Recurrent Subungal Melanoma in Situ with Selective Spread into the Graft. Successful Treatment with Mohs Surgery

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Abstract

Subungal melanoma is among the rarest forms of melanoma and diagnostic delay is common. Even once the diagnosis of melanoma is confirmed and the lesion excised special difficulties exist to determine the histological peripheral margins, which can lead to later recurrences. Mohs micrographic surgery has been advocated as a treatment for melanoma, especially for melanomas with poorly defined clinical margins and those on the hands and feet. Several cases of recurrent melanoma into the skin graft have been published, though selective invasion of the graft has rarely been reported. We report the case of a recurrent subungal melanoma in situ with a selective spread into the skin graft that was successfully treated with slow Mohs surgery.

CASE REPORT

A 48-year-old woman presented with a four-year history of irregular longitudinal pigmented streaks (longitudinal melanonychia) on her right thumb with extension to the proximal nail fold (Hutchinson’s sign). Clinical and dermoscopic features were consistent with subungal melanoma. There was no palpable lymphadenopathy Figure 1. An initial biopsy of the proximal nail fold was performed. Histologically, an atypical melanocytic proliferation was observed with no features consistent enough with melanoma. After this, the entire nail bed and folds were excised with narrow margins (approximately 2mm) and histopathologic analysis was then consistent with acral lentiginous melanoma in situ, Clark level I, with tumor-free margins. The wound was repaired with a total skin graft. Just four weeks later, a 5mm irregular pigmentation at the distal edge of the scar was observed Figure 2. After histological confirmation of the recurrence, a typical pigmentation was removed with 5mm margin from the nail matrix and the defect was repaired with a total skin graft. Histopathologic analysis showed the margins to be free of tumor.

At a follow-up visit two years later, a linear pigmentation was observed, extending from the proximal right edge of the graft Figure 3. On dermoscopic we could see an irregular pigmentation with different colors, homogeneous brown areas, irregular globules and keratotic areas.

A biopsy confirmed the diagnosis of a further recurrence of acral lentiginous melanoma in situ Figure 4. It was decided to perform staged Mohs surgery with peripheral margin assessment using permanent sections cut horizontally (slow Mohs) Figure 5. In the first stage the previous skin graft with approximately 5mm margin was excised. Proximally, the defect extended near to the distal interphalangeal joint crease Figure 6. Complete tumor clearance was achieved on the second stage. Immunohistochemical stains were used for histopathologic confirmation of the margins Figure 7.

The resultant wound was repaired with a total skin graft with excellent functional and cosmetic results. There is no evidence of...
recognition, difficulties performing satisfactory biopsies of subungual lesions and, occasionally, pathologic misinterpretation of biopsies performed earlier.

The most common clinical clue to the diagnosis of subungual melanoma is the presence of a longitudinal pigmented streak in the nail bed that may extend into the proximal nail fold.

Figure 2 Clinical image corresponding to the second recurrence. A linear pigmentation extending from the proximal right edge of the graft was observed. The recurrence is confined to the graft and no pigmentation could be seen outside the limits of the scar.

Figure 3 Dermoscopy image corresponding to the second recurrence showing irregular pigmentation with different colors, homogeneous brown areas, irregular globules and keratotic areas.

Figure 4 Clinical image after Mohs surgery and wound repair with a total skin graft with excellent cosmetic and functional results.

Figure 5 H/E (×4) subungual melanoma in situ. Asymmetric proliferation of atypical melanocytes along the basal layer that can be seen singly or in nests. Pagetoid spread of single atypical cells is also present.

Figure 6 H/E (×4) Histological analysis of permanent sections after Mohs surgery. Similar histological features to the initial lesion can be seen. There are no areas of vertical growth or cells invading the dermis.

Figure 7 Clinical image showing no evidence of recurrence at follow up 72 months later.

