

It's Not Always What You Think It Is—A Case of a Thumb Mass Found to Be a Schwannoma

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Abstract

Soft tissue tumors in the hand have a broad differential diagnosis. Included in the list of differential diagnoses for these tumors are Schwannomas, which are benign tumors within the peripheral nervous system [1]. Schwannomas are uncommon within the upper extremity, and they are exceedingly rare within the hand and wrist [1]. We describe a case of an 80-year-old female presented with a soft tissue mass within her right thumb. She underwent excisional biopsy of the mass, and pathology showed features consistent with schwannoma. She had resolution of her symptoms thereafter. We discuss the differential diagnosis for soft-tissue tumors in this location. When assessing patients with soft tissue tumors of the hand and wrist, it is important for the treating provider to maintain a broad differential diagnosis in order to facilitate appropriate management of these lesions.

Keywords

Masses, Tumors, Schwannoma, Thumb, Upper Extremity

1. Introduction

Soft tissue masses within the upper extremity may present a diagnostic challenge. Schwannomas, an uncommon tumor, should be included in the differential diagnosis [1]. These benign masses are found along the peripheral nervous system and are caused by increased proliferation of Schwann cells, which are responsible for the production of the myelin sheath [2]. They are associated with Neurofibromatosis Type 2, however may also occur in isolation [3]. The incidence of schwannomas in the upper extremity is rare; they account for just 5% of upper extremity soft tissue masses and 2.8% of biopsy specimens of benign soft tissue tumors in

the hand and wrist [1] [4].

Schwannomas are characterized by a pattern of slow growth [4]. Patients typically present with a slow-growing painless mass, which can take years to be diagnosed and excised [5]. Constitutional symptoms or neurologic symptoms are typically not present. We report a case of an 80-year-old female who underwent surgical excision of a soft tissue mass in her right thumb, ultimately diagnosed as being a schwannoma. Informed consent was obtained for publication of this case report including clinical and intraoperative imaging.

2. Case Presentation

An 80-year-old right-handed female presented to our hand surgery clinic for evaluation of a bothersome mass on her right thumb. The mass had been present for several years and had gradually increased in size. She denied numbness, tingling, or antecedent trauma. She denied other similar lesions elsewhere on the body. She had a history of well-controlled hypertension and was otherwise healthy.

On physical examination, she had a well-circumscribed mass measuring approximately 1.5 cm × 1.5 cm located along the palmar aspect of the right thumb (**Figures 1(a)-(c)**). The mass was tender to palpation. The mass was firm and mobile in nature. There were no overlying skin changes, and the skin and subcutaneous tissues did not appear to be adherent to the mass. The thumb was warm and well perfused. The patient had intact sensation to the radial and ulnar digital nerve distributions of the right thumb.

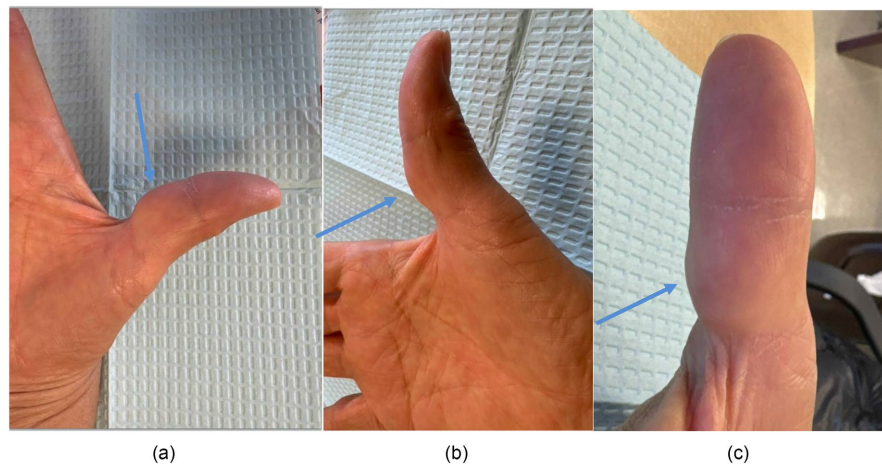


Figure 1. Clinical photos of the patient's right thumb demonstrating a 1.5 cm × 2 cm mass located along the palmar aspect at the level of the proximal phalanx (blue arrow). The mass was well-circumscribed and mobile in nature.

