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Case Report

Schwannoma of the plantarmedial aspect of the foot: A case report

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ABSTRACT

Schwannomas of the common medial plantar nerve branch are rare solitary nerve sheath tumors. Fewer than a dozen cases have since been described in the literature, most of which were initially misdiagnosed as ganglion cysts. The case of a 56-year-old male who developed a painful mass on the plantar medial hallux, misdiagnosed as a ganglion cyst, is presented. After surgical intervention and pathological analysis the patient was diagnosed as having a schwannoma. A schwannoma is a slowly growing neoplasm of Schwann cell origin. It is very rare for a schwannoma to transform into a malignant lesion and usually occurs in individuals between the ages for 20-50. Schwannomas usually have a predilection for the head and upper extremities and is very rare in the foot and ankle. The principal treatment of a schwannoma is surgical excision, which eliminates symptoms and can correctly diagnose the mass. Even though schwannomas of the foot have been reported in literature, this case demonstrates an abnormal location on a branch of the medial plantar nerve.

Level of Clinical Evidence: Level 4 of Evidence.

1. Introduction

A schwannoma is a rare benign tumor that is derived from the myelin sheath of nerves. It is commonly seen in patients between the third and fifth decades of life, with no racial or sexual predilection [1]. While most Schwannomas affect the head and neck region, localization to the lower extremity especially the foot is rare [2]. In the lower extremity, schwannomas are most commonly located in the deeper tissues of the foot. Most schwannomas present as tender nodules associated with neurogenic pain or paresthesias. It is very uncommon for schwannomas to transform into a malignant tumor, but surgical excision is usually indicated to eliminate the patient's symptoms and to properly diagnosis the tumor [3,4]. Pathology report confirms schwannoma with H&E stain and subsequently reaffirmed with positive S-100 protein stain. This case report describes a unique case of a schwannoma in the plantar medial aspect of the foot in a 56 year old male.

2. Case report

A 56-year-old male with controlled hypertension, and hyperlipedmia presented to the clinic in June 2013 with complaints of left foot pain and swelling. He related a history of progressively increasing pain and swelling over the past few months, and a palpable mass proximal and plantar to the head of the metatarsal phalange joint (MTPJ). A previous foot and ankle surgeon had made the diagnosis of a ganglion cyst, and recommended conservative treatment, which included: more accommodative shoe wear, padding, and non-steroidal anti-inflammatory drugs. Physical examination revealed a small moveable mass, tender to palpation just proximal to the plantar medial aspect of the left first metatarsophalangeal joint (MPTJ). Constitutional signs and symptoms of infection were not present (Figs. 1–3).

Initial radiographs revealed no soft tissue calcifications, fractures, or periosteal reactions within the vicinity of the soft tissue mass. Following the infiltration of 5cc of 1% Lidocaine plain proximal to the mass, fine needle aspiration was attempted; but no aspirate obtained. Alternative treatment options including surgical excision were discussed with the patient in detail, and a facility time reserved for the following week. However, due to extenuating circumstances the case was cancelled.

The patient returned to the clinic in April 2018 with increased symptomatology localized to the same area. Physical examination revealed a noticeable increase in the size of the mass and new onset dysesthesias. Magnetic resonance imaging (MRI) on a 1.5 T magnet before and after the administration of 15 ml of Dotarem IV contrast revealed a 8.0 × 6.0 × 5.0 mm, well-circumscribed, benign appearing subcutaneous mass localized to the plantar aspect of the left first metatarsal neck. Due to the continued failure of conservative treatments, excisional biopsy of the soft tissue mass was scheduled.

