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LM Report

Melanomas of the scalp: is hair coverage preventing early diagnosis?

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Abstract

Background Scalp melanomas are usually thicker and show worse prognosis than other sites and other head and neck melanomas. One hypothesis to explain this aggressive behavior could be diagnosis delay attributed to hair concealment of lesions.

Methods Primary melanomas of the scalp diagnosed over two decades at four reference centers in Australia and Italy were included. Hair coverage and visibility of the lesions were assessed on preoperative photographic documentation by two investigators and correlated with some prognostic factors (Breslow thickness, mitotic rate, and ulceration). Patients records and pathology reports provided clinical and histological data.

Results The majority of 113 melanomas included were located on easily visible areas of the scalp – hairless scalp (49%) or hairline (15%). The remaining ones (36%), considered to be hair-covered, showed more frequently thinning of hair (63%) than a dense hair coverage (37%). Melanomas of “hairy scalps” were more frequently invasive (81%) and had higher median Breslow (0.8 ± 1.3 mm) than those arising on bald scalps or areas with thinning of hair (43%; 0 ± 0.6 mm), $P = 0.004$. However, when considering only the invasive cases ($n = 55$), Breslow thickness and mitotic rate were not statistically different between concealed and easily visible areas. Melanomas detected by a doctor were thinner than those first noticed by the patient, relatives, or a hairdresser ($P < 0.001$).

Conclusions Most scalp melanomas arose on easily visible areas, which are more prone to ultraviolet damage. Hair-covered ones, despite rare, could be overlooked during examination. Proactive screening of the scalp area should be encouraged.

Introduction

Scalp melanomas represent 3–7% of all cutaneous melanomas.[1–3] They are usually thicker and have a higher risk for brain metastasis and poorer prognosis, when compared with other body sites or other head and neck melanomas.[1–8] Scalp location has also been recently proved to be a strong prognostic factor of death from thin (≤1.0 mm) melanoma.[9] The factors contributing to the worse prognosis and pathogenesis of scalp melanomas are not yet completely understood.[1]

This behavior has been attributed to either delayed diagnosis due to poor visibility of the area or a more aggressive nature related to anatomical particularities, such as complex lymphatic drainage, folliculotropism, and rich blood supply, predisposing scalp melanomas to metastasize to intracranial and distant sites.[2,10–12] Melanoma of the scalp has been recognized as the "invisible killer" since 1995, when Beimer *et al.*[11] coined the term, repeatedly reproduced in the forthcoming literature. Different authors have hypothesized that hair concealment could be implicated in the diagnostic delay of scalp melanomas.[2,11,13] Large population-based and reference centers databases, however, failed to register data on hair density and alopecia.[1,2,7,13,14] Only recently have the issue of "hair coverage" and visibility of the scalp's skin started to be addressed.[15,16]

The International Dermoscopy Society (IDS) collected 75 cases of scalp melanomas from multiple institutions and found that 61% of them were located on bald scalps.[16] An Italian group recently found melanomas on bald scalps to be thicker than melanomas on hairy scalps, in a sample of 33 cases.[15] These data favor the hypothesis that the worse prognosis of scalp melanoma may be more related to a rapid change from horizontal to vertical growth rather than delayed detection due to hair concealment.

To further investigate this hypothesis and the mechanisms implicated in the worse prognosis of scalp melanomas, we conducted a retrospective study including all consecutive photographed cases of melanomas located on the scalp diagnosed at four dermatology tertiary-level referral centers in Australia and Italy.

Materials and methods

This is a multicentric, observational, and retrospective study. All consecutive cases of scalp melanomas that had been photographed preoperatively at four pigmented lesions referral clinics were included. Recurrent lesions were excluded. Photograph datasets included cases diagnosed from 1998 to 2019 at the Sydney Melanoma Diagnostic Centre, 2008 to 2019 at the Melanoma Institute Australia, 2012 to 2018 at the Dermatology Clinic of the University of Bologna, and 2007 to 2019 at the Skin Cancer Unit of Reggio Emilia. The participating centers comply with a policy of photographing all equivocal lesions prior to biopsy, which avoids a selection bias if only lesions of scientific interest had been photographed.

