

Head and Neck Malignant Melanoma

Local Recurrence Rate Following Wide Local Excision and Immediate Reconstruction

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Abstract: Excision of head and neck melanoma is often limited by critical structures, which can lead to incomplete excision with positive pathologic margin and increased local recurrence rate. Complete excision with recommended margins and immediate reconstruction is possible when surgical oncologists and plastic surgeons work collaboratively. Our purpose was to evaluate local recurrence rate after excision and immediate reconstruction. We reviewed 98 consecutive patients treated for primary head and neck cutaneous melanoma at a single institution between 1999 and 2004. We assessed local recurrence rate. A total of 72 patients (73%) were followed for an average of 5.2 ± 1.7 years while 26 patients were excluded due to less than 1 year of follow-up. Adjacent tissue transfer was the most common reconstruction (87%). Local recurrence was reported in 2.8% and distant metastasis in 12.5% of patients. Immediate reconstruction after excision of head and neck melanoma can be safely performed with low local recurrence rate.

Key Words: melanoma, reconstruction, timing, immediate, local recurrence, head and neck, adjacent tissue transfer

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The incidence of cutaneous melanoma has increased dramatically over the past 3 decades, and a significant number (approximately 20%) of these tumors are found on the head and neck.^{1–5} The standard treatment of melanoma is wide local excision (WLE) with a gross margin of uninvolved surrounding tissue. The recommended gross surgical margins are 1 cm for T1 tumors (≤ 1 mm in thickness)^{6,7} and 2 cm for T2 (1.01–2 mm), T3 (2–4 mm), and T4 (>4 mm) tumors.^{4,8–10} These margins may result in loss of function and disfigurement of critical head and neck structures such as the eyelid, ear, nose, or lip. Fear of damage or disfigurement of these structures may bias surgeons to excise narrower margins on the head and neck with resultant incomplete excision.¹¹ Incomplete excision may contribute to treatment failure with the relatively increased rates of local recurrence in the head and neck when compared with the trunk and extremities (4%–19% vs. 0.9%–6.3%, respectively).^{12–17}

Low rate of positive margin and superior aesthetic results can be obtained when surgical oncologists and plastic surgeons work closely together in planning and executing the WLE and reconstruction.¹⁸ The timing of reconstruction (immediately after excision without review of pathology versus delayed until after review of

final permanently fixed pathology) must be carefully coordinated. Immediate reconstruction after WLE for skin cancer remains controversial. Nevertheless, we have previously shown that the recommended margins of tissue can be excised, clear margins obtained, and immediate reconstruction using adjacent tissue transfer can be safely and reliably performed.^{3,18} The objective of our study was to determine the rate of local recurrence after WLE and immediate reconstruction for cutaneous head and neck malignant melanoma.

METHODS

After receiving approval from the Human Subjects Internal Review Board, we performed a retrospective review of all consecutive patients with primary head and neck cutaneous malignant melanoma who underwent WLE and immediate reconstruction at one tertiary referral center between 1999 and 2004. We culled medical records and made phone calls to patients to obtain follow-up information. Data collected included the following: patient demographics, melanoma type (superficial spreading, lentigo maligna, nodular, desmoplastic, not otherwise specified on pathology reports, in situ), anatomic location, thickness, ulceration, operative date, reconstruction type (primary closure, skin graft, or adjacent tissue transfer), local recurrence, morbidity, mortality, and duration of follow-up. Melanoma thickness was measured in millimeters as defined by Breslow¹⁹ and classified by TNM stage as defined by the American Joint Committee on Cancer, 7th Edition, (Tis [in situ], T1 [≤ 1.0 mm], T2 [1.01–2.0 mm], T3 [2.01–4.0 mm], and T4 [>4.0 mm]).²⁰

RESULTS

Ninety-eight consecutive patients were treated with WLE and immediate reconstruction for primary head and neck cutaneous malignant melanoma during this 5-year period. Of 98 patients, 72 (73%) with long-term follow-up (mean = 5.2 ± 1.7 years) were included in this assessment; patient and melanoma characteristics are presented in Table 1. Adjacent tissue transfer was the most common form of reconstruction (87%). Superficial spreading and nodular were the most common types of cutaneous melanoma (Fig. 1). Tumors were distributed throughout the head and neck, with the most common anatomic location being the cheek, followed by the scalp (Fig. 2). Of the 98 patients, 26 (27%) with less than 1-year follow-up were excluded. Of these 26 patients, 3 were known to have metastatic disease at the time of WLE and reconstruction and died within 1 year of their operation, 5 patients died of unrelated disease (eg, primary non-melanoma lung cancer, stroke) within 1 year of their operation, and 18 patients, while last reported to be free of local recurrence (mean follow-up = 105 days, range = 1 to 312 days), could not be reached by phone and were lost to follow-up. The 30-day postoperative mortality rate was 0%.