Plain radiographs of the patient's right thumb revealed soft tissue prominence overlying the proximal phalanx without any underlying bony abnormality (**Figure 2(a)** and **Figure 2(b)**). No further imaging was obtained. Given the patient's clinical findings, our differential diagnoses at the time included a ganglion cyst and lipoma. Treatment options were discussed with the patient, including observation

or surgical excisional biopsy. Risks, benefits, and potential complications were discussed, with an emphasis on potential injury to surrounding structures such as nerves. The patient was counseled that without surgical excisional biopsy, the mass may continue to grow slowly and experience more discomfort. Excisional biopsy offers the benefits of a diagnosis and well as potential alleviation of discomfort. Understanding the risks and benefits of each and given the progression of size of the mass and associated discomfort, the patient elected to proceed with excisional biopsy.

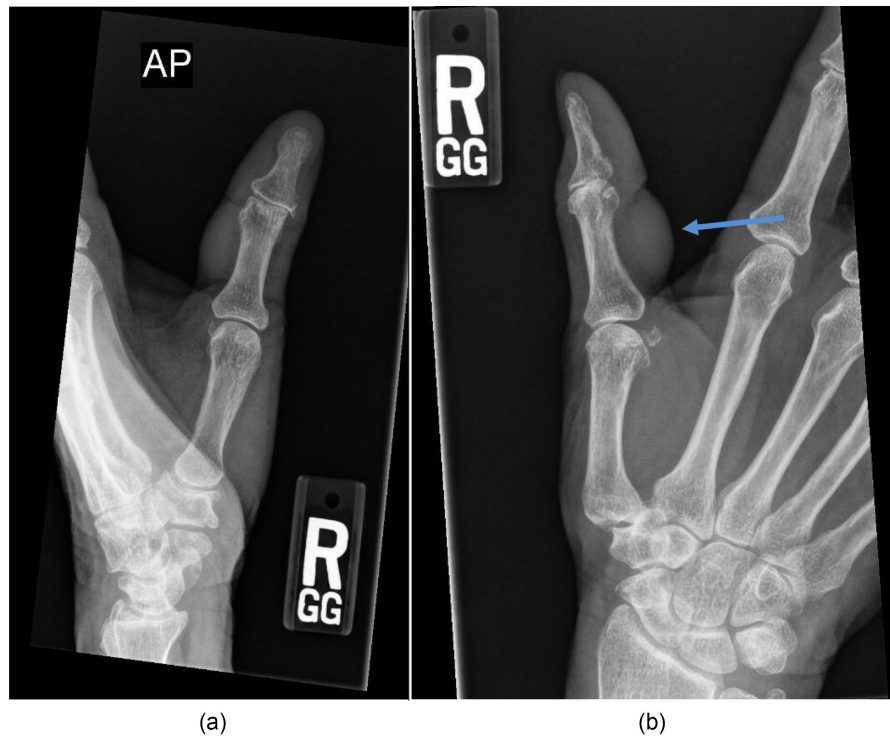


Figure 2. Plain radiographs of the patient's right thumb demonstrating a soft tissue mass overlying the proximal phalanx, most notably on the lateral projection of the thumb (blue arrow). No other bony abnormalities corresponding to the area of concern were noted.

The patient was placed in the supine position and a tourniquet was placed on the right upper extremity. The right upper extremity was carefully prepped and draped using appropriate sterile technique. The limb was exsanguinated and tourniquet inflated. A 3 cm oblique incision was made overlying the mass in order to be extensible if warranted. Careful dissection through the skin and subcutaneous tissues under loupe magnification revealed a 1.5 cm × 1.5 cm mass intimately associated with the radial digital nerve (**Figure 3**). The mass was carefully dissected free from the radial digital nerve of the thumb, which remained in continuity following excision (**Figure 4** and **Figure 5**). The mass was subsequently sent for pathology in entirety. The wound was irrigated and skin edges were reapproximated with monofilament suture. The patient was placed in soft dressings and allowed to perform activities as tolerated post-operatively.



