

ORIGINAL ARTICLES

Full Thickness Skin Grafts Obtained From the Skin Overlying Sentinel Nodes

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Abstract. *Background.* Surgical treatment of skin melanoma with skin margins in accordance with tumor thickness often necessitates covering the surgical defect with full or partial thickness skin grafts. When selective sentinel node biopsy is indicated, traditional procedures require 3 incisions: 1 in the region of the primary tumor covered by the graft, 1 in the axilla or groin corresponding to the site of the selective sentinel lymphnode biopsy, and 1—almost always the most uncomfortable—in the donor site for the skin graft.

Patients and methods. We present 10 patients attended in our department who underwent an alternative technique to reduce the number of wounds. A full thickness skin graft was obtained from the axillary or inguinal region covering the sentinel node.

Results. Sentinel node biopsy was positive in 1 patient, who subsequently underwent inguinal lymphadenectomy. Only 1 mild postoperative complication was reported in a patient with partial graft loss. The mean hospital stay was 6.2 days. After follow-up ranging from 11 to 56 months, no local recurrences or metastases had been detected.

Conclusion. The technique we present has the advantage of further simplifying surgical treatment for melanoma. It reduces the problems associated with sentinel node dissection by affording a wider access and is also associated with less morbidity.

Key words: melanoma, sentinel lymph node, grafts.

INJERTOS DE PIEL TOTAL OBTENIDOS DE LA ZONA DEL GANGLIO CENTINELA

Resumen. *Introducción.* El tratamiento quirúrgico del melanoma cutáneo con unos márgenes adecuados al espesor del tumor va a hacer que, en ciertas localizaciones, sea frecuente tener que cubrir el defecto quirúrgico mediante injertos de piel total o parcial. Cuando haya que realizar biopsia selectiva del ganglio centinela (BSGC) con la técnica clásica el paciente tendrá tres heridas, una en la zona del primario cubierta por el injerto, otra en la axila o la ingle, por donde hemos hecho la BSGC, y otra, casi siempre la más molesta, en la zona dadora del injerto.

Material y métodos. Presentamos 10 pacientes tratados en nuestro Servicio en los que se realizó una técnica alternativa que redujo el número resultante de heridas. Para ello se obtuvo el injerto de piel total de la zona de la axila o de la ingle que recubría el ganglio centinela.

Resultados. La BSGC sólo fue positiva en un caso, al que se realizó linfadenectomía inguinal. Sólo se produjo una complicación postoperatoria leve en un paciente, con una pérdida parcial del injerto y la estancia hospitalaria media fue de 6,2 días. Después de un seguimiento variable entre 11 y 56 meses, no se han detectado casos de recidiva local ni de metástasis.

Conclusiones. La técnica que presentamos tiene la ventaja de que simplifica aún más el tratamiento quirúrgico del melanoma, reduce las dificultades en la disección del ganglio centinela al permitirnos una vía de abordaje más amplia y, además, disminuye la morbilidad asociada a la intervención.

Palabras clave: melanoma, ganglio centinela, injertos.

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Introduction

The treatment of skin melanoma in the initial stages is currently based on appropriate surgical treatment using standardized skin margins in accordance with tumor thickness. Excision with appropriate surgical margins can

cause defects that, in specific locations, and especially in the limbs, can be difficult to close and may even require dermo-epidermal or full-thickness skin grafts. These grafts add another factor to the comorbidity associated with the intervention.¹⁻³

In those cases in which the characteristics of the primary tumor indicate selective sentinel node biopsy and the skin melanoma is located on the limbs, the traditional technique requires 3 incisions: 1 in the region of the primary tumor covered by the graft, 1 in the axilla or groin corresponding to the selective sentinel node biopsy site, and 1 in the donor site for the skin graft. To reduce the number of wounds, it may be useful to obtain the full-thickness skin graft from the axilla or groin corresponding to the skin overlying the sentinel node, thereby simplifying the surgical technique and reducing the comorbidity associated with the intervention.

We present 10 patients treated with this technique in the Melanoma Unit of the Dermatology Department at the Hospital San Cecilio, Granada, Spain, and report the results obtained using this technique and its advantages.

Material and Methods

This was a retrospective study covering the period from December 2002 to June 2006. We analyzed 10 cases of patients with skin melanoma located on a lower limb, who underwent primary tumor excision, selective sentinel node biopsy, and repair of tissue loss using skin overlying the region of the sentinel node.

All patients underwent prior excision-biopsy and histological analysis confirmed the clinical diagnosis of skin melanoma, except for patient 2, who underwent excision of the primary tumor in a different center (and whose histological data were unobtainable), and patient 10, who attended our service for recurrence after "laser" therapy (as reported by the patient).

