Pedal Melanotic Schwannoma: A Case Report

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Introduction

Schwannomas are solitary, slow-growing, and encapsulated benign soft tissue neoplasms composed of differentiated neoplastic Schwann cells [1]. These soft tissue tumors are thought to arise sporadically [2]. A melanotic or melanocytic schwannoma is a rare variant of a schwannoma that typically involves spinal nerve roots [1,2]. However, it can present at other anatomic locations. Melanotic schwannomas share particular ultra-structural features of Schwann cells. These features include a well-developed basal lamina, plentiful pinocytic vesicles and interdigitating cytoplasmic processes [3]. The most common location of a melanotic schwannoma is either the posterior spinal nerve roots or the paraspinal sympathetic chain [1,4]. Please see Table 1 for a comparison of a schwannoma and a melanotic schwannoma.

This rare pigmented nerve sheath tumor was first described in 1932 by Millar [4]. Macroscopically, it appears brown or black due to the presence of pigmented melanin [4]. Microscopically, it shows characteristics of uncommon variants of nerve sheath tumors with melanocytic differentiation [4]. It is believed that melanotic schwannomas have the ability to synthesize melanin potentially because both Schwann cells and melanocytes are derived from migrating neural crest cells [1]. Following resection of this tumor, local recurrence is rare [5]. Complete resection of this tumor is recommended to prevent recurrence.

Case Report

A 78 year old Caucasian female presented to a physician’s office with complaints of onychomycosis. Incidentally, it was noted that the patient had large a mass on the plantar aspect of her right foot. She denied any complaints regarding the mass. The mass had been present for approximately one year and was slowly increasing in size. An MRI revealed a heterogeneous macrolobulated mass measuring 3.0 × 8.3 × 5.3 cm and could not rule out malignancy. A surgical biopsy was then performed.

**Conclusion:** Melanotic schwannomas have the ability to mirror malignancy, both on physical exam and on advanced imaging modalities. A biopsy procedure provides a definitive diagnosis and contributes to the definitive treatment plan.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Schwannoma (Benign Majority)</th>
<th>Melanotic Schwannoma</th>
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</thead>
<tbody>
<tr>
<td>Common Location</td>
<td>Peripheral Nervous System</td>
<td>Nerve Roots and Paraspinal Chain</td>
</tr>
<tr>
<td>Pedal Occurrence</td>
<td>Rare</td>
<td>Exceedingly Rare</td>
</tr>
<tr>
<td>Melanin</td>
<td>None</td>
<td>Cytoplasmic</td>
</tr>
<tr>
<td>Cytoplasmic Processes</td>
<td>Interdigitating</td>
<td>Interdigitating</td>
</tr>
<tr>
<td>Basal Lamina</td>
<td>Well Developed</td>
<td>Well Developed</td>
</tr>
<tr>
<td>Pinocytic Vesicles</td>
<td>Plentiful</td>
<td>Plentiful</td>
</tr>
</tbody>
</table>

Table 1: Comparison of schwannoma to melanotic schwannoma.
site. An additional surgical procedure, wound excision and rotational flap closure and local wound care healed the wound within four months of the initial surgical procedure. At her subsequent appointments, the patient did not report any issues or additional complications following the removal of the pedal melanotic schwannoma.

**Discussion**

Melanotic schwannomas are a distinguished entity from...
conventional schwannomas. The gray-brown pigment occasionally seen in conventional schwannoma represents lipofuscin opposed to true melanin [1]. Although nerve roots and the paraspinal sympathetic chain are the most frequent locations of melanotic schwannomas, they may present at various anatomic locations [1,2]. However, their presence in the foot is extremely rare with very few cases published in the literature. The appearance of this tumor on clinical exam and on surgical evaluation may mirror a malignant lesion. Wide excision of a melanotic schwannoma is recommended to prevent growth and reoccurrence of the lesion.

Conclusion

Melanotic schwannoma is a benign rare variant of a conventional schwannoma that has the ultrastructural features of Schwann cells. Additionally, it is composed of melanin-producing cells. Comparable to a schwannoma, it is a slow-growing space occupying lesion. The presence of this tumor is exceedingly rare in the foot. An x-ray of the mass is a first line imaging study. It can reveal if there is any osseous involvement associated with the mass. An advanced imaging study, such as an MRI, is needed to reveal the extent and characteristics of the mass. These characteristics aid with diagnosis of the lesion. However, imaging studies performed on a melanotic schwannoma may be inconclusive and can mirror malignant masses. The ideal diagnosis for this tumor includes biopsy, if advanced imaging studies are inconclusive. If advanced imaging studies are conclusive or after the results of the biopsy return, complete wide excision of the tumor is recommended for treatment.

References