

Radical Resection with Plantar Foot Reconstruction by Split Thickness Skin Graft for Acral Lentiginous Melanoma

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Statement of Purpose

Acral Lentiginous Melanoma (ALM) is one of four Cutaneous Melanoma subtypes that occurs on the acral skin. Due to its often aggressive nature, characteristic delays in diagnosis, and locations of presentation it often requires complex surgical approach. Plantar foot defects after resection of ALM lesions have shown poor response to split thickness skin grafting (STSG) when used in the heel or distal plantar area¹. This single case study demonstrates a case of advanced ALM that healed well following STSG.

Literature Review

An upwards of 7% of cutaneous melanomas are found at acral sites². It is characterized as a lentiginous growth phase evolving over months or years to a dermal invasive stage³. It generally occurs later in life with the peak incidence in the seventh decade of life². Although the least common of the four subtypes in the Caucasian population it accounts for the most common subtype of melanoma in those of African and Asian decent⁴. It frequently presents in an older population who have fewer atypical nevi and have personal or family history of non-cutaneous malignancies⁴. Of note, the most common site for ALM to occur is on the sole of the foot⁵, which is believed to play a significant role in its commonly delayed diagnosis. These delays in diagnosis can often be two-fold both on the part of the patient as well as the physician. Soon et al. reported a case series of 112 plantar ALM's where 33.9% had been previously misdiagnosed, 60% of which were amelanotic while 39% resembled benign hyperkeratotic lesions⁶. On the other hand, in a study by Richard et al. examining a population of 590 melanomas only 24.8% of patients were aware of the seriousness of melanoma, with many under the assumption that a lesion could not be cancerous if they had not experienced bleeding or fatigue, thereby persons who did seek urgent consultation were those who had late warning signs of this disease and ultimately a poorer prognosis⁷. The ABCDE criteria can be used as a method of melanoma detection [Fig. 1]. Despite methods developed to aid in the detection of melanoma, ALM can often exhibit an appearance outside of these constructs leading to it being discovered later than other melanoma subtypes and even go misdiagnosed completely.

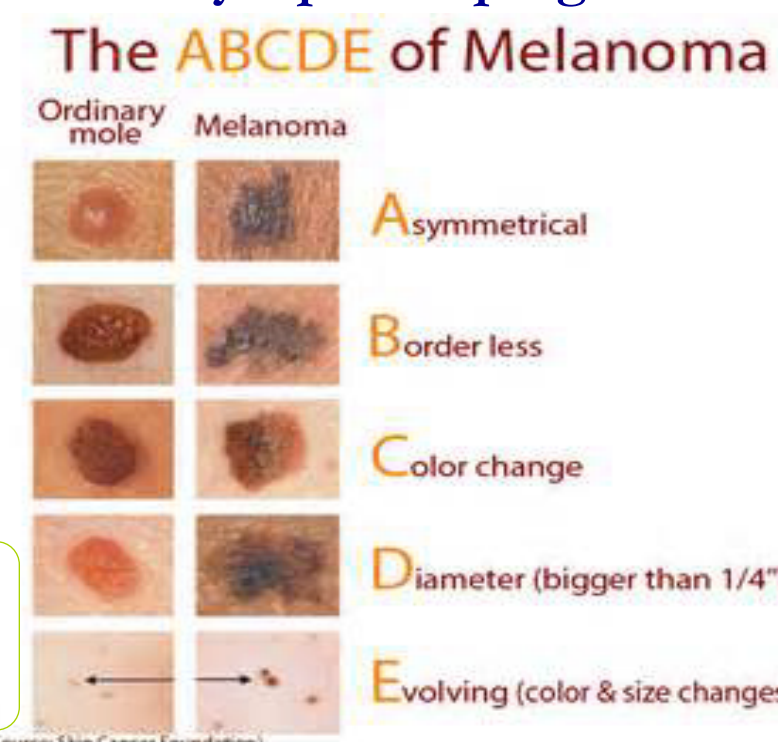


Figure 1. ABCDE of Melanoma

Literature Review

In the setting of plantar foot ALM, its regularly late diagnosis, aggressive behavior, and site of presentation often leads to large excisional defects of the plantar foot which becomes challenging from a standpoint of surgical excision and subsequent reconstruction. Options for reconstruction of plantar ALM lesions can vary by location but general surgical consensus advocate for local flap and full thickness grafting as STSG have shown "dismal" results when used in the weight bearing areas of the plantar skin⁴.