Local recurrence was found in 2 of 72 patients (2.8%) after WLE and immediate reconstruction. A 74-year-old man with a 4.1-mm thickness ulcerated tumor of the forehead (melanoma type not specified, T4bN0M0) underwent WLE and adjacent tissue transfer. Postoperatively, a positive margin with melanoma in situ was

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TABLE 1. Characteristics of Patients and Tumors

Characteristic	Patients n = 72 (%)
Gender (female:male)	28:44 (39:61)
Age at operation (yr)	
Mean ± SD	67 ± 57
Range	18–89
Breslow thickness (millimeters)	
Mean ± SD	1.9 ± 1.8
Range	0–10
Tumor stage*	
Tis	3 (4)
T1	30 (42)
T2	14 (19)
T3	18 (25)
T4	7 (10)
Reconstruction type	
Primary closure	2 (3)
Skin graft	7 (10)
Adjacent tissue transfer	63 (87)
Duration of follow-up (yr)	
Mean ± SD	5.2 ± 1.7
Range	1.4–8.0

*American Joint Committee on Cancer, 7th Edition, (Tis [in situ], T1 [≤1.0 mm], T2 [1.01–2.0 mm], T3 [2.01–4.0 mm], and T4 [≥4.0 mm]).

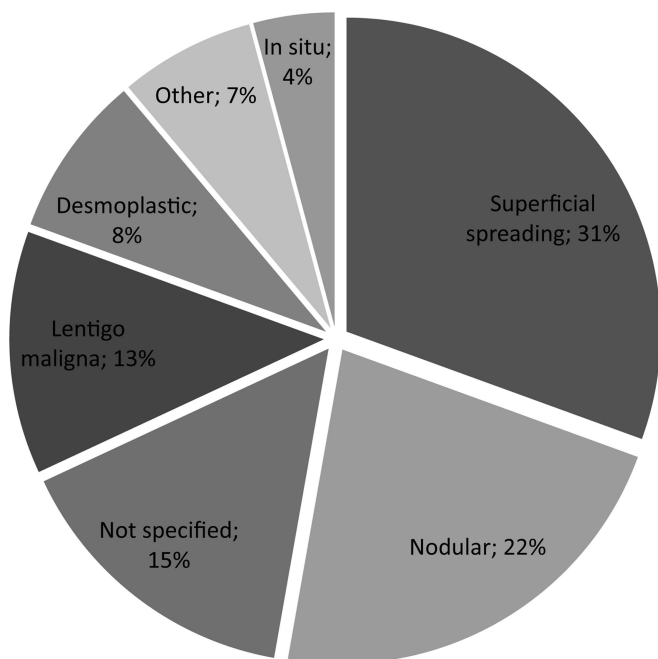


FIGURE 1. Distribution of primary cutaneous malignant melanoma by type.

noted on permanent pathology. Re-excision with wider margins was performed and adjacent tissue was readvanced for reconstruction. Despite wider re-excision, a positive margin with melanoma in situ persisted due to a diffuse field defect. The patient was followed closely and invasive melanoma was diagnosed 15 months later;

