COMORBIDITES</b>	
Systemic arterial hypertension	5 (83.34%)
Mobility change	2 (33.34%)
Hypothyroidism	2 (33.34%)
Dyslipidemia	1 (16.67%)
Diabetes <i>mellitus</i>	1 (16.67%)
<b>HISTOLOGICAL TYPE OF THE TUMOR</b>	
Well-differentiated squamous cell carcinoma	4 (66.66%)
Expanding solid basal cell carcinoma	1 (16.67%)
Superficial (multifocal) basal cell carcinoma	1 (16.67%)
<b>LESION SIZE</b>	1,5 ~8 cm (Mean 4.16 cm)
<b>TIME WITH THE POLYPROPYLENE DRESSING</b>	35 ~61 days (Mean 50.66 days)
<b>COMPLICATIONS</b>	
Infection	1 (16.67%)




In this case series, only one participant had a surgical wound infection, as described in table 2. We believe this complication occurred due to the hygiene care of the surgical wound. Because of the appearance of the dressing and the low level of education of the participants, some of them were afraid to conduct this cleaning at home.

We conclude that the closure of surgical wounds using the Figueiredo technique brings a new perspective, especially in terms of public health. Regarding the target audience (elderly, with comorbidities, low socioeconomic status), the Figueiredo technique is a fast, easy to access, and simple postoperative management, making it a good option, generating less morbidity for patients. ●

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