To define the scalp, we considered only the anatomical "hair-bearing" scalp, including the hairline. Areas located on the so-called "nonhair-bearing scalp",[10,11] that is, forehead and posterior neck, were excluded. Scalp subsites (frontal, temporal, parietal, vertex, occipital, and nuchal) were defined according to previous authors.[16]

Data on hair coverage, subsite location, and signs of sundamage were obtained from macroscopic and dermatoscopic photographs. Patients were classified by two evaluators (A.R.P. and another evaluator from each center) into different categories, according to hair density (bald, hairy, or thinning of hair) and visibility of the lesion (hairless, hair-covered, or hairline). Discordances were solved by consensus or by a third evaluator (H.C.). Hair density categories were introduced by previous authors.[15] For this research, complete absence of hair or scarce hair shafts, covering less than 10% of the lesion, was classified as "bald"; dense hair coverage, compatible with normal hair density, was classified as "hairy"; and intermediate scenarios were considered "thinning of hair". Hairline was defined as the transition between the "hair-bearing" scalp and the face or neck. A lesion was considered to be on the hairline when located on these transitional areas and with at least 50% of its surface covered by hair. If more than 50% of the lesion was located on the face or neck, beyond the hairline, it was not considered as a scalp melanoma and was excluded.

The proportion of invasive melanomas, Breslow thickness, presence of ulceration, and mitoses were compared among different groups. Clinical information was retrieved from patients' files, including age, gender, and detection of the lesion (doctor, patient, relative, or hairdresser). Histopathology reports provided data on melanoma subtype, Breslow thickness, ulceration, mitotic rate, and association with a nevus.

For quantitative variables, median and interquartile range (IQR) were calculated. Qualitative variables were analyzed with absolute and relative frequencies. *P*-values for differences in proportions were calculated using Pearson's chi-square test and for differences in numerical variables using the Mann-Whitney U test or Kruskal-Wallis test. Correlations between numerical variables were analyzed with the Pearson correlation coefficient. The significance level was established at $P < 0.05$.

All participants consented to the use of their de-identified information and images for research purposes. The study has been approved by the Federal University of Sao Paulo Ethics Committee (CAAE: 90241718.6.0000.5505). For Australian sites, participants signed a written informed consent to use clinical photographs and related data for research purposes as part of their enrollment in the MIA melanoma research database, which has been operating since the 1970s and was approved by the Sydney Local Health District Ethics Committee.

Results

A total of 113 cases of primary melanomas located on the scalp were included. Their clinical and histological characteristics are detailed in Table 1.

The vast majority of scalp melanomas occurred in males (86%) and individuals over 60 years old (72%), with clinically evident alopecia (80%) and sun-damaged scalps (70%).

Most melanomas were located on easily accessible areas for examination, which were hairless scalp (49%) or hairline (15%). The remaining ones (36%), considered to be hair-covered, showed more frequently thin and scarce hair shafts over the melanoma area (63%) than a dense hair coverage (37%). Examples of categories of hair coverage and visibility are presented in Figures 1 and 2.

The upper parts of the scalp (parietal, vertex, and frontal) comprised more than 80% of the cases, whereas melanomas located on the temporal and occipital subsites were rarer.

Table 1 Clinical and histological characteristics of included patients (n = 113)

Male gender – n (%)	97 (85.8)
Median age (IQR)	69 (58–79)
Scalp subsite location – n (%)	
Parietal	48 (42.5)
Vertex	28 (24.8)
Frontal	18 (15.9)
Temporal	15 (13.3)
Occipital	4 (3.5)
Clinically evident alopecia – n (%)	90 (79.6)
Sun-damaged scalp – n (%)	78 (69)
Visibility of the melanoma – n (%)	
Hairless area of the scalp	55 (48.7)
Hair-covered area of the scalp	41 (36.3)
Hairline	17 (15)
Hair coverage (over melanoma area) – n (%)	
Bald	57 (50.4)
Thinning of hair	40 (35.4)
Hairy	16 (14.2)
First noticed by – n (%)[a]	
Doctor	46 (40.7)
Self	27 (23.9)
Relative	10 (8.8)
Hairdresser	4 (3.5)
Personal history of other melanomas – n (%)[b]	36 (31.9)
Personal history of nonmelanoma skin cancer – n (%)[c]	49 (43.4)
Histological subtype – n (%)[d]	
Superficial spreading melanoma	34 (30.6)
Lentigo maligna	30 (27)
Melanoma in situ, unspecified	28 (25.2)
Lentigo maligna melanoma	7 (6.3)
Nodular	7 (6.3)
Desmoplastic	3 (2.7)
Nevoid	2 (1.8)
Median tumor thickness in mm (IQR)[e]	in situ (in situ-1.1)
Ulceration present – n (%)[f]	10 (19.6)
Mitotic rate $\geq$1/mm^2 – n (%)[g]	22 (44.9)

