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Heel Reconstruction with Medial Plantar Flap after Excisional Biopsy for Melanoma: Case Report

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ABSTRACT

The coverage of soft tissue deficit of the heel, continues to represent a great surgical challenge due to the unique features in this area, developed to withstand large axial and shear loads. The coverage of the heel wounds is considered a priority through an adequate and lasting surgical option that will be the result of a decrease in the morbidity and mortality of the patient.

KEYWORDS: Melanoma, Flap, Plantar, Heel

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INTRODUCTION

Malignant melanoma is the most frequent skin neoplasm, being the most aggressive form of skin cancer. In the United States 106,110 new cases were estimated in 2021: 62,120 men and 43,850 women with a 7,180 deaths per year, being 4,600 men and 2,580 women **[1].** It is currently the fifth most common malignancy neoplasia in men and the sixth in frequency in women in the world; it is associated with high morbidity and mortality due to its aggressive behavior, its elevated risk of regional and distant nodal metastasis. The presence of atypical nevus as well as the high count of bodily nevus, including plantar ones, is the most associated risk factor with the development of melanoma **[2,3].** In 80% of the cases are reported as locally advanced. The prognosis will depend mainly on the nodal invasion, the depth (Breslow and Clark scale) and the presence of ulceration, as well as the mitotic index **[4].** Surgical resection with adequate margins is the mainstay of therapy to make a histologic diagnosis, that will contribute to the staging of the primary tumor and dictate the subsequent definitive management for the best outcomes. **[5,6].** The decision on the type of closure will depend on the extent of the excision, achieving adequate aesthetic results without tension in small defects by closing the subcuticular layer with absorbable material and reinforcement with full-thickness interrupted non-absorbable material. In large defects where the risk of recurrence is low and the margins are reported to be negative, the use of advancement flaps, complex rotational flaps and skin grafts can be decided **[7].** Among the treatments to cover large soft tissue deficits in the heel by using tissue from the foot itself, the reverse sural flap (RSAF) and the medial plantar flap (MPAF) are included, the latter being considered the standard reference in heel reconstruction **[8,9].** In the present case a 61-year-old female patient is reported with a heel wound, suggestive of melanoma to which an excisional biopsy was performed with a residual deficit of soft tissue of 5x5 cm which is covered with a medial plantar flap.

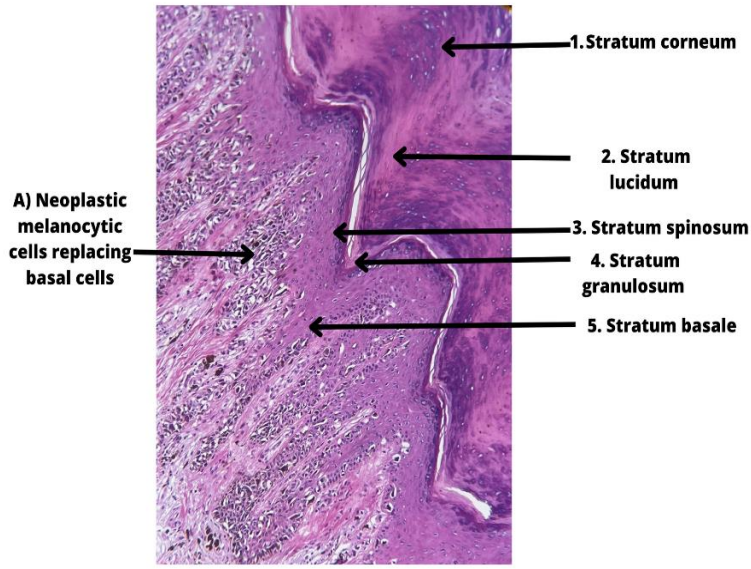
CLINICAL CASE

This is a 61-year-old female patient with a non-pathological personal history: Religion: Catholic, housewife, married, with elementary education. Personal pathological history of systemic arterial hypertension diagnosed in 2021, Surgeries: Bilateral tubal occlusion in 1997, Cholecystectomy opened in 2015, Obstetrics and Gynecology History: Pregnancies:4, Births:4, Menarche at 13, Menopause at 50. Her condition started 2 years ago with the presence of lesion of irregular brown colored edges of approximately 2 mm in the talar region of the left pelvic limb, increasing its radial volume progressively, with slight pain to ambulation, so he goes to means with unspecified medical treatment without improvement and subsequently referred to the surgical oncology consultation for evaluation.

On physical examination, flat lesion of irregular black-brown edges of 3 cm in diameter ulcerated at its center with clean and friable background is observed. **(Figure 1)**

(Figure 1) Suggestive lesion of melanoma on the skin of the left heel

Excisional biopsy of 5 x 5 cm is performed at 1 cm from the edges of the lesion, being sent to pathology during the trans-surgical, reporting ulcerated malignant melanoma of 3.5 cm of major axis that affects the reticular dermis (Clark level 4) with a Breslow thickness of 0.5 cm with lymphatic permeation present, not microsatellites surgical edges without lesion T1B Nx Mx**.**
(Figure 2).