Excisional biopsy of the mass was performed with the patient in the supine position under IV sedation. An ipsilateral ankle tourniquet was

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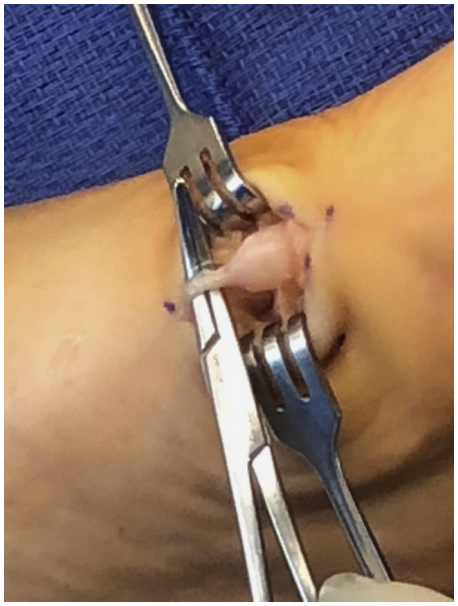

Fig. 1. Schwannoma showing nerve branch continuation proximal.

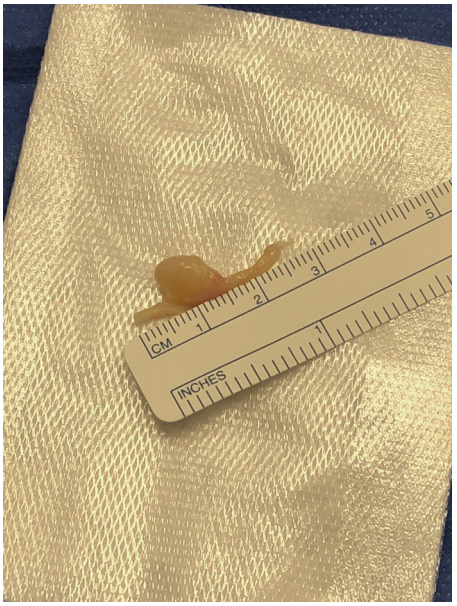

Fig. 3. Pathological schwannoma specimen.

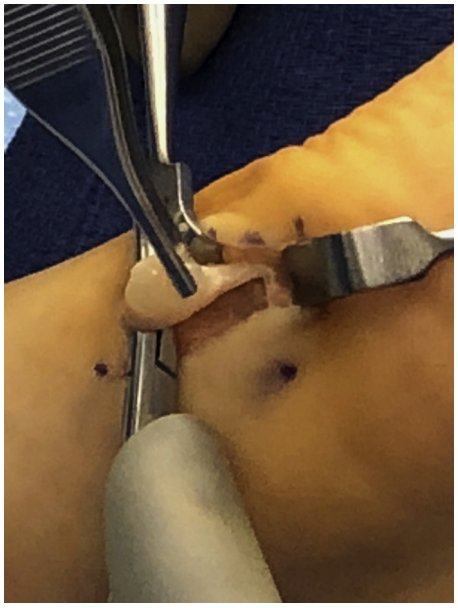

Fig. 2. Schwannoma showing nerve branch continuation, distal.

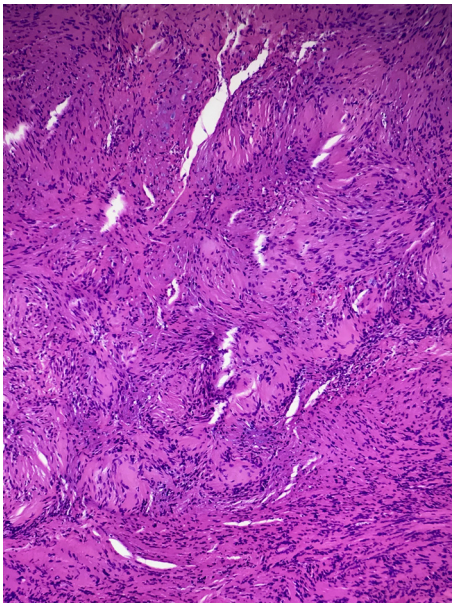

Fig. 4. H&E × 100.

used after exsanguination of the extremity by elevation, and the infiltration of 10cc of 1% Lidocaine plain proximally. A 4 cm linear longitudinal incision over the medial aspect of the left 1st MTPJ was made. An encapsulated, smooth glistening white-grey mass was immediately visualized, and demonstrated no obvious extensions, or associations with any nearby vascular or tendinous structures. Centrally, the mass was bisected by the plantar medial nerve branch of the hallux, which continued proximally and distally [1,2]. The mass involved the entire nerve, and proved difficult to separate surgically. The nerve was resected as proximal and distal as possible to prevent any entrapments, and the specimen sent to pathology and microbiology for assessment [3].