IQR, interquartile range.
[a]Missing data for 26 patients.
[b]Missing data for 3 patients.
[c]Missing data for 11 patients.
[d]Missing data for 2 patients.
[e]Missing data missing for one patient.
[f]Only invasive cases considered (n = 55), missing data for 4 cases.
[g]Only invasive cases considered (n = 55), missing data for 6 cases.

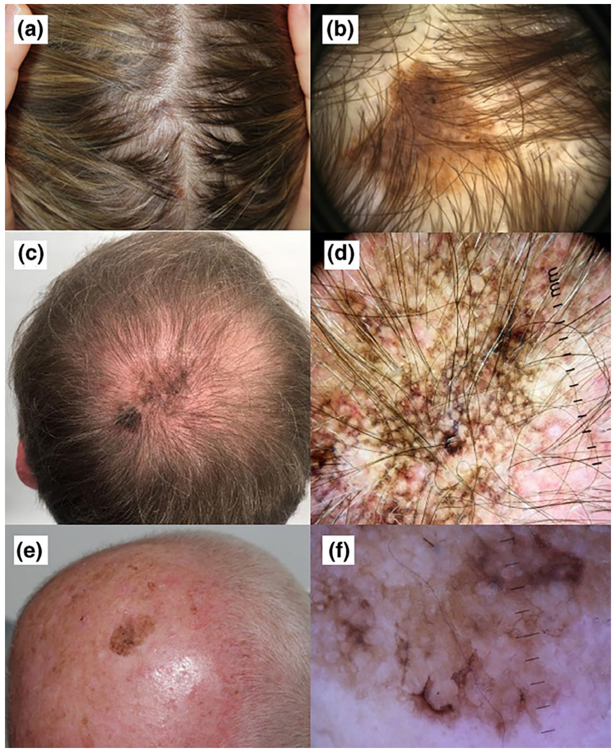

Figure 1 Examples of the three categories of *hair coverage*: macroscopic image (a) and dermoscopy (b) of a superficial spreading melanoma arising on the *hairy scalp* of a female in her 50s (Breslow 0.3 mm, no ulceration, no mitoses, associated with a melanocytic nevus); macroscopic image (c) and dermoscopy (d) of a melanoma in situ, subtype unspecified, arising on a scalp area with *thinning of hair* of a male in his 60s; macroscopic image (e) and dermoscopy (f) of a lentigo maligna arising on the *bald scalp* of a male in his 70's

High proportions of patients with a personal history of additional melanomas (32%) and of nonmelanoma skin cancers (NMSC) (43%) were observed in our sample.

Clinically evident alopecia, observed in most cases (80%), was more common in males (88%) than females (31%) ($P < 0.001$). In fact, most melanomas in females (56%) and only 7% in males occurred in hairy areas of the scalp.

A slight majority of lesions were not invasive (51%), and median tumor thickness was in situ (in situ-1.1 mm). Ulceration and mitotic rate $\geq$1/mm^2 were observed, respectively, in 18.2 and 40% of the invasive melanomas. According to the histopathology reports, only 15% of the melanomas were associated with a melanocytic nevus.

Clinical and histological variables according to hair coverage and visibility of scalp melanoma categories are detailed in Tables 2 and 3.

Hairy patients, as compared to those with thinning of hair and baldness, were younger ($P < 0.001$) and more frequently had invasive melanomas ($P < 0.001$), of subtypes other than lentigo maligna/lentigo maligna melanoma (LM/LMM) ($P < 0.001$) and with higher Breslow thickness ($P = 0.004$). However, when considering only the invasive cases, Breslow thickness was not different among different categories of hair coverage. Similarly, the groups did not differ regarding mitotic rate, and comparisons were not applicable for ulceration due to the small number of individuals presenting this feature in each group (Table 2).