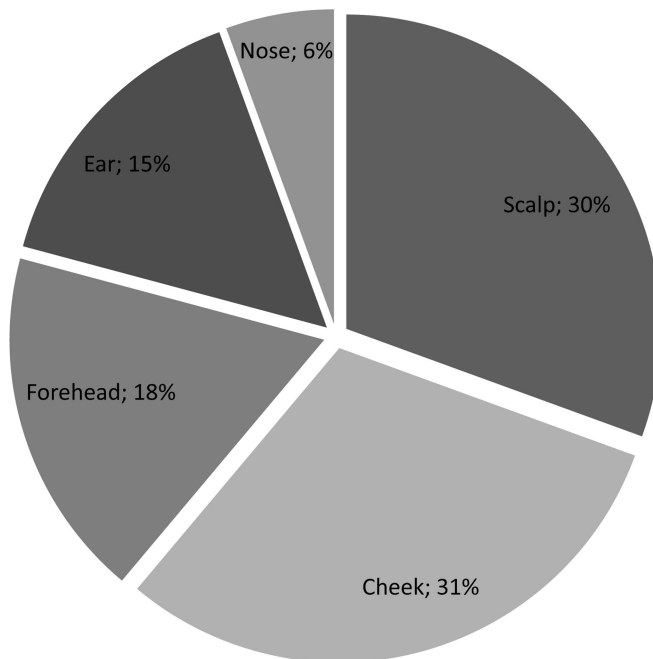


FIGURE 2. Anatomic distribution of primary cutaneous malignant melanoma on the head and neck.

another WLE was performed at the patient’s local hospital. The other patient with local recurrence was a 78-year-old man with a 0.6-mm thickness ulcerated tumor of the scalp (melanoma type not specified, T1bN0M0). WLE and full thickness skin grafting was performed; negative margins were obtained. Nevertheless, 19 months later, local recurrence was discovered. He underwent re-excision and reconstruction with a skin graft delayed until negative margins were confirmed by permanent pathology. To date, he remains free of local recurrence.

Regional or distant recurrence was found in 9 of 72 patients (12.5%) after WLE and immediate reconstruction. Regional lymph node metastasis was discovered at the time of initial WLE and sentinel node biopsy in 5 of these patients and, despite cervical lymph node neck dissection, distant metastasis ensued. The remaining 4 patients initially had no evidence of regional lymphatic spread (T1aN0Mx; T2aN0Mx; T2aN0Mx; T2bN0Mx) or subsequent local recurrence, but were diagnosed with metastatic melanoma at a mean of 3.1 ± 0.9 years following initial WLE.

DISCUSSION

We reviewed 98 consecutive patients treated with immediate reconstruction after WLE of primary head and neck cutaneous melanoma. Timing of reconstruction (immediate vs. delayed) following WLE of melanoma is debated. Concern for risk of positive margin and high local recurrence rate leads many surgeons to delay reconstruction. We have previously reported a low risk of positive margin with WLE and immediate reconstruction of head and neck melanoma.¹⁸ In this long-term follow-up, we confirm the safety of immediate reconstruction and present a low rate of local recurrence (2.8%) of head and neck cutaneous melanoma when compared with previous reports of 4% to 19%.^{12–17}

We attribute the low rate of local recurrence in this series of patients to a close working relationship between surgical oncologists and plastic surgeons. With knowledge that a plastic surgeon is available to perform immediate, functional, and aesthetically acceptable reconstruction of critical structures of the

head and neck (eg, eyelid, lip, nose), the surgical oncologist can excise the recommended margin with less concern for disfigurement or loss of function. This same model of care has become the standard for many patients with breast malignancy.²¹ Nevertheless, many surgeons continue to prefer delayed reconstruction for cutaneous malignancy.

Surgeons often rely on delayed skin grafting after WLE of head and neck melanoma due to concern for surveillance of subsequent local recurrence.^{22–28} Adjacent tissue transfer after WLE of melanoma, the most common form of reconstruction in our series, does not adversely affect the ability to treat cancer nor delay the detection of local recurrence, and may even decrease local recurrence rates by allowing a more complete resection.^{3,29–33} Further, complete tumor resection may expose bone, cartilage, or other tissues that typically will not accept a skin graft. Compared with skin grafting, adjacent tissue transfer provides like tissue for a reliable and superior functional and aesthetic result.

Immediate reconstruction should be approached with caution in some patients. Patients with locally recurrent, ulcerated, and desmoplastic melanoma have a higher risk of positive margin following WLE.^{11,18} In this review, both patients who developed local recurrence had ulcerated primary lesions. Higher rates of inadequate excision and recurrence have also been noted in other types of locally recurrent head and neck carcinoma.^{24,34} We continue to suggest treating locally recurrent melanoma with the recommended wide excision margins and reconstruction delayed until final pathology is reviewed and margins are known to be clear of melanoma.

