



**Fig. 5.**  
Final appearance of the urogenital region after 3 months.

functional and aesthetic results [3]. In case of more extensive defects involving both scrotal and perineal skin loss, we favor split thickness skin grafts for defect coverage. As noted by Huettinger et al. [1], graft fixation remains a challenge. We have developed a VAC fixation technique, the so-called “sandwich technique” [4], that we have used successfully for many years now. We feel that it is well worth sharing with the reader, given its ease of application and superior outcome. We would like to present an illustrative case:

A 47-year-old male was referred to our institution after debridement in the scrotal and perineal area for treatment of Fournier’s gangrene in another hospital (Fig. 1). Defect coverage was carried out using bilateral gracilis muscle flaps rotated by 180 degrees around their proximal pedicles. Immediate coverage of the muscle flaps was performed by split-thickness skin grafts (Fig. 2), which were fixed immediately by the aforementioned “sandwich technique” (Figs. 3, 4). The final outcome 3 months postoperatively is shown in Fig. 5.

We agree with Huettinger et al. [1] that VAC fixation in the perineal area provides all-important factors for excellent graft take. With our alternative fixation method, the risk of shearing and tearing forces on the grafts leading to graft loss may be minimized. Our clinical results support this finding.

## References

1. Huettinger P, Dunst-Huemer KM, Huemer GM. The VAC-Basket for easy fixation of scrotal skin grafts. *Arch Plast Surg* 2012;39:667-8.
2. Bamji A. Sir Harold Gillies: surgical pioneer. *Trauma* 2006;8:143-56.
3. Djedovic G, Rieger UM, Skradski V, et al. Re: Scrotal reconstruction by testicular apposition and wrap-around skin grafting. *J Plast Reconstr Aesthet Surg* 2011;64:1392-3.
4. Djedovic G, Engelhardt TO, Rieger UM, et al. The sandwich technique for vacuum-assisted wound dressing application in the urogenital region: a safe, time-sparing and reliable method. *Singapore Med J* 2012;53:294-5.

## Hidden Sentinel Node in Cutaneous Melanoma

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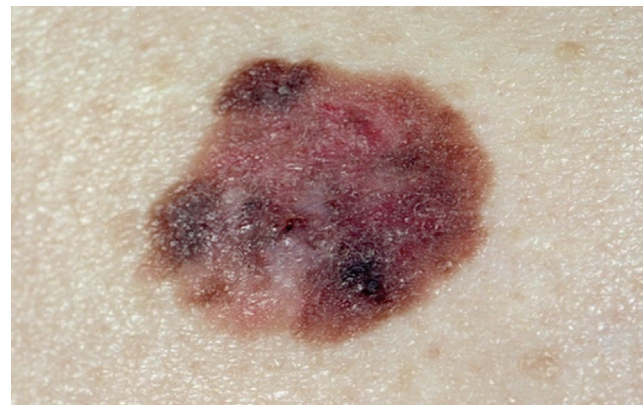
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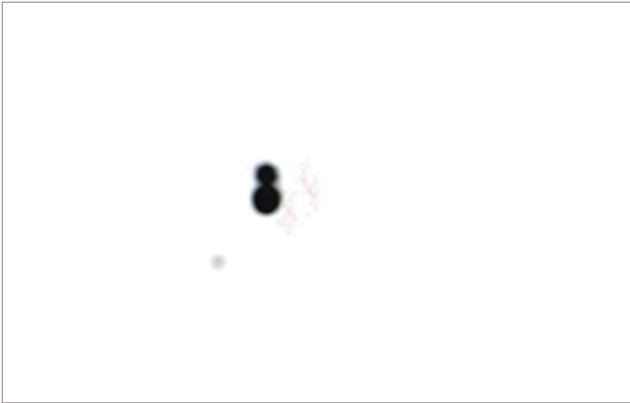
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Sentinel lymph node (SLN) biopsy is a well-established staging method for melanomas. Several techniques have been described to identify the first lymph node receiving lymphatic flow from the primary tumor. Injection of <sup>99m</sup>Tc-nanocolloid into the tumor bed followed by lymphoscintigraphy provides a road map for the surgeon. However, in a variable percentage of cases, the sentinel node may remain undiscovered during this procedure [1]. This problem is well-known with regard to the identification of lymph nodes in the head and neck, where the complex anatomy as well as the presence of vital structures renders lymphatic mapping a challenging procedure [2].

Hence, we would like to share our experience in this field by describing the case of a 40-year-old woman who was referred to our department for a 1.33-mm-thick melanoma of the upper external quadrant of the left breast (Fig. 1). Previous surgical excision had been followed by histopathologic analysis reporting an infiltrating



**Fig. 1.**  
Melanoma of the upper external quadrant of the left breast.



**Fig. 2.**

Lymphoscintigraphy of the patient with an image at 10 minutes after the injection of the radiopharmaceutical. No hot spot could be identified as a sentinel lymph node.

cutaneous melanoma with vertical growth and a mitotic index=2, and without ulceration.