Similar findings were observed for different visibility subgroups. Categories “hairless” and “hairline” were considered to be “easily visible” and were analyzed together. Hair-covered

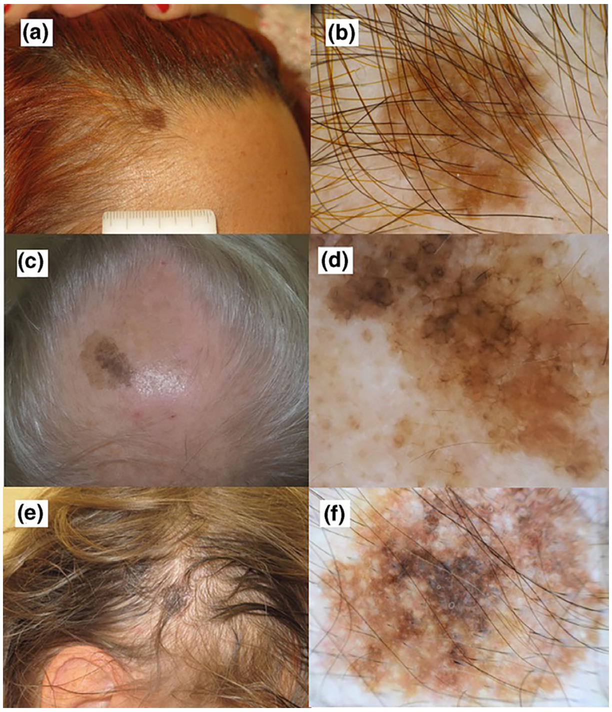

Figure 2 Examples of the three categories of *visibility*: macroscopic image (a) and dermoscopy (b) of a melanoma in situ, subtype unspecified, arising on the *hairline* of the temporal scalp of a female in her 40s – although the patient has a dense hair coverage, the area was considered to be easily visible as located on the hairline; macroscopic image (c) and dermoscopy (d) of a lentigo maligna arising on a *hairless* area of the scalp of a male in his 80s; macroscopic image (e) and dermoscopy (f) of a superficial spreading melanoma (Breslow 0.3 mm, no ulceration, no mitoses) arising on a *hair-covered* area of a male's scalp in his 60s – although there is thinning of hair, the lesion could be overlooked if the hair shafts of this area were not sectioned during examination

melanomas were more frequently invasive ($P < 0.001$), of subtypes other than LM/LMM ($P = 0.002$), and had higher Breslow thickness ($P = 0.001$) when compared with the more exposed and visible ones. However, when only invasive cases were considered, differences in Breslow thickness, mitotic rate, and ulceration were not significant (Table 3).

Two high-risk and "hairy" patients, that were under regular surveillance, had their invasive melanomas detected in-between consultations, by themselves or a hairdresser (Fig. 3). Only four cases were detected by a hairdresser, and three of them were invasive melanomas. Melanomas detected by a doctor had thinner Breslow thickness – in situ (in situ-0.3 mm) – than those first noticed by the patient, relatives, or a hairdresser – 1.0 (0.3–3.7 mm) ($P < 0.001$). The difference continued to be significant when only invasive cases were considered ($P = 0.02$). Hair-covered melanomas tended to be more frequently detected by relatives, patients, or hairdressers than by a doctor ($P = 0.05$).

There were no significant differences between melanomas associated with a nevus in terms of hair coverage and visibility when compared with those not associated with a nevus.

A significant positive correlation between age and Breslow thickness was found in our sample of invasive melanomas – older patients had higher Breslow thickness than younger ones (Pearson correlation coefficient: 0.324 – Sig.$P = 0.02$).

Discussion

This observational study was conducted at four tertiary referral centers in Italy and Australia, assessing the epidemiology of scalp melanomas, with emphasis on hair coverage, visibility, and detection. Data collection relied on systematic photographic documentation of equivocal lesions over two decades, being the largest sample in the current literature for a similar study.

There was a striking male predominance in the included population, which is similar to those reported for scalp melanomas in previous publications (74–86%).[1,2,6,7,10] This is probably related to androgenic alopecia and higher cumulative and intermittent ultraviolet damage on the scalp, considering that hair coverage acts as a natural photoprotection mechanism.[17]

Male gender is known to be an independent predictor of worse prognosis for melanomas overall. However, studies that correlated scalp location with worse melanoma-specific and overall survival proved this finding was independent of other confounders, such as gender, age, and Breslow thickness, on multivariate analysis,[1,6,7] which implies that other mechanisms may be responsible for the aggressive behavior of scalp melanomas.