Gross pathological examination revealed a single, edematous shaped fragment of light tan round to elongated shaped fibrous tissue measuring 2.0 × 1.0 × 0.6 cm. On microscopic evaluation the cells were positive for S-100,CD56 and focal factor XIIIA, confirming the diagnosis of a schwannoma [4,5]. Postoperatively, the patient had normal healing and recovery, with no complications. At sub-sequential follow-ups now 2 months after surgery, the patient has continued to report minor paresthesia, but no pain (Figs. 4 and 5).

3. Discussion

The present report describes a case of a schwannoma of the foot, in an atypical location and atypical association with the nerve. Schwannomas are derived from the neuroectorderm sheath and their main purpose is to form myelin sheaths in the peripheral nerves. Schwannomas are also categorized with a neurinoma, neurileomma or a neurofibroma however unlike these masses a schwannoma does not pass through the nerve and remains within the outer sheath. Schwannomas also do not present with underlying systemic disease, as does a neurofibromatosis [8]. Schwannomas are normally benign and less than one percent become malignant and degenerate into a neurofibrosarcoma [7]. Schwannomas can develop anywhere in the body,

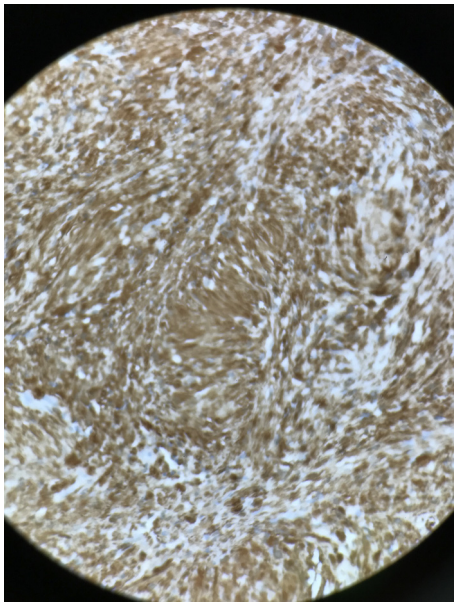

Fig. 5. S-100 × 100.

however most present in major nerves trunks of the upper and lower extremities. In two large cohort studies by Das Gupta et al. and Spiegl et al. most of the schwannomas occurred in the head a neck region with only 11% being located in the foot [5,6]. In the foot most schwannomas present in the deeper dermal tissues or within the compartments and are mostly associated with the peroneal nerve or tibial nerve.

Very few solitary schwannomas have been reported in literature especially where they are localized superficially, located on the plantar surface of the foot and were inseparable from the nerve. In one case review Wolpa et al. reported a 1 cm in diameter schwannoma that was, freely moveable and appeared to be adjacent to the extensor longus tendon to the fifth toe [9]. In another study Fisher et al. reported a schwannoma about 2 cm in height and in width, on the dorsal lateral aspect of the hallux, proximal to the nail [10]. Similar to these cases our patient presented with a superficial palpable mass, increased pain and dyesthesia, however in our case the nerve presented at a common branch of the medial plantar nerve and was located on the medial plantar aspect of the foot. Our case also had the nerve directly entering the base of the schwannoma and was difficult to distinguish between the nerve sheath and the nerve itself.

In conclusion, common branched medial plantar nerve schwannomas are very rare solitary nerve sheath tumors. Only 11 cases of schwanommas in the forefoot foot have been reported in English literature [11]. They should always be considered as a differential diagnosis when ganglion cysts, fibromas, or neuromas are suspected. MRI is especially useful in identifying the exact location and size of the mass. Aspirating the mass can also be helpful to help rule out a differential diagnose. However, it is impossible to actually diagnosis a schwannoma utilizing MRI or joint aspirate alone. Definitive treatment and diagnosis is surgical excision, which usually results in complete resolution of symptoms with minimal recurrence, as was the case for this patient. This case study hopes to raise awareness of schwannomas and their clinical presentation.

Conflicts of interest

No financial disclosures or conflicts of interest.

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