

## Nail Matrix Melanoma in situ: Conservative Surgical Management

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### Key Words

Nail matrix · Melanoma in situ ·  
Conservative surgery · Dermatoscopy

### Abstract

**Background:** Nail unit melanoma (NUM) is a rare variant of acral lentiginous melanoma. The differential diagnosis is wide but an acquired brown streak in the nail of a fair-skinned person must be considered a potential melanoma. Dermatoscopy helps clinicians to more accurately decide if a nail apparatus biopsy is necessary. **Methods:** We report the case of a 61-year-old Caucasian woman with melanonychia occupying the central portion of the right thumbnail plate with 1 year of evolution. Dermatoscopy showed a brown pigmentation overlaid by longitudinal irregular lines. An excisional biopsy was performed, and pathological examination revealed melanoma in situ. For safety reasons, the nail unit was totally removed down to the phalangeal bone 3 weeks later, and a full-thickness skin graft taken from the arm was used for reconstruction. **Conclusion:** NUMs pose a difficult treatment challenge. Wide excision with phalanx amputation is not satisfactory for patients with in situ and early invasive melanoma. Full-thickness skin grafting after total nail unit excision is a simple procedure providing a good functional and cosmetic outcome.

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### Introduction

Nail unit melanoma (NUM) is considered a rare variant of acral lentiginous melanoma and represents approximately 1–2% of cases of melanoma in white [1] and 15–35% in dark-skinned ethnic groups [2, 3].

Despite its rarity, when NUM occurs, it may portend a poorer prognosis and lower survival than melanoma of other sites, which has been attributed to the difficulty in establishing an early diagnosis owing to the intervening nail plate alteration of light reflectance or the amelanotic appearance (15–65% of cases). Moreover, melanoma of the nail region is often asymptomatic for a prolonged period. Many patients only notice a pigmentation after trauma to the area, and two thirds seek delayed medical advice because of the appearance of the lesion [4–6]. However, the incidence of melanoma is low in regard of the high frequency of trauma in this location. The high occurrence of NUM in the great toe or thumb might simply be due to the larger size of the nail matrix [3].

Longitudinal pigmentation of the nail is not very common in light-skinned individuals, but the differential diagnosis is wide, including onychomycosis, subungual haematoma and striated melanonychia due to a matrix naevus, but an acquired brown streak in the nail of a fair-skinned adult person must be considered a potential melanoma [7]. The extension of

the pigmentation into the proximal, distal and lateral edges of the nail plate (Hutchinson's sign) is spread of in situ melanoma and indicative of the progression of the disease.

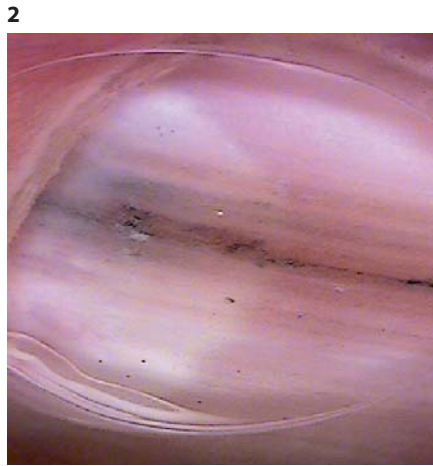
The clinical diagnosis of longitudinal melanonychia may be assisted by dermatoscopy, which can help clinicians to more accurately decide if a nail apparatus biopsy should be performed. However, histopathological diagnosis remains the gold standard in doubtful cases and is the most valuable prognostic tool [4, 8].

### Case Report

A 61-year-old Caucasian right-handed woman presented to our clinic for a pigmented streak extending from the cuticle to the free margin of the right thumbnail with 1 year of evolution. The patient had a history of myocardial infarction and was under anticoagulation. She had no previous alterations of her finger- and toenails. Physical examination revealed melanonychia, 3.5 mm wide, occupying the central portion of the right thumbnail plate (fig. 1). No palpable lymph nodes were found. Dermatoscopy showed a brown pigmentation overlaid by longitudinal lines irregular in their width, spacing and colour (fig. 2). An excisional biopsy was performed by reflecting the nail fold and removing the focus of pigmentation from