Scalp melanoma has been repeatedly quoted in literature as the "invisible killer".[1] However, most cases in our series occurred in easily visible areas of the scalp, with scarce or absent hair coverage and signs of photodamage. Despite being extremely rare, we demonstrated that melanomas may arise on densely hair-covered scalps, suggesting that mechanisms other than ultraviolet radiation are also implicated in their pathogenesis.

Subsites at the upper part of the scalp, more directly sun exposed (parietal, vertex, and frontal), were predominant in our sample. Stanganelli *et al.*,[16] also found a predilection for the parietal area, however a considerably higher proportion of melanomas on the occipital area has been reported by them (25.3%, as compared to 3.5% in our sample). Differences in the boundaries for the definition of occipital/nuchal scalp and posterior neck may partially explain such discordance.

Median Breslow thickness was in situ, with half of the melanomas detected still noninvasive. As well, most lesions were first noticed by a doctor, which implies that this population had been under proactive screening favoring early diagnosis.

LM accounted for half of the melanomas in situ (MIS) and represented 52% of the Australian cases, as compared to only 8% of the Italian ones. LM is regarded as a steadily growing problem worldwide but especially in Australia, where it has an estimated annual incidence of at least 12.2 cases/100,000

Table 2 Clinical and histological features according to hair coverage of scalp melanomas

	Hairy	Thinning	Bald	*P* value
All cases (n = 113)				
Melanomas – n (%)	16 (14.2)	40 (35.4)	57 (50.4)	
LM/LMM – n (%)	1 (6.3)	5 (13.2)	31 (54.4)	**<.001**[b]
Other subtypes[a]	15 (93.8)	33 (86.8)	26 (45.6)	
Invasive – n (%)	13 (81.3)	24 (60)	18 (31.6)	**<.001**[b]
In situ	3 (18.8)	16 (40)	39 (68.4)	
Median Breslow in mm (IQR)	0.8 (0.4–1.7)	0.3 (in situ-1.0)	In situ (in situ-0.6)	**0.004**[c]
Ulceration present[d] – n (%)	1 (6.7)	4 (10.3)	5 (9.1)	N/A[e]
Mitotic rate[f] $\geq$1/mm^2 – n (%)	6 (40)	8 (21.1)	8 (14.8)	0.10[b]
Median age in years (IQR)	52 (45–63)	68 (56–76)	75 (67–81)	**<.001**[c]
Invasive cases (n = 55)				
Melanomas – n (%)	13 (23.6)	24 (43.6)	18 (32.7)	
LMM – n (%)	1 (7.7)	3 (13.6)	3 (16.7)	N/A[e]
Other subtypes[g]	12 (92.3)	19 (86.4)	15 (83.3)	
Median Breslow in mm (IQR)	1 (0.7–2.1)	0.6 (0.3–2.3)	1.3 (0.6–5.1)	0.16[c]
Ulceration[d] present – n (%)	1 (8.3)	4 (17.4)	5 (31.3)	N/A[e]
Mitotic rate[f] $\geq$1/mm^2 – n (%)	6 (50)	8 (36.4)	8 (53)	0.55[b]
Median age in years (IQR)	54 (47–63)	64 (49–74)	81 (69–88)	**0.001**[c]

IQR, interquartile range; LM, lentigo maligna; LMM, lentigo maligna melanoma. Significance level = $P < 0.05$.
[a]Including: in situ, unspecified; superficial spreading melanoma; nodular; desmoplastic and nevoid – missing data for 2 cases.
[b]Pearson's chi-squared test.
[c]Kruskal–Wallis test.
[d]Missing data for 4 cases.
[e]N/A: statistic test not applicable due to low number of individuals in each category.
[f]Missing data for 6 cases.
[g]Including: superficial spreading melanoma; nodular; desmoplastic and nevoid - missing data for 2 cases.

inhabitants,[18] expected to increase with longer life expectancy. Most large scalp melanoma series published so far excluded MIS, which precludes comparisons with our sample. Xie *et al.*, however, analyzed 306 scalp melanomas seen at the Victorian Melanoma Service in Australia, between 1994 and 2014, including 62 MIS (20%). They found a striking proportion of 86% of MIS being LM subtype.[2] It is also important to take into account that Australian dermatology clinics included in our study are the main reference centers for confocal microscopy in the country, which is most frequently requested for diagnosis or mapping of margins of LM on the head and neck area. Hence, the proportion of LM in our sample may be overrepresented not only due to geographical particularities but also referral bias. A possibility that some LM may have been classified as MIS, unspecified subtype, has to be considered and could possibly explain the discrepancy in LM proportion between cases from Australia and Italy.

