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Free flap reconstruction for melanoma of the head and neck: indications and outcomes

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KEYWORDS

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Summary *Introduction:* Occasionally, patients present with locally advanced melanoma of the head and neck involving deeper structures or with bulky local recurrence in regions with pre-existing surgical scars or previous irradiation. In these circumstances surgery may offer the only likely chance of local disease control and reconstruction of the ablation defect may require microvascular reconstruction. The primary aim of this study was to assess whether there was any evidence that adopting an aggressive surgical approach provided a survival benefit for these patients.

Methods: A retrospective analysis of 16 patients from the Sydney Head & Neck Cancer Institute database was performed. A matched pair analysis using patients from the Sydney Melanoma Unit database comparing disease-specific survival was performed.

Results: There were thirteen patients with cutaneous melanoma and three with mucosal melanoma. Thirteen patients (82%) required a bone resection and nine of these (70%) required skull base resections. Seven muscle flaps and nine fasciocutaneous flaps were performed. The free flap success rate was 94% (15/16).

The overall survival was 69% and the disease free survival was 46% (median follow-up: 16 months). There was a 44% (71% v 27%) increase in stage-matched, disease-specific survival of the free flap group compared to the control group at three years ($p = 0.06$: hazard ratio for death 0.26 (0.08–1.0)).

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Conclusions: For carefully selected patients with locally advanced melanoma of the head and neck an aggressive surgical approach, including radical resection and reconstruction with free tissue transfer, may be indicated to provide disease control and short-term survival benefit.
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Melanoma commonly arises on the head or neck, with a greater risk of recurrence and a worse prognosis than for melanoma arising in other body regions.^{1,2} Current treatment guidelines recommend that the definitive surgical treatment of an invasive melanoma should be by wide local excision, usually with a 1 cm or 2 cm margin depending on the maximum Breslow thickness of the primary tumor.³ Of principal importance in the reconstruction of excision defects of the head and neck is the proximity to critical structures such as the nose, eyes and mouth. Where primary closure is not possible, the rich vascular supply to the head and neck makes local reconstructive options the most attractive for providing satisfactory cosmesis.⁴

Occasionally, patients present with advanced primary disease, especially in less visible areas such as the scalp or mucosal regions^{5,6}; this may involve deeper structures such as underlying muscle, periosteum or bone. Others may present with bulky local recurrence in regions with pre-existing surgical scars or previous irradiation. In these circumstances, where a large or composite reconstruction with reliable vascularity is needed, microvascular reconstruction may offer a solution. Patients with advanced local disease or recurrences usually have a poor prognosis² and, since proven effective adjuvant therapy currently remains elusive, surgery provides the best chance of providing effective local control.

The aim of this study was to assess whether there was any evidence that adopting an aggressive surgical approach to these patients provided a survival benefit. A further aim was to evaluate the effectiveness of free tissue transfer for reconstruction and for local disease control in the treatment of locally advanced melanoma of the head and neck.

Methods

An extensive search of the Sydney Head & Neck Cancer Institute database was performed and sixteen patients out of a total of 8150 (0.2%) were identified in a period extending from 1988 to 2007. The inclusion criteria for this retrospective study were any patient with melanoma of the head and neck that was treated by reconstruction of the excision defect with a free tissue transfer. Any stage of the disease and any subtype of melanoma (cutaneous, mucosal and ocular) were accepted. Some patients received more than one free tissue transfer on separate occasions. This did not exclude them from the study but only the first reconstruction was analysed for statistical purposes. Details of the patients and the operations they received were retrieved from the case records and data pertaining to the histopathology of both the primary lesion and the operative specimen were obtained from the anatomical pathology electronic records. The dates of the

last known follow-up and the status of the patient at that time were obtained from the case records.

The Sydney Melanoma Unit (SMU) database was consulted to match patients of the same sex with a similar age (tolerance +/– five years), similar primary site location, and identical stage. Where possible, the date of diagnosis was also matched within a tolerance of five years. The matching was performed by one investigator (MM) who was blinded to the follow-up status of both the experimental and control patients. In the event that more than one control patient was suitable then the patient with the closest age was chosen. All of the patients in the experimental cohort had advanced disease and, to avoid lead-time bias, the follow-up dates of the SMU patients were chosen from time of diagnosis of matching stage rather than time of diagnosis of primary.

Statistical analysis was performed using a combination of software packages, namely SPSS v.11 (SPSS Inc. USA), GraphPad Prism v.4 (USA) and Excel (Microsoft Corp USA). Kaplan-Meier log-rank analysis was used to construct and compare survival curves. Primary end-points were recurrence rates and disease-free survival for the follow-up data in addition to a descriptive analysis of the surgical and demographic data.

Results

Table 1 summarises the patients and their presenting problems. The majority of the patients were male ($n = 12$, 75%) and the median age of the cohort was 64 years (range 39–85).

There were three patients (19%) with mucosal melanoma primaries (2 ethmoid sinus and 1 buccal). The median Breslow thickness of the cutaneous primary lesions was 2.8 mm (0.72–18 mm) and 90% were T-stage 3 or 4. Seven cases (54%) were of the desmoplastic/neurotropic subtype. Three patients presented at the time of the initial diagnosis of their melanoma (2 mucosal and 1 cutaneous). For the remainder of the cohort, the median time from diagnosis of the primary melanoma to free flap reconstruction was 5.3 years. The majority of patients (12/16 – 75%) had undergone surgery for locoregional recurrence prior to the episode that was treated with a free-flap. The median number of previous procedures was 2 (range 1–8). Eight patients had undergone surgery for in transit metastases and 4 patients had undergone a formal cervical lymphadenectomy. Seven patients (44%) had received radiotherapy to the head and neck region on a previous occasion for advanced or high-risk melanoma.

The surgery performed on each patient is outlined in **Table 2**. A total of thirteen patients (82%) required a formal bone resection and nine (70%) of these were for disease at the skull base. A formal selective neck dissection was

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