

Balloon cell melanoma in primary care practice: a case report

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ABSTRACT A case of balloon cell melanoma encountered in a primary care skin cancer practice in Melbourne, Australia is presented. The presenting lesion was 6 mm in diameter, ulcerated, non-pigmented and without any algorithmic clues to melanoma. However the presence of terminal hairs caused the clinician to suspect that it was melanocytic. The lesion was reported as a balloon cell melanoma, Clark level 4, Breslow thickness 2 mm with a mitotic index of 4 per square mm. This is an extremely rare melanoma subtype. Author DW has encountered only two cases in a career involving in excess of one million signed out dermatopathology reports. A search of the literature has not discovered any previously published dermatoscopy images of a balloon cell melanoma.

Case report

A 68-year-old man presented to a primary care skin cancer clinic in Melbourne, Australia. He was concerned about a skin lesion on his mid back which he reported having traumatised by scratching a week earlier (Figure 1). The patient had not been previously aware of this lesion. There was no personal or family history of melanoma. A single, well-differentiated squamous cell carcinoma had been excised from his nose 3 years earlier. There was no history of exces-

sive occupational or recreational sun exposure and he had never patronised solariums or used welding equipment.

On examination the patient had Fitzpatrick skin type 2 with significant actinic damage to the face, forearms and dorsum of the hands, with multiple solar lentiginos and scattered small actinic keratoses. The lesion of concern was located on the central back. No other lesions suspicious for skin cancer were discovered.

A whole body skin examination was undertaken with the aid of a Heine Delta 20 non-polarizing dermatoscope

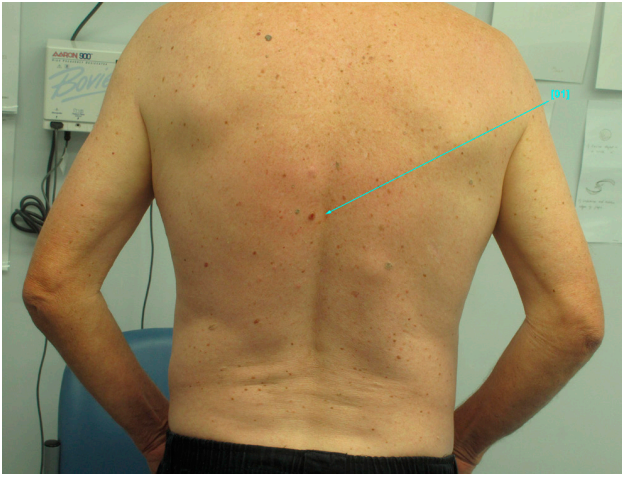


Figure 1. The arrow points to a lesion of concern on the back of a 68 year old man. [Copyright: ©2013 Inskip et al.]



Figure 2. Dermatoscopic image of the skin lesion indicated by the arrow in Figure 1. Three terminal hairs protrude from a structureless yellow lesion. Structureless red centrally is evidence of ulceration as is a single thread of adherent fibre (inferior central). A few small curved and dot vessels are seen inferior to the central structureless red area but are not considered sufficient to be a clue to the specific diagnosis. [Copyright: ©2013 Inskip et al.]

(Heine Optotechnik, Herrshing, Germany). Digital clinical and dermatoscopic images were taken with a Medicam 800 Fotofinder non-polarized camera (Fotofinder Systems GmbH, Aichner, Birnbach, Germany), the dermatoscopy images being at 20 x magnification.