To compare different subgroups of hair coverage and visibility with melanoma histological characteristics and prognostic factors, we presented data for all cases and the invasive ones separately. When all cases were considered together, melanomas of hairy scalps were significantly thicker, more frequently invasive, and of subtypes other than LM/LMM than those arising on bald scalps or scalps with thinning of hair. Similar findings were observed when comparing easily visible areas (hairless scalp or hairline) with those that were hair-covered. Such correlations suggest that hair concealment may indeed be related to later diagnosis and melanoma features of worse prognosis. However, this may also be attributed to the higher proportion of lentigo maligna subtype in the groups showing baldness or thinning of hair. LM has an intrinsic lower tendency to become invasive as compared to other subtypes with an estimated annual progression rate to invasion of only 3.5% per year.[19] This was consistent with our low prevalence of LMM in our sample (6.2%) and underlies that the in situ nature of LM cannot be interpreted as early diagnosis.

When considering only the invasive cases, though, differences in Breslow thickness between different categories of both visibility and hair coverage were not significant. The same was true for the other prognostic factors analyzed – ulceration and mitotic rate – which were not significantly different between easily visible and concealed melanomas. Considering these findings, it is possible to hypothesize that other anatomic particularities, apart from hair concealment and diagnosis delay, may also influence the worse prognosis of melanomas located on the scalp and their higher predisposition to metastasize into intracranial and distant sites.

Only one previous comparable publication could be found investigating hair coverage characteristics of scalp melanoma patients. Benati *et al.* analyzed 33 scalp melanomas, including some MIS.[15] They found that most melanomas developed on less densely covered scalps (with baldness or thinning of hair),

Table 3 Clinical and histological variables according to visibility of scalp melanoma

	Hairless/ Hairline[a]	Hair covered	P value
All cases (n = 113)			
Melanomas – n (%)	72 (63.7)	41 (36.3)	
LM/LMM – n (%)	32 (44.4)	5 (12.2)	**0.002**[c]
Other subtypes[b]	40 (55.6)	34 (82.9)	
Invasive – n (%)	25 (34.7)	30 (73.2)	**<.001**[c]
In situ	47 (65.3)	11 (26.8)	
Median Breslow thickness in mm (IQR)	In situ (in situ-0.5)	0.6 (in situ-1.9)	**0.001**[d]
Median age in years (IQR)	75 (63–81)	62 (53–74)	**0.001**[d]
Invasive cases (n = 55)			
Melanomas	25 (45.5)	30 (54.5)	
LM/LMM – n (%)	4 (16)	3 (10)	N/A[e]
Other subtypes[e]	21 (84)	25 (83.3)	
Median Breslow thickness in mm (IQR)	1.1 (0.4–4)	0.8 (0.5–2.3)	0.62[d]
Ulceration[g] present – n (%)	7 (30.4)	3 (10.7)	0.16[c]
Mitotic rate[h] ≥1/mm^2 – n (%)	10 (45.5)	12 (44.4)	>.99[c]
Median age in years (IQR)	79 (59–86)	58 (50–69)	**0.002**[d]

IQR, interquartile range; LM, lentigo maligna; LMM, lentigo maligna melanoma. Significance level = $P < 0.05$.
[a]Categories hairless and hairline were considered to be “easily visible” and were grouped together for this analysis.
[b]Including: in situ, unspecified; superficial spreading melanoma; nodular; desmoplastic and nevoid – missing data for 2 patients.
[c]Pearson’s chi-square test.
[d]Mann-Whitney test.
[e]Including: superficial spreading melanoma; nodular; desmoplastic and nevoid – missing data for 2 patients.
[f]N/A: statistic test not applicable due to low number of individuals in each category.
[g]Missing data for 4 cases.
[h]Missing data for 6 cases.

