

CASE REPORT

Use of Integra for thumb length conserving surgery for an acral melanoma in-situ

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Background

Acral melanoma (AM) is an uncommon subtype of melanoma and has traditionally been managed with amputation of the affected digit, even in cases of in-situ disease. Such an approach may result in significant functional and psychological morbidity, particularly in elderly patients.

Methods

We report the case of an 80-year-old gentleman who presented with an AM in-situ affecting the left thumb, which had been present for over 20 years. Following refusal of amputation, a conservative surgical approach was undertaken. A degloving procedure was performed, and reconstruction was achieved using a dermal regeneration template (Integra®).

Results

Despite the technical and oncological limitations associated with conservative management, the patient achieved a functionally and aesthetically satisfactory outcome, with preservation of thumb length and function.

Conclusion

Although amputation of the affected digit has historically been recommended for AM, this case highlights that, in carefully selected patients with in-situ disease, a more conservative surgical approach may be a viable alternative. Such an approach may allow adequate disease control while preserving function and improving quality of life.

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Acral melanomas (AM) are a subtype of cutaneous malignant melanoma occurring on the hands and feet (palms, soles, fingers, toes, and nail units). As a result of their location, diagnosis is often delayed thus these tumours tend to present at a more advanced stage. Additionally, they pose a challenge for surgeons as considerations for functionality and cosmesis must be balanced with acquiring the recommended clinical surgical margins (eg 0.5cm margin for melanoma in situ, 1cm margin for invasive melanoma with Breslow thickness <1mm) since this type of melanoma is associated with higher local recurrence rates.¹

CASE PRESENTATION

An 80-year-old gentleman presented to our dermatology department in August 2021 with a 20-year history of a slowly growing pigmented lesion over his left thumb. For many years, his pastime was developing photos and as a result he mistook the lesion to be a patch of ink thus failing to seek medical attention beforehand. He denied any bleeding, oozing or pruritus from the lesion. His past medical history was significant for hypertension on perindopril and bendroflumethiazide.

Examination revealed a pigmented macule with irregular borders roughly 2.5cm in diameter and involving the dorsal, medial and ventral aspects of the distal phalanx of the left thumb. The nail plate appeared grossly normal (**Figure 1**). Dermoscopic findings were highly suggestive of malignant melanoma with asymmetric colour and structure as well as an irregular, thickened pigment network. Axillary lymph nodes were not palpable. Two 3mm punch biopsies were taken; one from the medial edge of the distal phalanx and another from the pulp of

the left thumb, both of which showed a melanoma in-situ, with no dermal invasion.

The management options offered to the patient at this point included wide local excision or possibly off-label use of topical imiquimod. Topical imiquimod is most often used for select lentigo malignas, usually located on the head or neck area, where surgery is deemed inappropriate, and would not be a first line treatment of acral lesions in otherwise healthy patients, due to poorer clearance rates.² The patient was therefore referred to plastic surgery to discuss the various surgical treatment and reconstructive options.

For early acral melanoma located on the digits, wide local excisions have been shown to have a similar prognosis compared to amputations,³ so given the functional and aesthetic implications of a thumb amputation, the patient was offered a “degloving procedure” followed by reconstruction with a dermal regeneration template (Integra®), with consideration to proceeding to amputation if a significant invasive component was noted on the final histology report. Other reconstruction options such as abdominal or groin flaps were deemed unsuitable due to the possibility of invasive disease present in the rest of the lesion, with a risk of seeding to donor sites.

The patient categorically refused amputation and subsequently underwent local excision of the melanoma in-situ with a 0.5cm margin by the plastic surgeons, with degloving of the left thumb at the level of the interphalangeal joint and excision of the nail plate. This was followed by application of Integra®, that was doubled over at the distal aspect to provide more tissue cover. The surgery was carried out under a digital block. There were no intraoperative or postoperative complications and

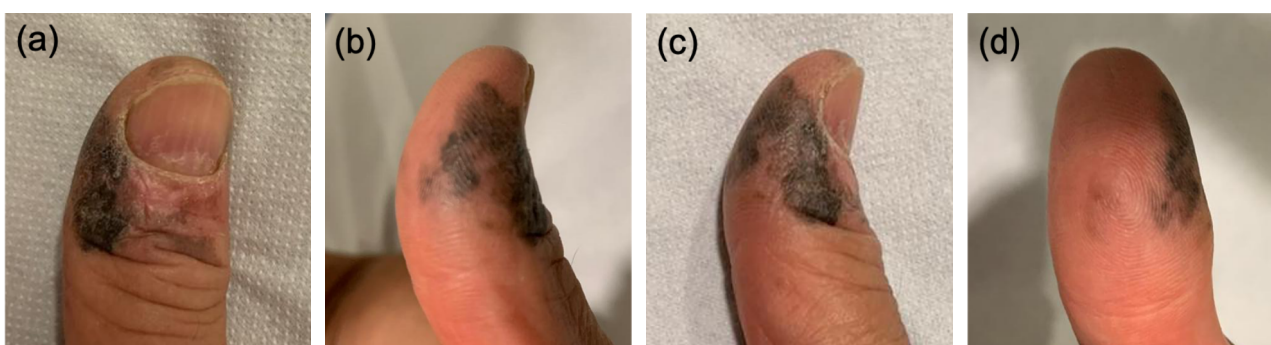


Figure 1 (a-d) Photos of the acral melanoma in-situ at presentation.

