The Journal of Foot & Ankle Surgery 55 (2016) 1063–1066

Contents lists available at ScienceDirect

The Journal of Foot & Ankle Surgery

journal homepage: www.jfas.org

Neural Fibrolipoma of the Ankle: A Case Report and Review of the Literature

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ARTICLE INFO

Level of Clinical Evidence: 4

Keywords:
ankle mass
fibrolipomatous hamartoma
lipomatosis of nerve
nerve tumor

ABSTRACT

Neural fibrolipomas are exceedingly rare benign tumors composed of hypertrophied fibrofatty tissue intermixed with nerve tissues. Our review of the published data identified only 15 cases of this tumor involving the foot and/or ankle region. An otherwise healthy 35-year-old male was referred for evaluation of a painless soft tissue mass present in the anterior left ankle. The mass had been present for approximately 6 to 7 years and had recently increased in size. Physical examination demonstrated a prominent, fluctuant mass present in the left ankle measuring 4 cm in diameter. The mass was not well-defined, was immobile, and did not transilluminate. No gross pedal deformity was present. Radiographic imaging revealed increased soft tissue prominence and density to the anterior ankle without bone involvement. Magnetic resonance imaging demonstrated a mass isointense to fat on all sequences without contrast enhancement, suggestive of a lipoma. Surgical excision was performed; the mass was yellow and lipomatous in nature. The mass was intimately associated with the superficial peroneal nerve, which had to be sacrificed during excision. The pathologic examination of the mass revealed findings consistent with a neural fibrolipoma. The patient healed uneventfully without recurrence. His only complaint was of some residual numbness in the medial foot.

Neural fibrolipoma of the foot and ankle region is rare, and the present case report represents the 16th such reported case in the medical literature. The mass is composed of hypertrophied fibrofatty tissue that infiltrates the neural tissue. The recurrence rate has not been well-defined in published studies owing to the paucity of reported cases. However, it has been suggested that recurrence does not develop (1).

Case Report

An otherwise healthy 35-year-old male presented to the senior author's (M.H.T) foot and ankle clinic complaining of an enlarging soft tissue mass present in the left ankle in July 2013. The mass was not painful but had become bothersome owing to its recent increase in size. The mass had first arisen approximately 6 to 7 years before the initial presentation, and this encounter represented the patient's first formal evaluation. He denied traumatic injury to the afflicted extremity. His distant surgical history was remarkable for repair of an umbilical hernia. He reported regular tobacco use and occasional alcohol consumption. He did not take any medications and did not report any medication allergies.

Physical examination revealed palpable dorsal pedis and posterior tibial pulses. No overt neurosensory deficit was found. A prominent, ill-defined, nonmobile mass was present in the anterior aspect of the ankle that measured approximately 4 cm in diameter. It did not transilluminate. No other masses were present, and the overlying skin structure was not compromised. No evidence of macrodactyly or other gross pedal deformity was found.

Conventional anteroposterior, oblique, and lateral weightbearing radiographs of the left foot were obtained. The lateral projection revealed an increase in the soft tissue volume overlying the anterior ankle and dorsal hindfoot (Fig. 1). No evidence was found of osseous involvement. Magnetic resonance imaging with contrast enhancement was obtained (Fig. 2). A nonenhancing mass measuring 1.2 × 6.7 × 3.1 cm was present in the dorsal hindfoot and ankle region that was isointense to subcutaneous fat. It could not be clearly distinguished from the fat present in the cutaneous layer. Axial imaging showed a coaxial cable structure ensconced within the substance of the mass. Incidentally, an uncontained posteromedial osteochondral lesion of the talus was identified. A presumptive diagnosis of lipoma was suggested by the radiologist.

Financial Disclosure: None reported.
Conflict of Interest: Michael H. Theodoulou is a paid consultant to Arthrex, Naples, FL.
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http://dx.doi.org/10.1053/j.jfas.2015.12.012

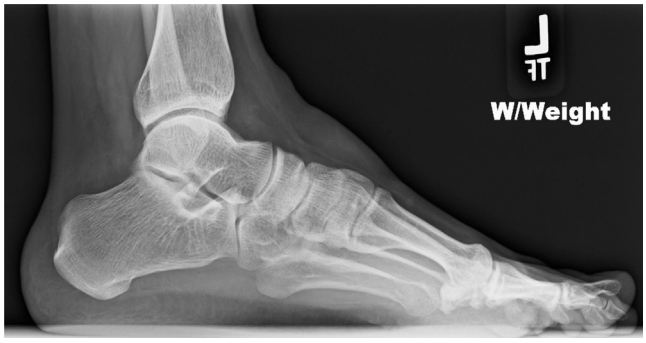

Fig. 1. Standard weightbearing lateral view of the left foot demonstrating an increased soft tissue volume in the anterior ankle/dorsal hindfoot region without underlying osseous involvement.

Given the unusual presentation and recent increase in size, formal excisional biopsy was undertaken in the operating room in October 2013. Arthroscopic evaluation of the ipsilateral ankle joint was performed at the same time (data not included). The patient was placed in the supine position on the operating room table, and general anesthesia was induced. A 7-cm curvilinear incision was made directly overlying the mass (Fig. 3). Careful dissection established a tan-yellow soft tissue mass that communicated intimately with a longitudinally oriented cord-like structure. This was thought to correspond to the superficial peroneal nerve or a branch thereof. The mass could not be dissected free from the nerve, and en bloc resection was performed. The gross specimen measured 8 × 4 × 1 cm (Fig. 4). The specimen was sent to pathology for analysis. A standard layered closure was performed, and the extremity was immobilized in a fiberglass posterior splint.