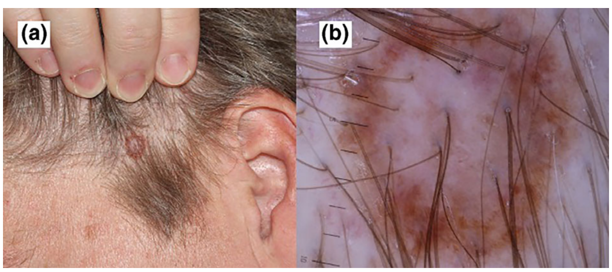

Figure 3 Nevoid melanoma, Breslow 0.6 mm, no ulceration, no mitoses. Macroscopic image (a) and dermoscopy (b). Temporal scalp, “*hairy*” male in his 50s. High-risk patient (personal history of 3 previous melanomas), under regular skin surveillance. Lesion was detected by the patient as it became raised

however melanomas on bald scalps had a higher Breslow thickness. A possible delay in seeking medical care in the group of bald patients, that were older individuals, was the hypothesis raised by the authors to explain this finding. In fact, in our population, there was a significant positive correlation between Breslow thickness and age. Considering that a larger sample could address this question more accurately, we included in our study most cases also analyzed in this previous publication from Italy.

An international compilation of 75 scalp melanomas from multiple centers organized by the IDS found that 61% of patients diagnosed with melanomas located on the scalp had alopecia but did not calculate differences in Breslow thickness or melanoma subtypes between bald or nonbald patients, as its main objective was to describe the dermoscopy findings.[16]

In our series, those melanomas detected by a doctor were thinner than those first noticed by the patient, relatives, or a hairdresser, which reinforces the need for active screening of this body site. Recently launched technologies for total body 3D photography and automated diagnosis have the scalp area as one of their major limitations.[20] Doctor inspection of this body site continues to be the goldstandard and an optimized opportunity for early detection.

Self-examination of the scalp has obvious limitations. Also, careful inspection of the area by doctors can be time-consuming and difficult, thus being a frequently neglected step during routine full-skin examination.[11,21,22] One helpful and wise strategy is to tell patients to engage their hairdressers in the screening of the scalp and posterior neck for any lesion. In a series of 128 invasive scalp and neck melanomas, 10% were detected by a hairdresser, and these lesions had a trend towards lower Breslow thickness.[23] In another cohort from Australia, including 244 scalp melanomas, 13 cases (5.3%) were first noticed by a hairdresser.[2] Roosta *et al.*[24] showed that the overwhelming majority of 108 hairdressers interviewed are willing to learn more about skin cancer (91.7%) and to contribute for melanoma screening in the general population (93.5%). Educational video interventions effectively enhance knowledge and confidence of these professionals for melanoma detection.[25]

Regarding potential limitations of this study, our data were collected from tertiary referral centers and may not represent the actual populational epidemiology of scalp melanomas. Also, as stated before, the proportion of LM in the Australian cases may be overrepresented by referral bias for confocal microscopy assessment. Central review of all pathology slides was not conducted, which could have possibly adjusted the rate of LM cases being incorrectly classified as MIS, unspecified subtype. Ideally, a large population-based cohort would describe more precisely the epidemiology of scalp melanomas regarding hair coverage, allow correlations with patient survival, and accurately estimate the weight of this feature as a prognostic factor. A small sample size was also a limitation that could be minimized but not totally overcome with a multicentric approach due to the rarity of scalp melanomas and the need for systematic preoperative photography performed as an institutional policy for inclusion.

On the other hand, one of the positive aspects of this study is the high-quality photographs collected over decades and the multicentric design. Photographic documentation provides accurate data on dermoscopy, subsite location, photodamage, and hair density, which are superior to information obtained with questionnaires or patient files.

In conclusion, scalp melanomas tend to fall into one of two different scenarios: LM/LMM subtypes, arising on bald scalps of elderly individuals that present with alopecia and photodamage and are usually detected before becoming invasive (probably related not only to visibility but also to slow growth), and other subtypes, arising on the scalp of younger individuals, that are more frequently concealed by hair and usually detected later in an invasive phase. Most scalp melanomas in our sample developed on easily visible and sun-exposed areas of the scalp (bald scalp or hairline). Hair-covered ones, despite being rare, were more frequently invasive and could be easily neglected during examination but were not proven to be thicker when only invasive lesions were analyzed. Routine examination of the scalp should be encouraged aiming at early detection not only of melanomas but also of nonmelanoma skin cancers and cutaneous metastases, which are not uncommon in this site.[26] Finally, patients should also be advised to engage their hairdresser in scalp screening.

Acknowledgments

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