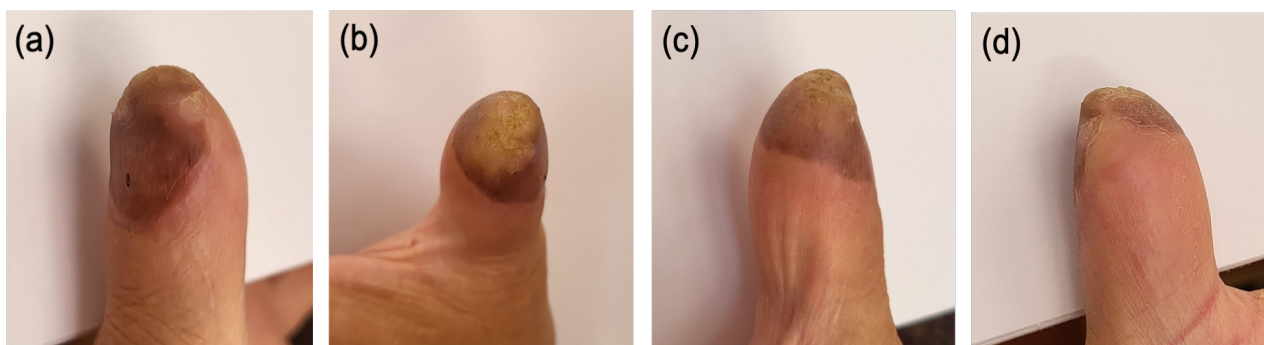


Figure 2 (a-d) Appearance at sixteen weeks after Integra® repair.

the patient was discharged home on a seven-day course of co-amoxiclav and pressure dressing.

In the meantime, the excised nail plate and distal portion of the left thumb were sent for histology and confirmed complete excision of the melanoma in-situ with no evidence of invasive malignancy in the nail plate and nail matrix. Moreover, a clearance of 6mm from the skin resection margin was observed. Three weeks later, a split thickness skin graft was applied over the Integra® and the patient was followed up regularly by the plastic surgeons and again at our department sixteen weeks later (Figure 2). He was very pleased with the results as he was able to maintain functionality of his left thumb with good cosmesis and only slight length discrepancy.

DISCUSSION

With regards to the treatment of AM located on a digit, amputation of the affected digit was the previous recommended course of action. Nevertheless, a retrospective study by Roh et al compared the incidence in local recurrence and overall survival in the group of patients undergoing amputation with those undergoing limited excision. No significant difference was found and in fact, an improved survival was noted in the latter group.³

With the advent of more conservative surgical techniques, the use of reconstructive measures including acellular dermal regeneration templates has increased. Integra® is a bilaminar dermal regeneration template, containing a matrix composed of glycosaminoglycans derived from shark chondroitin-6-sulfate and bovine collagen which is covered by a protective silicone sheet. The latter acts as an artificial epidermis protecting the wound from infection as well as heat and moisture loss. The inner

layer can stimulate the formation of a vascularised dermis in wounds with exposed bone or tendon and those having undergone radiation thus providing a higher quality coverage compared to other reconstructive options. For this reason, the use of Integra® has been recommended in the closure of wounds secondary to traumatic degloving injuries, burns and complex cancer resections with excellent patient satisfaction and post-operative functional recovery.⁴ That being said, degloving procedures in the management of acral skin cancers were seldom reported in the literature. In a case by Proietto et al, an acral melanoma in-situ was excised via “surgical degloving” and reconstruction was successfully performed by means of a radial antebachial flap.⁵

Furthermore, several complications are associated with the use of Integra®, the commonest of which is infection. Since Integra® has no intrinsic antibacterial qualities, meticulous wound preparation and haemostasis is essential. Other complications include haematoma or seroma formation, wound breakdown and delayed immunological reactions.^{6,7}

Finally, this case was intriguing since the melanoma in-situ was initially presumed to be a discolouration secondary to the photo developing liquid hence the delay in presentation and increase in size of the lesion. One of the main constituents of this liquid is hydroquinone; however, despite inhibiting melanin synthesis, it has not yet been shown to have any inhibitory or stimulatory effect on melanomas.

Based on our experience, we agree that it may be possible to consider a more conservative surgical approach to AM treatment of the digit, especially in the case of in-situ tumours. We are happy that we managed to achieve a functionally and aesthetically-satisfactory result for our patient while providing complete excision of his acral melanoma in situ.

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