Rates of regional and distant recurrence are variable based on melanoma stage and reports are not easily comparable due to heterogeneous patient populations. Head and neck and trunk primary melanoma is known to have a higher risk of metastatic recurrence than lesions on the extremities.³⁵ Recurrence after therapeutic lymphadenectomy in the head and neck region has been reported to be as high as 44% to 50% at 2 years.^{36–38} Our finding of 12.5% metastatic recurrence is similar to the 13% rate found by Ringborg et al.¹⁷

We acknowledge limitations in our study. The loss of follow-up in 18 patients can contribute to selection bias and underestimation of local recurrence rate. The large and remote geographic area served by some tertiary referral centers prevents some patients from returning for follow-up. The low rate of local recurrence prevents multivariable statistical analyses to identify independent clinical predictors of local recurrence after WLE and immediate reconstruction. The 2 patients with local recurrence had ulcerated primary tumors, but a larger multicenter series could help distinguish among variables associated with local recurrence in the head and neck following WLE and immediate reconstruction.

CONCLUSION

In summary, we present long-term follow-up in a series of patients treated with immediate reconstruction after WLE of primary head and neck cutaneous melanoma. We demonstrate a low rate of local recurrence (2.8%), further supporting the safety of immediate reconstruction when surgical oncologists and plastic surgeons work closely together in treating patients with head and neck cutaneous melanoma.

REFERENCES

- Davidsson A, Hellquist HB, Villman K, et al. Malignant melanoma of the ear. *J Laryngol Otol*. 1993;107:798–802.
- Jemal A, Siegel R, Xu J, et al. Cancer Statistics, 2010. *CA Cancer J Clin*. 2010;60:277–300.
- Lent WM, Ariyan S. Flap reconstruction following wide local excision for primary malignant melanoma of the head and neck region. *Ann Plast Surg*. 1994;33:23–27.