The lesion of concern on the patient's central back was 6mm in diameter (Figure 2). It was non-pigmented, nodular and centrally ulcerated being covered in a yellow, dried, serous exudate. Being non-pigmented, this lesion could not be assessed algorithmically for clues to melanoma. Ulceration in the absence of trauma is described as a clue to malignancy [1], but in this case a history of prior trauma was present. Dermatoscopically the lesion was a non-pigmented, structureless yellow with three terminal hairs emanating from it. Central structureless red colour was evidence of ulceration as was a single thread of adherent fibre [1]. Vessels observed dermatoscopically were very sparse, there being just a few vessels as curved vessels and dots. Although a pattern of polymorphous vessels including dots is a pub-

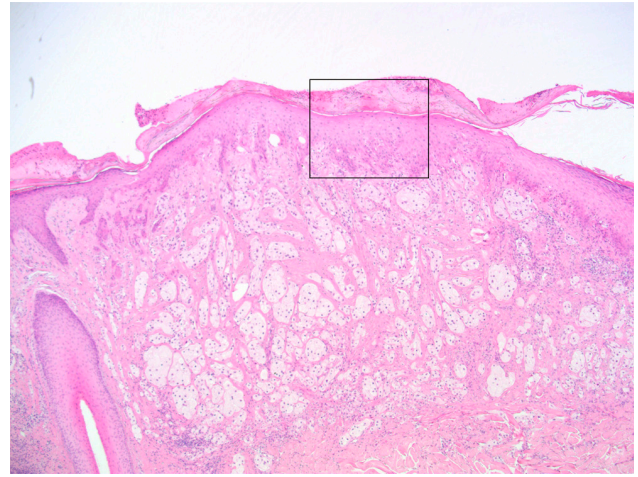


Figure 3. Low power dermatopathologic view of the lesion shown in Figures 1 and 2. Beneath a crusted epidermis is a proliferation of nested cells with abundant clear cytoplasm. [Copyright: ©2013 Inskip et al.]

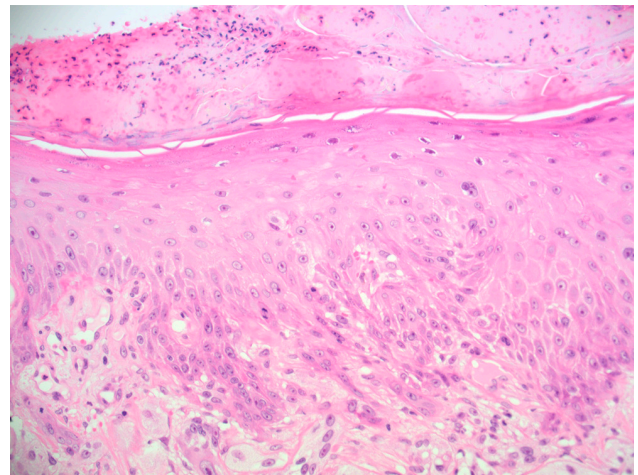


Figure 4. High power view of the boxed area in Figure 3. No intra-epidermal melanoma component is identified. [Copyright: ©2013 Inskip et al.]

lished clue to melanoma [2], there were insufficient vessels visible to constitute a clue to the specific diagnosis in this case. Of diagnostic significance was the presence of three terminal hairs protruding from the lesion, visible both clinically and dermatoscopically. This caused the clinician to suspect that the lesion was melanocytic [1], and therefore amelanotic melanoma was considered as a possible diagnosis.

An excisional biopsy was performed with the excision submitted for assessment by a specialist dermatopathologist. Histologic sections (Figures 3-11) showed a compound melanocytic proliferation with two components, the first consisting of bland nevus cells, which matured with descent and tracked down adnexal structures in a congenital pattern. The second component, by contrast, was comprised of centrally positioned atypical aggregates of grossly distended epithelioid melanocytes, exhibiting a pseudo-xanthomatous balloon cell change in their cytoplasm, and pleomorphic vesicular nuclei with nucleoli. These cells did not mature with descent,