DISCUSSION

Subungual melanoma is among the rarest forms of melanoma, with a low incidence (0.7-3.5% of all melanomas) [1,2]. It is often associated with diagnostic delay and a worse prognosis. The reasons for this typical late presentation include a lack of clinical
Histological features indicative of an in situ lesion can be very subtle\(^1\) and the lesions often have wider invisible extensions at their margin. A recent article reviewed the clinicopathologic features in 124 cases of subungual melanoma in an attempt to provide pathologic clues to diagnosis, especially in early lesions.\(^5\)

Together with melanomas in the head and neck, the subungal area is the most frequent site of melanoma recurrence. The most common location of marginal recurrence after excision of the nail apparatus is the matrix, especially the lateral horns. This is because the lateral edges of the matrix lie in close proximity to the periosteum.\(^2\)

In the histological analysis, the significance of individual melanocytes at the tumor margin that remain after surgical excision is still unclear. It is uncertain whether these single atypical melanocytes will result in regrowth of the tumor [6]. Nor is it known whether the field cells represent the peripheral part of the melanoma or are part of a “field effect”.

In the case of melanomas arising in sun-exposed areas, most studies try to identify features in order to discern melanocytic hyperplasia associated with chronically sun-damaged skin. This “field effect” may result in confusion when evaluating margins of melanoma in situ involving photo damaged skin [6].

Several authors recognize melanocytic hyperplasia as melanoma only when proliferation results in crowding of abnormal cells side by side and they do not excise tissue containing single isolated melanocytes [7-9].

However, in the case of subungal melanoma, there is no demonstrable association between the development of the melanoma and exposure to UV light, and the nail plate acts as a protective barrier.

An analysis by comparative genomic hybridization of single atypical melanocytes beyond the histopathologically diagnosable in situ component of an acral melanoma showed that these cells often harbor similar genetic changes to those of the melanoma [10]. In this study, the authors conclude that acral melanoma is a distinct type of melanoma characterized by focused gene amplifications occurring early in tumorigenesis, and that malignant cells are present beyond the histologically detectable boundary, thereby revealing one mechanism of local recurrence. These cells could represent a lateral expansion of the noninvasive portion. It seems likely that insufficient removal of these field cells could lead to local recurrence. However, the biological potential of these cells needs to be studied further by assessing the association of their presence at the excision margins with later recurrences.

Mohs micrographic surgery could be indicated in the treatment of melanoma, especially for melanomas with poorly defined clinical margins and recurrent melanomas [2,7,8,12]. The use of immunohistochemistry has facilitated the detection of melanocytes and the diagnosis of melanoma on permanent sections, and it can also be used on frozen sections. Most authors have noted a higher sensitivity using the Melan-A antigen in malignant melanoma. MART-1 staining on frozen sections correlates well with MART-1 on permanent sections and enhances the sensitivity and specificity in the detection of atypical melanocytes. Shorter protocols using this staining on frozen sections have been developed [9,14,15].

Several previous cases of recurrent melanoma into the skin graft have been reported. However, in the majority of cases there is only partial invasion of the graft. Selective invasion has rarely been reported.\(^9\) A case similar to ours was reported by Redondo et al. [17]. In this case an acral lentiginous melanoma excised 10 years previously also recurred, with a selective spread into the skin graft from the edge of the excision. As in our case, the recurrent lesion also showed similar histological features to the initial lesion and there were no areas of vertical growth or cells invading the dermis. These authors proposed that the Koebner phenomenon could explain the special tropism of the recurrence toward the graft. Nevertheless, our first hypothesis in this case is the persistence of atypical melanocytes that were not previously excised, especially those located in the lateral horns of the nail matrix.

In summary, we present the case of a recurrent subungal melanoma in situ, which we believe represents another rare case of recurrence arising from the edges of the excision, with special tropism toward the graft. Previous wide excision could not prevent the recurrences until slow Mohs was performed. This case correlates with the hypothesis that a recurrence of melanoma can arise from single atypical melanocytes beyond the histopathologically diagnosable in situ component. We recommend Mohs surgery in these cases, either in paraffin (slow Mohs) or in frozen sections.

REFERENCES

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