Figure 3. Intraoperative photograph demonstrating a well-circumscribed mass (orange arrow) intimately associated with the radial digital nerve (green arrow) of the patient's right thumb.



Figure 4. Clinical photograph of the soft tissue mass following surgical excision. Note that the mass appears to be well-circumscribed in nature.



Figure 5. Intraoperative photograph demonstrating interval removal of the soft tissue mass with the remaining radial digital nerve (light green arrow) in continuity.

At two weeks post-operative, the patient noted intact but slightly diminished sensation along the radial digital nerve distribution of the thumb. The patient was able to actively flex and extend at the metacarpophalangeal and interphalangeal joints of the thumb with full strength. The thumb remained well perfused. Histopathology showed cellular nodules of bland spindle cells alternating with less cellular myxoid areas and Verocay bodies, diagnostic of schwannoma (**Figures 6(a)-(d)**). The patient ultimately returned to activities and was satisfied with her overall outcome.

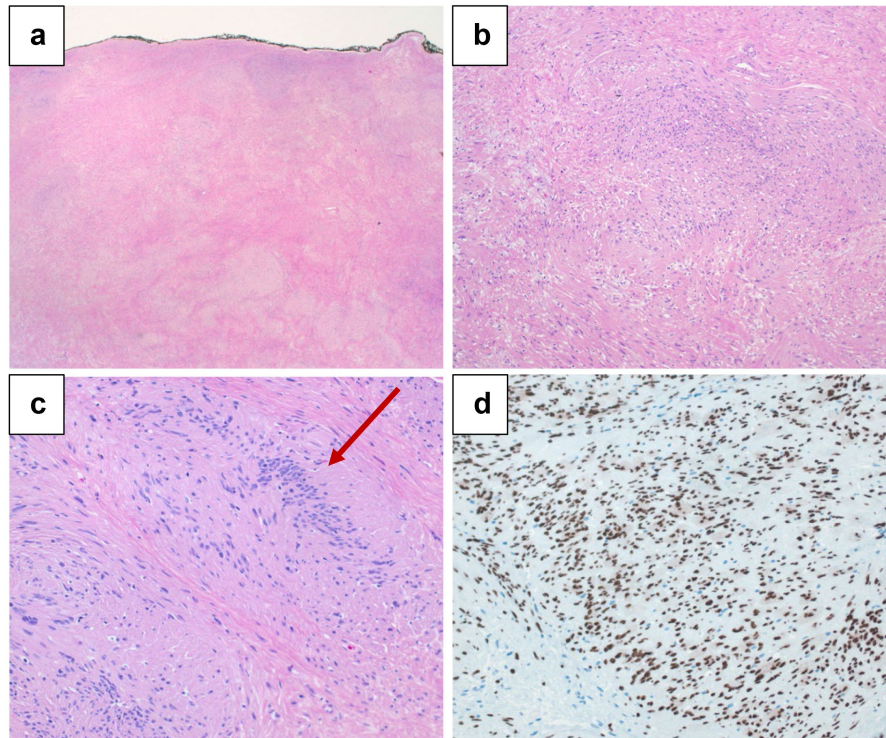


Figure 6. The tumor is bounded at least partially by a capsule ((a), 40× magnification) and shows multinodular architecture with cellular nodules of bland spindle cells alternating with less cellular myxoid areas. Higher magnification ((b) 200×) highlights the spindle cells with undulating nuclei arranged in a fascicular pattern. Verocay bodies (red arrow) are present ((c), 200×). The tumor cells strongly express SOX10 (d) a marker of neuroectodermal derivation.