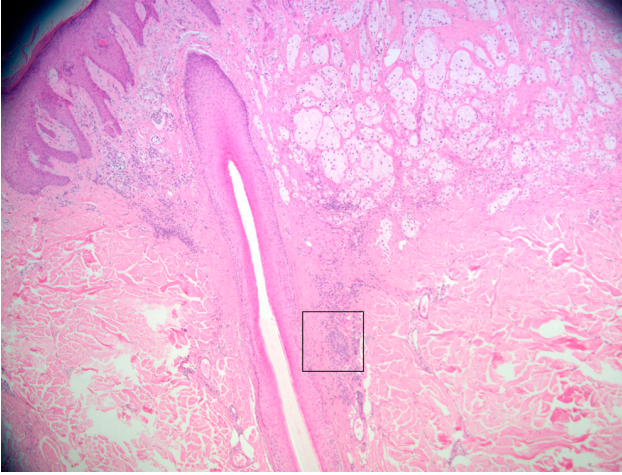


Figure 5. Adjacent to the clear cell proliferation, clusters of cells without copious cytoplasm are arranged along a hair follicle. [Copyright: ©2013 Inskip et al.]

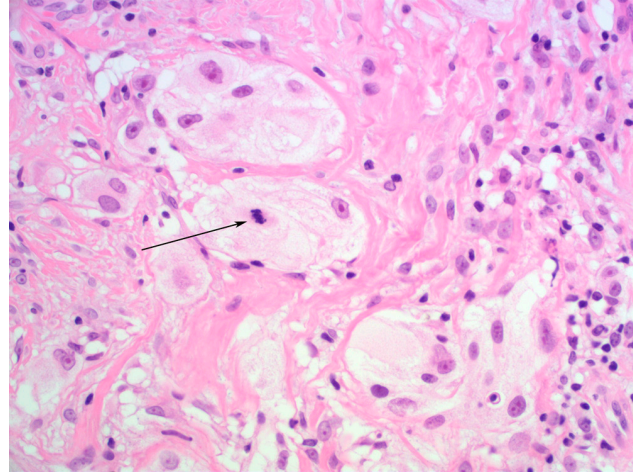


Figure 8. Mitotic figures (four were counted) are easily identified in the balloon cells (arrow). [Copyright: ©2013 Inskip et al.]

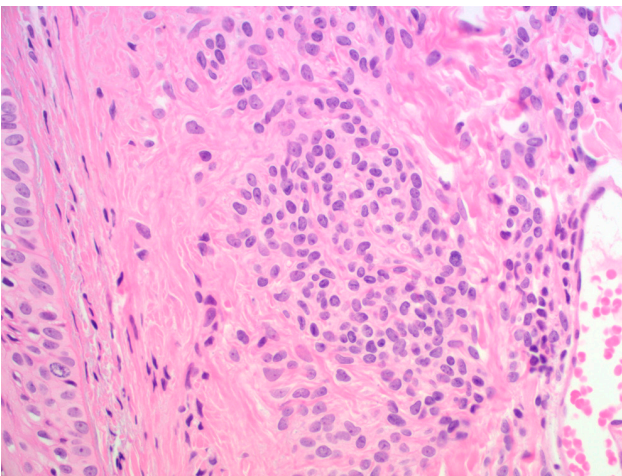


Figure 6. High power view of the boxed area in Figure 5 reveals bland benign nevus cells in clusters along the follicle. [Copyright: ©2013 Inskip et al.]

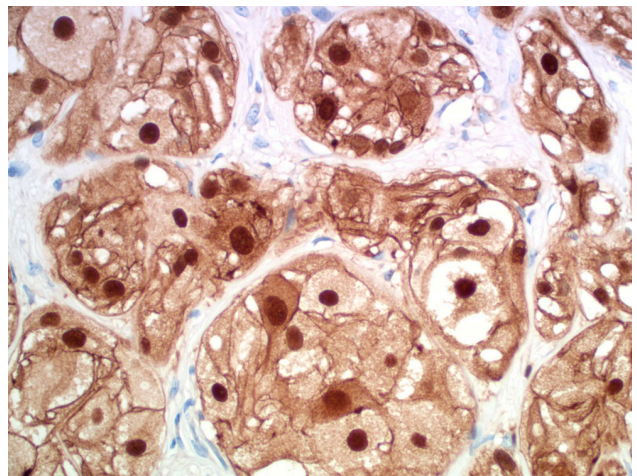


Figure 9. Nuclear and cytoplasmic staining with S100. [Copyright: ©2013 Inskip et al.]

