

Impact of scalp location on survival in head and neck melanoma: A retrospective cohort study

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Background: Scalp melanomas have more aggressive clinicopathological features than other melanomas and mortality rates more than twice that of melanoma located elsewhere.

Objective: We sought to describe the survival of patients with scalp melanoma versus other cutaneous head and neck melanoma (CHNM), and explore a possible independent negative impact of scalp location on CHNM survival.

Methods: A retrospective cohort study was performed of all invasive primary CHNM cases seen at a tertiary referral center over a 20-year period. Melanoma-specific survival (MSS) was compared between scalp melanoma and other invasive CHNM. Multivariable Cox proportional hazards regression was performed to determine associations with survival.

Results: On univariate analysis, patients with scalp melanoma had worse MSS than other CHNM (hazard ratio 2.22, 95% confidence interval 1.59-3.11). Scalp location was not associated with MSS in CHNM on multivariable analysis (hazard ratio 1.11, 95% confidence interval 0.77-1.61) for all tumors together, but remained independently associated with MSS for the 0.76- to 1.50-mm thickness stratum (hazard ratio 5.51, 95% confidence interval 1.55-19.59).

Limitations: Disease recurrence was not assessed because of unavailable data.

Conclusion: The poorer survival of scalp melanoma is largely explained by greater Breslow thickness and a higher proportion of male patients. (J Am Acad Dermatol <http://dx.doi.org/10.1016/j.jaad.2016.08.009>.)

Key words: head and neck; histopathology; melanoma; prognostic factors; scalp; survival.

Site-specific differences in melanoma prognosis between axial and limb locations are well accepted. Additional negative site-specific influences on prognosis have been described in several studies, including for melanoma of the upper back, posterior aspects of the arm, neck, and scalp (BANS); and melanoma of the head and neck.¹⁻⁷ However, there are also reports of these anatomic sites having no prognostic significance independent of other factors.⁸⁻¹¹

Abbreviations used:

BANS:	upper back, posterior aspects of the arm, neck, and scalp
CHNM:	cutaneous head and neck melanoma
CI:	confidence interval
HR:	hazard ratio
MSS:	melanoma-specific survival
SLN:	sentinel lymph node
VMS:	Victorian Melanoma Service

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Conflicts of interest: None declared.

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Several studies report that scalp melanoma is associated with poorer survival compared with other cutaneous head and neck melanoma (CHNM).^{3,12-16} In a recent study, we showed that scalp melanoma presents with higher-risk clinical and histologic features than other CHNM.¹⁷ It is not clear, however, whether scalp location carries an independent negative influence on survival, or if the poorer survival of patients with scalp melanoma is entirely explained by other poor prognostic features.

The aim of this study was to describe the survival of patients with scalp melanoma versus other CHNM and to assess other prognostic factors to determine whether scalp location is independently associated with melanoma survival.

METHODS

Institutional ethics approval was obtained from the Alfred Hospital and the Victorian Cancer Council for a retrospective cohort study of all invasive primary CHNM cases seen at the Victorian Melanoma Service (VMS) from its inception in October 1994 to February 2014. The VMS is a multidisciplinary tertiary referral center based at the Alfred Hospital in Melbourne, seeing approximately one quarter of new melanoma cases in the state of Victoria, Australia. All patients presenting to the VMS were entered into a prospectively maintained melanoma database.

Clinical features assessed for each patient included age, sex, date of diagnosis, and the tumor's anatomic site, which was recorded using detailed coding (including 101 cutaneous head and neck subsites, of which 8 were on the scalp). Anatomic sites were grouped as: (1) scalp, (2) face (which included the forehead, nose, lips, and cheeks), (3) neck, and (4) ear. A second histologic review of each melanoma was conducted by experienced dermatopathologists at the VMS after the initial histologic diagnosis and referral. Histologic features assessed were: tumor subtype, Breslow thickness, ulceration, mitotic rate per square millimeter, neurotropism, lymphovascular invasion, and satellite metastases.

Survival information of all patients included in the study was obtained from the Victorian Cancer Registry, a population-based cancer registry that collects data on all cancer diagnoses and mortality among residents of the state of Victoria, Australia. Vital status current as of September 5, 2014, was

obtained, and if applicable, date and cause of death, recorded as either melanoma or other. As many but not all patients return to the VMS at the time of disease recurrence, data were incomplete and hence disease recurrence was not assessed.

Mucosal and ocular melanomas were excluded, as were cases where the histology was not reviewed by an Alfred Hospital dermatopathologist, as was 1 case with unobtainable Breslow thickness. If a patient had more than 1 CHNM recorded, then any subsequent CHNM was excluded, unless the patient had a melanoma-specific death, in which case the CHNM with the lesser Breslow thickness was excluded. If a patient had 2 CHNM diagnosed at the same time, then the CHNM with the lesser Breslow thickness was excluded.

Comparison of melanoma-specific survival (MSS) was made between scalp melanoma and other CHNM, and among the 4 groupings of head and neck sites, using Kaplan-Meier survival estimates. Breslow thickness was treated as a continuous variable, and a log transformation was applied as the distribution of Breslow thickness measurements had a positive skew. Multiple imputation was used to impute missing values for 5 histologic variables (ulceration, mitotic rate, satellite metastases, lymphovascular invasion, and neurotropism).¹⁸ The Nelson-Aalen estimate of cumulative hazard was used in the imputation model along with the censoring indicator and all variables included in the analysis model.¹⁹ Twenty sets of imputed values for each missing value were generated and results of analyses applied to all 20 sets were combined according to Rubin's rules,²⁰ with multivariable Cox proportional hazards regression performed to determine independent factors predicting survival. Multivariable Cox models were also used in subanalyses defined by Breslow thickness strata: less than or equal to 0.75, 0.76 to 1.50, 1.51 to 4.00, and greater than 4.00 mm. All statistical analyses were performed using statistical software (Stata, Version 13, StataCorp LP, College Station, TX).

RESULTS

There were 900 patients with invasive CHNM, of whom 237 (26.3%) had scalp melanoma, 386 (42.9%) had face melanoma, 174 (19.3%) had neck melanoma, and 103 (11.4%) had ear melanoma.

CAPSULE SUMMARY

- Scalp melanoma has double the mortality risk of other head and neck melanomas.
- Poorer survival of scalp melanoma is largely explained by tumor thickness and a higher proportion of male patients.
- Scalp melanomas 0.76- to 1.50-mm thick may carry site-specific negative influence on survival, and may require special clinical consideration.

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