3. Discussion

More commonly found in the head and neck, schwannomas are uncommon soft-tissue masses in the hand [4] [5]. When they arise on the forearm, wrist, and hand, they are usually located on the volar surfaces due to an increased density of nerve fibers in these regions [4]. Imaging modalities used to diagnose schwannomas may include ultrasound and magnetic resonance imaging (MRI). On ultrasound, characteristic findings include a well-defined mass that runs in proximity to a peripheral nerve [6]. The mass is typically hypoechoic and has vascularity on doppler imaging [7]. On MRI, schwannomas appear well-defined from adjacent

structures [6]. A “target sign” or “split fat” sign may also be identified on MRI [6]. Histologically, schwannomas may have a varied appearance, but classically consist of Antoni type A cellular fascicular arrangements of spindled cells, often present in a palisading pattern (Verocay bodies) admixed with looser arrangements of similar appearing Schwann cells in a myxoid background (Antoni type B) [5] [8].

Prior to excision, the mass on the patient’s right thumb was favored to be benign given its well-defined and mobile nature, along with the lack of overlying skin abnormalities. This is based on a prior report that found 95% of soft tissue tumors in the hand without overlying skin abnormalities to be benign [9]. The initial differential diagnosis for the above patient before surgery included a ganglion cyst or lipoma given the well-circumscribed and mobile nature of the lesion. Other diagnoses should be considered in the evaluation of benign soft tissue masses, including epidermal inclusion cyst, giant cell tumor of tendon sheath, neurofibroma, and vascular tumors (*i.e.* glomus tumor or vascular malformations) [10]. Of note, clinical signs and symptoms of schwannomas may resemble those of neurofibromas. However, neurofibromas intertwine with the peripheral nerves, which increases a patient’s risk of iatrogenic injury during excision [11]. Thus, nerve repair or grafting may be warranted. This is in contrast to schwannomas, which display a more eccentric location in the nerve and are more easily removed [10]. On histopathology, neurofibromas demonstrate elongated Schwann cells, fibroblasts, and perineural-like cells that are intermixed with nerve fibers, collagen, and mucin—contrasting the biphasic pattern seen in schwannomas [10] [12]. Thus, surgical characteristics and histopathology are critical in differentiating these two closely related nerve sheath tumors.

Obtaining additional imaging such as ultrasound or MRI in the above case was considered. However, this was deferred as the size of the mass was less than 2 cm and no other atypical features (*i.e.* pain at night, irregular borders, constitutional symptoms) were present [13]. Although re-excision of a potentially malignant tumor was a possibility, contamination appears to be less significant in smaller masses and closed techniques of biopsy are more challenging due to close proximity to neurovascular structures [13].

After surgical excisional biopsy of the patient’s mass, she had mild residual paresthesias in the radial digital nerve distribution. At the time of surgery, the radial nerve was identified, protected throughout the procedure, and found to be intact prior to wound closure (Figure 5). Thus, she likely sustained a neuropraxia to the radial digital nerve during excision of the mass. Post-operative neurological deficits are a common complication following Schwannoma excision—with a reported incidence of 60 - 70 percent [14] [15]. When considering excision of benign soft tissue masses in the hand, providers should emphasize the risk of injury to surrounding structures including nerves. Of note, risk factors for worse functional outcomes include larger mass size and more proximal location [15].

4. Conclusion

Soft tissue tumors of the hand pose a diagnostic and therapeutic challenge. The

differential diagnosis is broad, and should include peripheral nerve sheath tumors such as schwannomas. We present the case of an 80-year-old female with a progressively enlarging and tender mass at the palmar aspect of the right thumb. She underwent surgical excisional biopsy, and the mass was found to be a Schwannoma by pathology. She had a post-operative neuropraxia of the radial digital nerve, and the patient had a favorable overall outcome. It is critical for providers to exercise the appropriate diagnostic work-up based on the history and clinical/radiologic characteristics of the mass. If surgical excision is pursued, appropriate oncologic principles should be kept in mind with caution to avoid excessive iatrogenic injury to surrounding structures.

Conflicts of Interest

The authors have no financial disclosures or conflicts of interest.

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