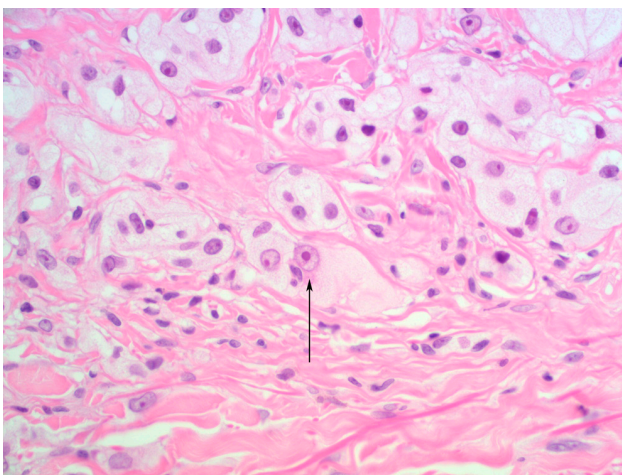


Figure 7. A high power view of the the balloon cells at the base of the lesion. No pigmentation is noted. Nuclear enlargement (arrow) and prominent nucleoli in cells at the base of the lesion indicate a lack of progressive maturation on descent in the dermis. [Copyright: ©2013 Inskip et al.]

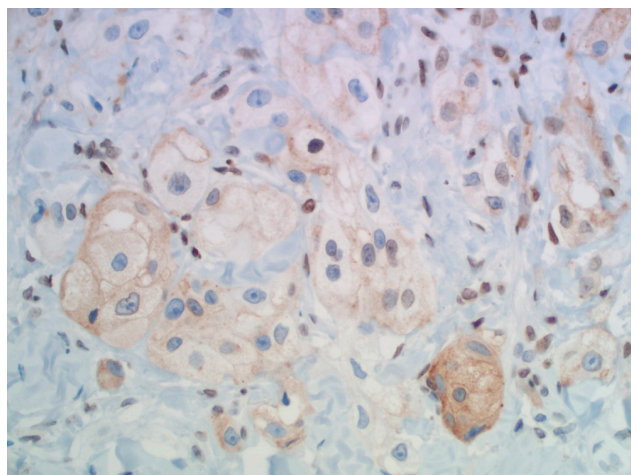


Figure 10. Faint cytoplasmic staining with HMB-45. [Copyright: ©2013 Inskip et al.]

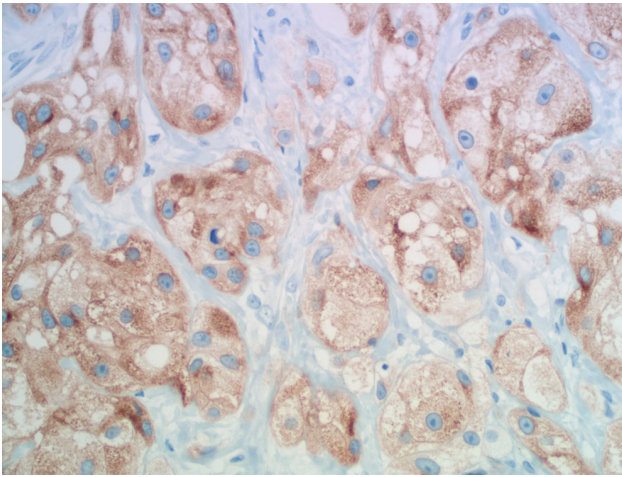


Figure 11. A Melan-A stain highlights the cytoplasm of the balloon cells. [Copyright: ©2013 Inskip et al.]

exhibited 4 mitoses per mm sq, and filled the dermis to a depth of 2 mm (level 4). The final diagnosis was: Malignant melanoma of balloon cell type; Clark level 4; Breslow thickness 2 mm, arising within a pre-existing congenital nevus.