(Figure 2) Histological section product of excisional biopsy of the left heel.

We proceed to cover by medial plantar flap and taking and applying partial thickness graft of posterior region of left thigh **(Figure 3) (Figure 4)** subsequently left inguinal radical lymphadenectomy**. (Figure 5).**

(Figure 3) Dissection of a medial plantar flap in the left pelvic limb

(Figure 4) Wound coverage in the region of the left heel with a medial plantar flap.

Subsequently as result of histopathology resulting from left radical lymphadenectomy: 5 – 6 lymph nodes with melanoma metastasis, the other with non-specific reactive mixed hyperplasia. Then sent to clinical oncology

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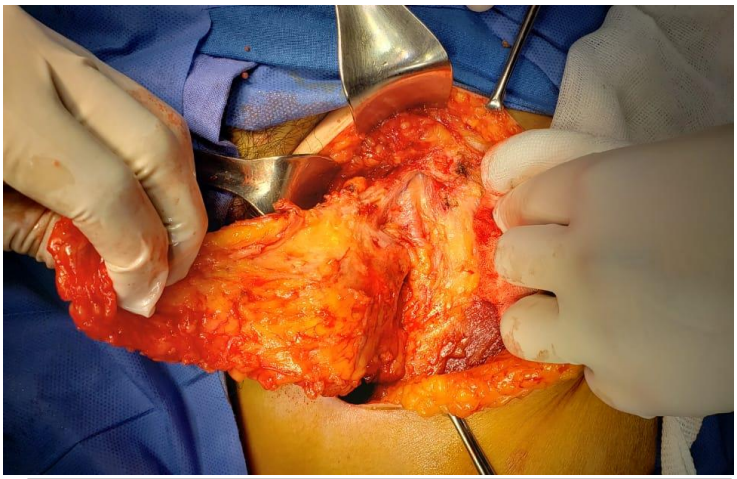

(Figure 5) Left inguinal Radical Dissection

Follow-up is performed by the external consultation showing adequate evolution of the heel reconstruction, adequately tolerating total ambulation 3 months after surgery **(Figure 6)** in addition to adequate wound healing by left inguinal radical lymphadenectomy. **(Figure 7)**

(Figure 6) Reconstruction of left heel with medial plantar flap 3 months after surgery.

(Figure 7) Surgical wound scar in left inguinal region by left inguinal radical lymphadenectomy 3 months after surgery.

DISCUSSION

About 30% of cutaneous melanomas appear in the lower extremities and 3-15% of these lesions are in the feet. Being an unusual location, at the time of diagnosis they are locally advanced with marked depth, ulceration and lymphovascular infiltration with a poor prognosis, and finally with a high recurrence compared with other sites **[10].** The initial treatment will be surgical through the performance of an excisional biopsy, that is not only focused on the diagnosis, but it also allows us the micro staging by histological providing us prognostic information and the choice of further therapy **[11].** Wide excisions of melanoma yield large soft tissue deficit, becoming a challenge when it comes to covering the defect by replacing with a similar tissue that is stable, durable, capable of withstanding great pressure and shear forces**.** Many reconstructive surgical options have been described to cover these defects. Coverage with the use of free flaps, as well as muscle flaps, provide an adequate volume of soft tissue and weight bearing surface; however, it requires a high degree of experience and infrastructure, making it very demanding and not viable. The use of reconstructive treatments with tissue from the same foot is preferred, performing tissue transfer with techniques such as the MPAF and RSAF, easy to perform and with adequate results.

The MPAF provides protective sensitivity through the medial plantar nerve in addition to covering an area of up to 6 x 9 cm. **[9, 12].** In a comparative cross-sectional study of the department of plastic surgery of the Tanta University Hospital that included 30 patients of both sexes in the age range of 18 to 60 years who presented foot and ankle defects from March 2011 to March 2014, the patients were divided into 2 equal groups: one group underwent with MPAF repair and the other RSAF. The MPAF was used for patients whose defects were <5 x7 cm, whose instep area of the sole of the foot was intact and The RSAF was used for patients whose defects were >5 x 7 cm. Both techniques provided adequate soft tissue coverage and durable skin, with MPAF being useful for moderate defects and RSAF for larger defects, however functional outcomes were significantly better in MPAF compared with RSAF allowing partial weight-bearing ambulation before 4 weeks in MPAF and RSAF after 4 weeks **[13]**. Coverage of residual foot defects after biopsy of melanoma is essential, considering coverage with MPAF ideal for this case.

CONCLUSION

Melanoma requires a biopsy in its initial management for a histological evaluation, which allows assessing the invasion of this tumor, requiring a broad excisional biopsy in cases of deep invasion, resulting in a large residual defect.

The area where the biopsy is taken will determine the ideal type of coverage, being useful from a primary closure to the implementation of flaps. The medial plantar flap, considered a standard for heel reconstruction, continues to give adequate results for the coverage of this area. In this case, adequate healing is shown, with little pain and with a functional covering tissue and with good aesthetic results.

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