Once the diagnosis was confirmed, the primary tumor scar was resected again with margins determined according to the Breslow thickness (1 cm when Breslow thickness <1 mm and 2 cm if >1 mm), and the selective sentinel node biopsy was performed during the same operation. All the patients had previously undergone lymphangiography and sentinel node resection was performed under fluoroscopic guidance. Although selective sentinel node biopsy was indicated by Breslow thickness, in our department we also take into account the general clinical situation of the patient. The sentinel node was approached via a circular skin excision the size of the defect produced by resection of the primary tumor scar (Figure 1). The donor site was closed in layers, and the graft was cleaned and secured in the receptor area for 6 to 7 days, during which period the patients were kept in relative rest with the limb elevated.

During patient follow-up, the healing of the surgical wound was closely monitored during the immediate postoperative period and after the graft had stabilized. All the patients have been undergoing periodic examinations in our unit following the guidelines and complementary tests recommended by the Spanish Consensus Group on Melanoma.⁴

Results

The characteristics of the patients are summarized in the Table. Nine patients presented localized melanomas on a lower limb: 6 on the leg (mainly on the lower third) and 3 on the foot, whereas only 1 patient had the primary tumor on an upper limb, specifically, on the back of the hand. The sentinel node site was inguinal or axillary, depending on whether an upper or lower limb was affected. Thickness ranged from 0.6 mm to 6.5 mm, and the selective sentinel node biopsy was negative in all cases except in 1 patient, who subsequently underwent inguinal lymphadenectomy, and was negative in the 14 isolated nodes. Patient 9, whose melanoma had a Breslow thickness of 6.5 mm, underwent extensive preoperative examination that included positron emission tomography to rule out disseminated disease.

Hospital stay ranged between 2 and 11 days, with an average of 6.2 days. A postoperative complication was only observed in 1 patient, in whom the upper part of the graft deteriorated and partial necrosis occurred. This episode was resolved by minimal excision of the necrotic area and closure by second intention, with subsequent successful healing. The final outcome of the graft, both from a functional and esthetic standpoint, was very good in all cases, including the one which required partial excision (Figure 2).

To date, patient follow-up has ranged from 11 to 56 months, depending on the date of the intervention. During this period, no local recurrences have been reported. Likewise, no metastases have been detected in any of the patients.

Discussion

Several studies have established appropriate surgical margins in the treatment of skin melanoma.⁵⁻¹² The days are long gone when patients underwent what can only be described as mutilation in an attempt to increase survival. Current margins are based on tumor thickness measured in millimeters; thus margins of 1 cm are used for melanomas with a thickness less than 1-2 mm,⁵⁻⁹ and of 2 cm for those of over 2 mm.¹⁰⁻¹² Larger margins have no proven advantage regarding survival or recurrence, and



Figure 1. Intraoperative images of patient 3. A: Site where the sentinel node was found under fluoroscopic guidance. B: Detection and excision of the sentinel node through the defect left by the total skin graft. C: Result after excision of the sentinel node and defect closure. D: Result after securing on the leg the full thickness skin graft obtained from the sentinel node site.

Table 1. Characteristics of the Patients Included in the Series, Including Data on the Primary Tumor and Subsequent Outcome

| No. | Sex | Location | Age, y | Breslow, mm | Selective sentinel node biopsy | Complications | Hospital Stay, d | Recurrence | Metastasis | Follow-up, mo |
|-----|-----|----------|--------|-------------|--------------------------------|---------------------|------------------|------------|------------|---------------|
| 1 | M | Leg | 26 | 1.3 | Negative | No | 2 | No | No | 14 |
| 2 | F | Foot | 30 | NS | Negative | No | 8 | No | No | 11 |
| 3 | F | Leg | 25 | 2.5 | Negative | No | 7 | No | No | 11 |
| 4 | M | Foot | 70 | 2.5 | Negative | No | 7 | No | No | 13 |
| 5 | F | Foot | 25 | 0.9 | Negative | No | 8 | No | No | 15 |
| 6 | F | Hand | 44 | 0.9 | Negative | No | 4 | No | No | 18 |
| 7 | F | Leg | 21 | 0.9 | Negative | No | 3 | No | No | 22 |
| 8 | F | Leg | 59 | 1.6 | Positive | Graft deterioration | 11 | No | No | 55 |
| 9 | F | Leg | 55 | 0.6 | Negative | No | 8 | No | No | 56 |
| 10 | F | Leg | 22 | 6.5 | Negative | No | 4 | No | No | 56 |

Abbreviations: F, female; M, male; NS, not stated.