Case Study

In July of 2016 a 77-year-old African American female with past medical history of Diabetes Mellitus Type II and Peripheral Neuropathy presented to the office of author K.D. with rapidly growing mass on the ball of her left foot. She noted the mass for the first time approximately 1.5 months prior to her presentation. She did not recall any lesions, moles, or freckles in the area of the mass prior to noticing its growth. Over the prior 2 weeks the mass started bleeding and on advisement of her daughter she made the decision to seek medical advice. The mass was black and dark grey in color with irregular round shape and lobulated borders. It was 2.5cm round in diameter and raised approximately 1.2cm from the level of the plantar skin. Secondary to this there was a 4.5mm round flat black mole 3cm lateral to the mass. Radiographs were inconclusive for bony involvement [Image 1]. Based on the exam findings it was recommended that the mass be excised for biopsy, which the patient was amendable to.



Image 1



Image 2

The mass was excised 7 days from initial presentation [Image 2], it was noted at that time to have central stalk in communication with the deep plantar soft tissues. The biopsy revealed Acral Lentiginous Melanoma, invasive to the reticular dermis, at least 8mm. Prognostic marker BRAF mutation was found to be negative. The results were communicated with the patient and her daughter the same day and she was referred to Plastic Surgery service for wider and deeper excision. She was also sent for CT of chest and abdomen the following day, which showed no clear evidence of metastasis.

Case Study

The patient underwent radical resection of the left plantar foot 3 days after the biopsy proven diagnosis by author J.L. [Image 3]. The surface resection consisted of 2cm borders taken from all areas of confluence with the resected mass and with deep resection to the level of the plantar fascia. The defect was grafted by split thickness autograft taken from the ipsilateral thigh [Image 3]. She was admitted the same day for postoperative management. The biopsy segment [Image 3] resulted the following day revealing clear margins with no evidence of residual invasive melanoma confirmed by HMB-45 stain. The patient was discharged with outpatient follow up with author J.L. for on going wound care and medical oncology.



Image 3

From August 2016 through April 2017 the patient routinely presented to the Wound Care Center at Brandywine Hospital for wound care until full healing and a plantargrade foot was documented, an abbreviated representation of wound healing can be referenced in [Image 4]. During this time she was continually counseled on the need to follow up with medical oncology, despite this the patient continued to defer the recommendation. In January of 2017 the patient had a whole body PET CT which revealed two hypermetabolic enlarged lymph nodes in the left inguinal region compatible with metastatic disease, remainder of the body showed no signs of metastatic infiltration. The findings were conveyed with her and family however patient continued to refuse consultation with oncology.



Image 4

Case Study

In March 2017, within 3 weeks of her last wound care visit and documented healing, the patient presented to her primary care physicians office with complaint of worsening shortness of breath over the prior two weeks. She was found to have a pulse oximeter reading of 88% and was directly admitted for full workup. During this admission a chest CT revealed extensive bilateral pulmonary emboli and bilateral lung lesions consistent with Tumor Emboli Syndrome. A biopsy of her pleural fluid was positive for metastatic melanoma. Medical oncology was consulted however at that time patient requested hospice care and was discharged with home hospice care. She passed within five weeks of discharge from the hospital.

Analysis & Discussion

This case details a large plantar defect following radical resection of a stage IV ALM treated by STSG to full healing. Despite a majority of literature advocating full thickness and local flap grafting for plantar ALM this case demonstrated a favorable aesthetic outcome by use of STSG. The patient's presentation is also in line with recent literature as she presented only after family suggested it, and demonstrated poor understanding of malignant warning signs⁵. Seeing as ALM is often mistaken for other conditions commonly seen by Foot and Ankle Specialists (i.e. non-healing wounds, warts, fungal infections, granulomas or hematomas)⁴ these physicians should be well versed in its clinical presentation and an understanding of modalities for diagnosing and treating these patients. The local reoccurrence of adequately resected ALM is also no higher than that of superficial spreading melanoma (SSM)⁴ so a hasty initial diagnosis and treatment could lead to lower morbidity and mortality rates overall. Patients with ALM have demonstrated 5 & 10 year survival rates of 80.3% & 67.5% respectively which is significantly worse than SSM and Nodular Melanomas (NM) which is 91.3% & 87.5% respectively⁴. These differences and the aggressive nature of ALM suggest the need for better screening during routine physical exams. Unfortunately, just as the patient in this case study, delays to diagnosis of ALM can often be driven by the patients themselves so additional emphasis should be placed on advocating for patient targeted education for populations that have been shown to be of higher risk for ALM.

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