Discussion

Balloon cell malignant melanoma (BCMM) has been described as the rarest histological type of primary cutaneous melanoma [3]. The first case was reported in 1970 [4]. The mortality rate appears high. In the largest study to date only 7 out of 34 patients (21.2%) were alive without evidence of disease at last contact and 19 of 33 (57.5%) patients with adequate follow-up information died of disseminated tumours from 2 months to 12 years after the initial treatment. This high mortality probably reflects the deep extent of the tumour at presentation. The prognosis seems to correlate with tumour thickness as with other melanoma subtypes [5,6]. Balloon cell melanoma has been reported arising in the dermal component of superficial spreading melanoma [7], and while one balloon cell nevus, which was described as an intradermal nevus, was noted to have rare focal junctional nests of balloon cells [8], a search of the literature has discovered no reports of in situ BCMM nor of BCMM with a junctional component of balloon cells. In fact, BCMM has been described as a vertical growth phase melanoma [6]. The case herein reported had no apparent epidermal involvement and this, along with the lack of any examples of in situ BCMM reported in the literature, suggests that these melanomas may in fact have a dermal origin. The case we report arose in a pre-existing congenital type nevus as evidenced by both the presence of terminal hairs and the dermatopathologic findings. We speculate that in this case the melanoma may have arisen from a component of this nevus. There is one previous case report of a BCMM coinciding with a dermal nevus showing balloon cell changes [9]. In another reported case

a superficial spreading melanoma (level 4 Breslow thickness 1.75 mm), arising in a giant congenital nevus which had balloon cell changes, was associated with a nodal capsular, trabecular and intraparenchymal balloon cell nevus [10].

Histologically small foci of balloon cell change appearing as foamy cells with abundant cytoplasmic vacuoles are seen in up to 2% of melanocytic naevi [11]. The melanocytic nature of balloon cells has been confirmed both by immunohistochemical studies [12] and electron microscopy, which revealed that the ballooning change was due to progressive vacuolisation of melanosomes [13,14,15]. BCMM is characterised by aggregations of balloon cells [3], and Kao defined BCMM as a melanoma composed of more than 50% foamy cells [5]. The dermatopathologic features differ from those of balloon cell nevus with respect to nuclear pleomorphism, atypia, mitoses and the absence of intervening stroma [5]. An additional clue to BCMM is lack of maturation of melanocytes on descent into the dermis [3]. The foamy cells are usually sparser in primary melanomas than subsequent metastases [3]. In contrast to balloon nevus cells, the cells of BCMM generally lack melanin [16]. Sparse quantities of melanin granules were only found in 9 cases of the 34 reported by Kao [5].

The dermatopathologic diagnosis of BCMM is reportedly challenging both with respect to primary and metastatic lesions because the appearance may be cytologically bland and both careful clinico-pathologic correlation as well as correctly interpreted immunohistochemical stains can be important to achieve an accurate diagnosis [3]. In the first reported case [4] and several subsequent cases [3] the metastatic lesion has been initially misinterpreted. Dermatopathologically the differential diagnosis includes balloon cell change in benign nevi, clear cell sarcoma, clear cell metastatic renal cell carcinoma, basal cell carcinoma, squamous cell carcinoma, malignant clear cell acrospiroma, sebaceous carcinoma and clear cell dermatofibroma [6].

Clinically balloon cell nevi cannot be distinguished from other nevi [17], but a dermatoscopic feature of white globular structures in a balloon cell nevus has been described [18]. In a review of the literature the various clinical appearances of BCMM were characterised as nodular, ulcerated, polypoid and papillomatous, and the common absence of pigmentation was noted [3]. There are no discovered previous reports of the dermatoscopic features of BCMM. The case reported herein was clinically an ulcerated, nodular non-pigmented lesion with the presence of terminal hairs but without any specific dermatoscopic clues to melanoma or to the presence of balloon cells.

Conclusion

Nodular melanoma should always be considered in the differential diagnosis of a newly presenting raised lesion

on the skin regardless of the absence of pigmentation or standard dermatoscopic clues to melanoma. In this case the presence of terminal hairs suggested that the lesion was melanocytic and excision biopsy led to the diagnosis of a rare melanoma subtype.

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