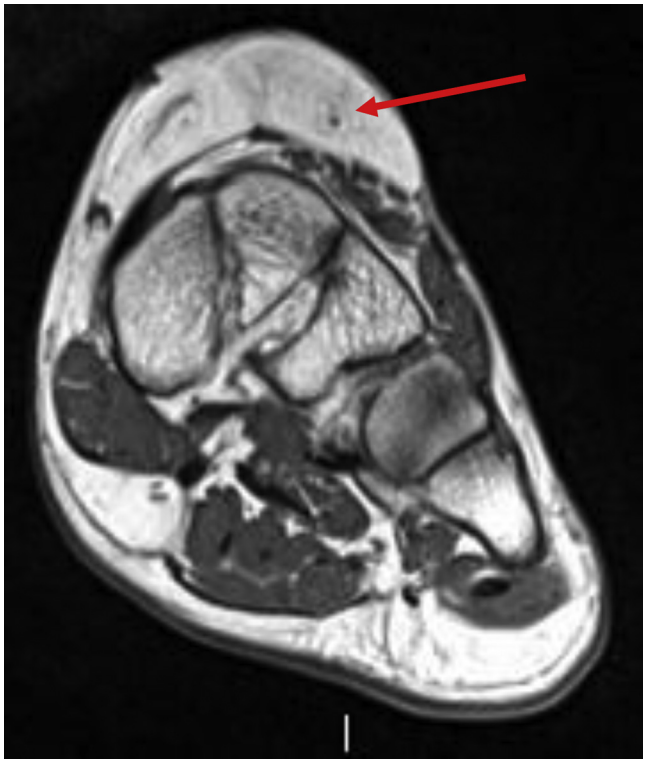

Fig. 2. T_1-weighted axial magnetic resonance image (repetition time 666 ms, excitation time 12 ms) showing the mass in the dorsal midfoot that was isointense to subcutaneous fat. *Arrow* indicates pathognomonic coaxial cable structure, which represents the nerve surrounded by the lesion.

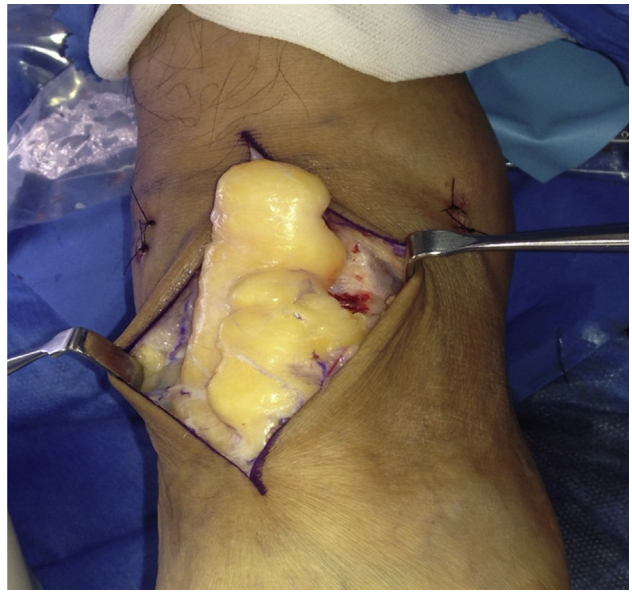

Fig. 3. A curvilinear incision anterior to the ankle/dorsal hindfoot revealed a large tan-yellow mass intimately associated with the superficial peroneal nerve or a branch thereof.

The specimen was sectioned both axially and longitudinally and stained with hematoxylin and eosin (Fig. 5). High-power views revealed lobules of diffuse mature adipocytes infiltrating into the epineurium and perineurium of nerve bundles. The large areas of fatty deposits were separated by fibrous septae. The histologic findings were suggestive of a neural fibrolipoma.

The patient returned for routine postoperative care, and the surgical site healed uneventfully. Not unexpectedly, he demonstrated a residual sensory deficit to the distribution of the medial dorsal cutaneous nerve. An examination performed 1 year after surgery in October 2014 demonstrated that the patient was without evidence of recurrence; however, the sensory deficit along the distribution of the dorsal medial cutaneous nerve persisted.

Discussion

Neural fibrolipomas are rare benign soft tissue masses in the foot and ankle region, and the present case represents the 16th such case. This mass has been described by various other names, including fibrolipomatous hamartoma, lipofibroma, fibrofatty overgrowth, and fatty infiltration of the nerve. When this mass occurs in the setting of macrodactyly, the preferred term is macrodystrophia lipomatosa. Our patient did not present with stigmata suggestive of macrodactyly. With upper extremity and/or median nerve involvement, this soft tissue mass seems to have a greater male sex predilection compared with those in the foot and ankle region (2). Of the 15 case reports identified in the published data, the sex was known for 14 of these cases. With inclusion of the present case report, 75% of the cases occurred in females (Table). The present case does not coincide with previous findings of the sex predilection for lower extremity involvement. The reason for the difference in sex predilection for upper extremity versus lower extremity remains elusive. It is certainly plausible that any observed sex predilection might merely be the result of tumor paucity or the rarity of its being reported. Thus, this finding might be purely by chance alone. No causal relationship has been found between trauma and the development of this soft tissue mass (2). Although the present patient denied antecedent trauma to the affected extremity, magnetic resonance imaging demonstrated a large osteochondral lesion of the medial talar dome, which might