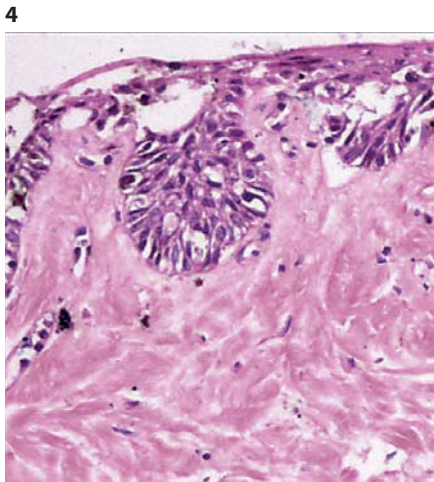
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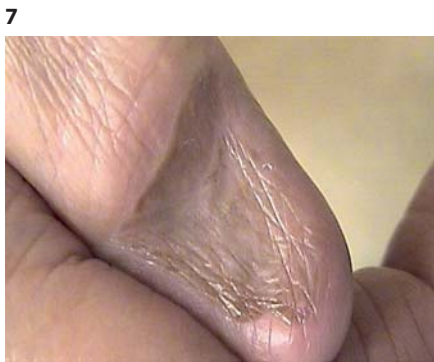
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**Fig. 1.** Right thumbnail longitudinal pigmentation.

**Fig. 2.** Dermatoscopy: brown longitudinal lines irregular in their width, spacing and colour.

**Fig. 3.** Excisional tangential nail matrix biopsy.

**Fig. 4.** Nests of atypical melanocytes in the epidermis. HE.

**Fig. 5.** Total removal of the nail unit.

**Fig. 6.** Reconstruction of the finger using a full-thickness skin graft taken from the right arm.

**Fig. 7.** Clinical aspect at 1-year follow-up.

the matrix by horizontal excision with a 3-mm safety margin (fig. 3). Histopathological examination revealed melanoma in situ with free margins (fig. 4). Because of this diagnosis, the nail unit was totally removed down to the phalangeal bone 3 weeks later (fig. 5), and a full-thickness skin graft taken from the right arm was used for reconstruction (fig. 6). The heal-

ing was complicated by blood imbibition of the graft; however, it took completely without any graft necrosis. Histopathological examination revealed that the nail unit was free from melanoma cells.

After a follow-up of 1 year, the patient has no evidence of local recurrence or metastasis, and thumb function was completely preserved (fig. 7).

## Discussion

NUM is frequently more advanced than other melanomas at the time of diagnosis. Consequently, traditional surgical intervention for this type of malignancy has focused predominantly on radical surgery, namely phalanx amputation. Nonamputative excision has been rarely

advocated in the surgical literature [4, 9–12].

A biopsy is recommended for every longitudinal melanonychia acquired after puberty in fair-skinned individuals or in the presence of longitudinal melanonychia showing rapid and progressive growth [2, 13, 14]. The use of non-invasive techniques such as dermatoscopy is valuable for the better selection of cases in whom a pathological examination is indicated [5, 15].

The presence of a brown pigmentation wider than 5 mm and overlaid by longitudinal lines irregular in their thickness, spacing, colour or parallelism is highly in favour of a melanoma. Dermatoscopic examination of the free edge of the nail plate gives information on the lesion location: pigmentation of the dorsum of the nail plate is in favour of a proximal nail matrix lesion, whereas pigment in the lower part of the nail edge is in favour of a lesion of

the distal matrix [16]. Dermatoscopic examination of the nail bed and matrix enables the visualization of pigmentation directly in its original site, revealing aspects not observed when the nail plate is interposed between the pigmented lesion and the dermatoscope. However, no correlation was found between the structures observed directly in the matrix and standard dermatoscopic findings in the nail plate [17].

Melanoma management requires consideration of oncological and reconstructive surgical principles to optimize the likelihood of cure and quality of life [12, 18]. NUMs pose a difficult challenge because of the lack of surrounding tissue. Wide excision with phalanx amputation is considered a first-line therapy [18]; however, it is not satisfactory for the patients and has not shown prolongation of disease-free survival, in particular in early

cases [2]. The use of tissue-sparing Mohs micrographic surgery for thin NUMs is an alternative that has potential benefit in avoiding amputation. However, it is not available in all centres [4].

A high suspicion index is mandatory in cases of NUM. The clinical diagnosis should be helped by tools such as dermatoscopy, which may contribute to decide if the lesions need biopsy. Only an early diagnosis can achieve a better outcome.

Full-thickness skin grafting after total nail unit excision is a simple procedure which provides a good cosmetic and excellent functional outcome and does not produce significant donor site morbidity [1, 12, 13]. We propose this procedure for a first therapeutic option in cases of NUM in situ. Alternatives are the more demanding cross-finger flap and abdominal skin glove flap, which are at least 2-step procedures.

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