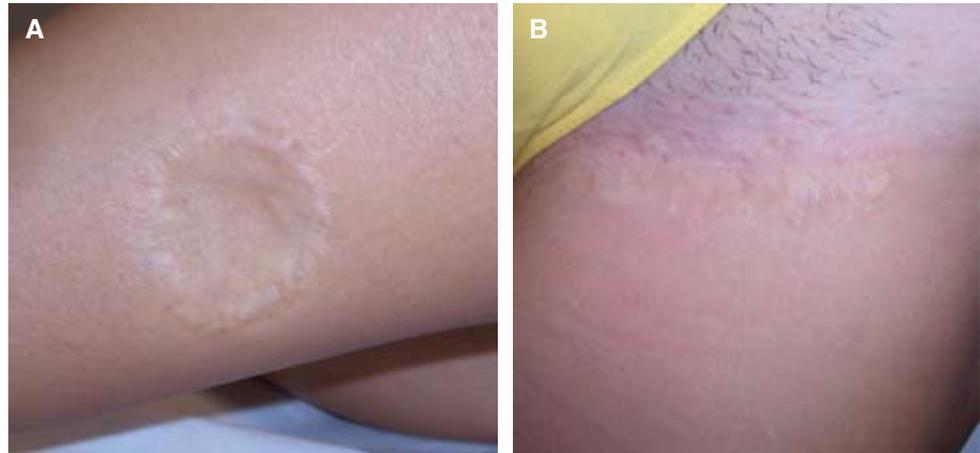


Figure 2. Esthetic outcome 1 year after the intervention in patient 3. A: Full thickness skin graft on the leg, with a color and texture very similar to the surrounding skin. B: Practically invisible lineal scar in the inguinal region.

thus are considered unnecessary. In terms of depth, the underlying fascia should be reached without excising it.¹³

If we apply these margins, if the primary tumor is large, the resulting defects may also be large. This means that at certain sites (especially the limbs) it may be difficult to achieve closure by first intention or by using advancement flaps, and partial or full thickness skin grafts may be needed.¹⁻³ These have some advantages, such as permitting better follow-up of possible local recurrence, but also have drawbacks, such as comorbidity associated with the need for a donor site (usually the thigh in our case) and a longer hospital stay. The use of full thickness skin grafts instead of dermo-epidermal grafts leads to a better esthetic result; on the one hand, the texture and color tend to be more similar to those of the recipient site, without the known “trapdoor effect,” and on the other, it avoids the need for creating a wound site (with a resulting scar) at the donor site.¹⁴ The most important limiting factor when performing a full thickness skin graft concerns closure or nonclosure of the donor site. This is not usually a problem in the case of skin covering the sentinel node in the groin, and closure can be achieved without major complications; furthermore, this skin tends to be sufficiently thick to minimize shrinkage of the graft in its final bed, leading to a better esthetic result. Closure can also be achieved in the axilla without difficulty.

Regarding morbidity, the use of full-thickness skin grafts only requires a few days of care until the stitches are extracted, whereas in the case of a partial thickness graft donor site, care should continue for several weeks until complete reepithelialization of the bed has occurred. Furthermore, in this case, hyperpigmentation or persistent erythemas frequently appear in the site, and often take months or years to heal.

No objective data are available on the possible influence of this technique on survival, since to date no

comparative studies have been conducted with partial skin grafts. In principle, the use of full thickness skin grafts or advancement flaps does not negatively affect survival or increase local recurrences compared to the use of thinner grafts.^{7,14} However, only 3 studies have reported the outcomes of the use of this technique—all in a small series of patients. In a series of 16 patients, Dresler et al¹ did not observe increased recurrence on the graft or metastasis at the donor site. These findings were confirmed by Chennoufi et al² in a more recent series of another 16 subjects. In the largest and most recent series, Lewis et al³ included patients with melanoma and other tumors (Merkel cell tumor, basal cell carcinoma, and squamous cell carcinoma). Likewise, these authors did not observe any significant differences in the rate of recurrences in the full thickness skin graft group compared to the partial graft group. We did not observe cases of local recurrence or metastasis in any of our patients, but the study included a small series of cases; thus, long-term studies with more patients are needed to be able to more accurately assess any possible impact on survival or recurrences.

The technique presented has the advantage of simplifying yet further the surgical treatment of skin melanoma, decreasing the difficulties involved in sentinel node dissection by providing wider access and, in addition, decreasing the comorbidity associated with the intervention. Thus, we consider that the use of full-thickness skin grafts from the sentinel node site may be a good choice in certain patients, leading to better esthetic and functional results, without adversely affecting the oncological outcome while decreasing the morbidity associated with the procedure.

Conflicts of Interest

The authors declare no conflicts of interest.

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