As a consequence, the patient underwent lymphoscintigraphy (Fig. 2). Planar imaging of the thorax was performed 10 minutes, 30 minutes, and 2 hours and 4 hours after the injection of the radiopharmaceutical. No hot spot could be identified as a sentinel lymph node. Hence, lymphoscintigraphy was postponed for two weeks but, again, neither lymphatic drainage nor a sentinel lymph node was shown. One day later, intraoperatively, a  $\gamma$ -ray detection probe (Navigator, USSC, Norwalk, CT, USA) was used through the intact skin to check the axilla. No radioactivity was found and, in consultation with our institution's oncologists, axillary lymphadenectomy was planned. Widening of the margins was performed, and the hand-held gamma probe was subsequently inserted into the resulting defect (Fig. 3). Radioactivity was found on the deep upper portion of the defect. An accurate dissection, guided by a gamma probe, was performed, and one radioactive node was removed. After removal of the sentinel node, the wound showed no further radioactivity. As a consequence, lymphadenectomy was not performed. Histological analysis of the sentinel node showed the presence of metastatic cells.

Sentinel node biopsy was first introduced in melanoma patients in 1992 [1]. Since this initial experience, several techniques have been described to identify the first node receiving lymphatic flow from the primary tumor. Preoperative mapping by mean of lymphoscintigraphy has become of paramount importance in melanoma patients due to the unpredictability of lymphatic drainage patterns [3]. However, there are some reports in the literature describing its failure in identifying the SLN. Jansen and colleagues showed that the predicted number of sentinel nodes detected with lymphoscintigraphy was accurate in only 81% of lymph node fields and that its limited discriminating power was the most frequent reason for discrepancies with surgical findings [1]. Hidden sentinel nodes have also been reported in breast cancer patients. Several techniques have been suggested to address this problem, such as delayed imaging, re-injection of



**Fig. 3.**

Preoperative image of the patient undergoing widening of the margins of the previous melanoma excision. Left oblique view of the breast with the scar of the previous melanoma excision.

the radiopharmaceutical, post-injection massage, injection of saline around the tumor, and hybrid single-photon emission computed tomography/computed tomography (SPECT/CT) scan.

In our patient, no sentinel node was shown by lymphoscintigraphy. Two reasons were hypothesized to be responsible for this finding: disruption of the lymphatic drainage induced by surgical excision or concealment of the axillary sentinel node behind the injected radioactivity. Intraoperatively, the latter proved to be true, thus overcoming the need for primary lymphadenectomy.

Lymphoscintigraphy is an important guide for sentinel node biopsy, but it may sometimes fail to provide an adequate road map for the surgeon, as in our patient. In such cases, multi-directional scintigraphic views must be considered, in order to detect hot nodes concealed by the injection site, as described for axillary nodes in breast cancer of the upper lateral quadrant [4]. The intraoperative use of blue dye and/or a gamma probe is of paramount importance to compensate for the limitations of scintigraphy, thus allowing the surgeon to perform an oncologically adequate procedure and to spare the patient primary or wrong-site lymphadenectomy.

However, the use of blue dye may produce adverse effects, such as urticaria, hypotension, and bronchospasm, and may have marginal benefits, as described by Lingam et al. [5].

As a consequence, intraoperative gamma probing remains a mainstay in cases of hidden nodes or false-negative scintigraphic findings.

## References

1. Jansen L, Nieweg OE, Kapteijn AE, et al. Reliability of lymphoscintigraphy.

- tigraphy in indicating the number of sentinel nodes in melanoma patients. *Ann Surg Oncol* 2000;7:624-30.
2. Brouwer OR, Klop WM, Buckle T, et al. Feasibility of sentinel node biopsy in head and neck melanoma using a hybrid radioactive and fluorescent tracer. *Ann Surg Oncol* 2012;19:1988-94.
  3. Staius Muller MG, Hennipman FA, van Leeuwen PA, et al. Unpredictability of lymphatic drainage patterns in melanoma patients. *Eur J Nucl Med Mol Imaging* 2002;29:255-61.
  4. Koizumi M, Nomura E, Yamada Y, et al. Improved detection of axillary hot nodes in lymphoscintigraphy in breast cancer located in the upper lateral quadrant with additional projection imaging. *Ann Nucl Med* 2004;18:707-10.
  5. Lingam MK, Mackie RM, Mackay AJ. Intraoperative lymphatic mapping using patent blue V dye to identify nodal micrometastases in malignant melanoma. *Reg Cancer Treat* 1994;7:144-6.