- Medina JE, Ferlito A, Brandwein MS, et al. Current management of cutaneous malignant melanoma of the head and neck. *Acta Otolaryngol*. 2002;122:900–906.
- Stadelmann WK, McMasters K, Digenis AG, et al. Cutaneous melanoma of the head and neck: advances in evaluation and treatment. *Plast Reconstr Surg*. 2000;105:2105–2126.
- National Institutes of Health Consensus Development Conference Statement on Diagnosis and Treatment of Early Melanoma, January 27–29, 1992. *Am J Dermatopathol*. 1993;15:34–43; discussion 46–51.
- Veronesi U, Cascinelli N, Adamus J, et al. Thin stage I primary cutaneous malignant melanoma: comparison of excision with margins of 1 or 3 cm. *N Engl J Med*. 1988;318:1159–1162.
- Balch CM, Urist MM, Karakousis CP, et al. Efficacy of 2-cm surgical margins for intermediate-thickness melanomas (1 to 4 mm). Results of a multi-institutional randomized surgical trial. *Ann Surg*. 1993;218:262–267; discussion 267–269.
- Heaton KM, Sussman JJ, Gershenwald JE, et al. Surgical margins and prognostic factors in patients with thick (>4 mm) primary melanoma. *Ann Surg Oncol*. 1998;5:322–328.
- Narayan D, Ariyan S. Surgical management of the primary melanoma. *Clin Plast Surg*. 2000;27:409–419, viii–ix.
- Kozlow JH, Rees RS. Surgical management of primary disease. *Clin Plast Surg*. 2010;37:65–71.
- Berdahl JP, Pockaj BA, Gray RJ, et al. Optimal management and challenges in treatment of upper facial melanoma. *Ann Plast Surg*. 2006;57:616–620.
- Fincher TR, O'Brien JC, McCarty TM, et al. Patterns of drainage and recurrence following sentinel lymph node biopsy for cutaneous melanoma of the head and neck. *Arch Otolaryngol Head Neck Surg*. 2004;130:844–848.
- Karakousis CP, Balch CM, Urist MM, et al. Local recurrence in malignant melanoma: long-term results of the multiinstitutional randomized surgical trial. *Ann Surg Oncol*. 1996;3:446–452.
- Leong SP, Accortt NA, Essner R, et al. Impact of sentinel node status and other risk factors on the clinical outcome of head and neck melanoma patients. *Arch Otolaryngol Head Neck Surg*. 2006;132:370–373.
- O'Brien CJ, Coates AS, Petersen-Schaefer K, et al. Experience with 998 cutaneous melanomas of the head and neck over 30 years. *Am J Surg*. 1991;162:310–314.
- Ringborg U, Afzelius LE, Lagerlof B, et al. Cutaneous malignant melanoma of the head and neck. Analysis of treatment results and prognostic factors in 581 patients: a report from the Swedish Melanoma Study Group. *Cancer*. 1993;71:751–758.
- Sullivan SR, Scott JR, Cole JK, et al. Head and neck malignant melanoma: margin status and immediate reconstruction. *Ann Plast Surg*. 2009;62:144–148.
- Breslow A. Thickness, cross-sectional areas and depth of invasion in the prognosis of cutaneous melanoma. *Ann Surg*. 1970;172:902–908.
- Edge SB, Byrd DR, Compton CC, et al. *AJCC Cancer Staging Manual*. New York, NY: Springer; 2010.
- Kronowitz SJ, Kuerer HM, Buchholz TA, et al. A management algorithm and practical oncoplastic surgical techniques for repairing partial mastectomy defects. *Plast Reconstr Surg*. 2008;122:1631–1647.
- Bumsted RM, Panje WR, Ceilley RI. Delayed skin grafting in facial reconstruction. When to use and how to do. *Arch Otolaryngol*. 1983;109:178–184.
- Ceilley RI, Bumsted RM, Panje WR. Delayed skin grafting. *J Dermatol Surg Oncol*. 1983;9:288–293.
- Egloff DV, Bosse JP, Papillon J, et al. Immediate flap reconstruction after excision of basal cell carcinoma of the face. *Ann Plast Surg*. 1979;3:28–34.
- Escobar V, Zide MF. Delayed repair of skin cancer defects. *J Oral Maxillofac Surg*. 1999;57:271–279; discussion 279–280.
- Eshima I. The role of plastic surgery in the treatment of malignant melanoma. *Surg Clin North Am*. 1996;76:1331–1342.
- Harris MN, Roses DF, Culliford AT, et al. Melanoma of the head and neck. *Ann Surg*. 1975;182:86–91.
- Thomas JR, Frost TW. Immediate versus delayed repair of skin defects following resection of carcinoma. *Otolaryngol Clin North Am*. 1993;26:203–213.
- Bogle M, Kelly P, Shenaj J, et al. The role of soft tissue reconstruction after melanoma resection in the head and neck. *Head Neck*. 2001;23:8–15.
- Cuono CB, Ariyan S. Versatility and safety of flap coverage for wide excision of cutaneous melanomas. *Plast Reconstr Surg*. 1985;76:281–285.
- Evans GR, Williams JZ, Ainslie NB. Cutaneous nasal malignancies: is primary reconstruction safe? *Head Neck*. 1997;19:182–187.

32. Frokiaer E, Kiil J, Sogaard H. The use of skin flaps in the treatment of malignant melanomas in the head and neck region. *Scand J Plast Reconstr Surg*. 1982;16:157–161.
33. Narayan D, Ariyan S. Surgical considerations in the management of malignant melanoma of the ear. *Plast Reconstr Surg*. 2001;107:20–24.
34. Bumsted RM, Ceilley RI, Panje WR, et al. Auricular malignant neoplasms. When is chemotherapy (Mohs' technique) necessary? *Arch Otolaryngol*. 1981;107:721–724.
35. Balch CM, Soong SJ, Gershenwald JE, et al. Prognostic factors analysis of 17,600 melanoma patients: validation of the American Joint Committee on Cancer melanoma staging system. *J Clin Oncol*. 2001;19:3622–3634.
36. Byers RM. The role of modified neck dissection in the treatment of cutaneous melanoma of the head and neck. *Arch Surg*. 1986;121:1338–1341.
37. Monsour PD, Sause WT, Avent JM, et al. Local control following therapeutic nodal dissection for melanoma. *J Surg Oncol*. 1993;54:18–22.
38. Singletary SE, Byers RM, Shallenberger R, et al. Prognostic factors in patients with regional cervical nodal metastases from cutaneous malignant melanoma. *Am J Surg*. 1986;152:371–375.