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Case Reports and Series

Intraneural Lipoma of the Tibial Nerve: A Case Report

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ABSTRACT

Intraneural lipomas, neurofibrolipomas, lipofibromatous hamartomas, and perineural lipomas are subsets of hamartomas that typically present as fibroadipose, soft tissue masses within the epineurium of a nerve. Several cases involving intraneural lipomas of the median nerve in the upper extremity have been reported; however, owing to the lesion's rare incidence in the foot and ankle, only a select few cases involving the superficial peroneal nerve have been reported. We present the first case of a tibial nerve intraneural lipoma in a 42-year-old female with a follow-up period of 2 years. We discuss the clinical presentation, distinguishing features, surgical procedures, and short-term outcome regarding this unique tumor.

Intraneural lipomas (INLs) are benign soft tissue masses composed of mature fat cells that present as firm, glistening, pink-yellow tumors most commonly found in the median nerve of the upper extremity (1). Occasionally, this condition is associated with variations of macrodactyly and bony proliferation known as macrodystrophia lipomatosa or proteus syndrome (2–4). Clinically, these soft tissue masses can be painful or painless and have a tendency to arise in areas of the body prone to nerve impingement, such as the wrist, elbow, and ankle. The common symptoms associated with INLs are altered sensation or motor function along the distribution of the affected nerve, a positive Tinel's sign, and pain, likely due to compression of the nerve fibers by a fibrofatty infiltrate in a confined space (5–7). Nerve conduction velocities can also be reduced, and a pathognomonic finding is a serpiginous "cable-like" appearance on magnetic resonance imaging (MRI) (5).

Because of the limited number of foot and ankle INLs discussed in published studies, definitive treatment options and guidelines have yet to be determined for this lesion. Conservative treatment options involve monitoring the size of the lesion and associated sensorymotor deficits. Surgical treatment options include debulking of the mass, resection of the mass, or en bloc resection of the nerve. Also, owing to the benign nature of the lesion, investigators believe recurrence of the mass is unlikely after adequate resection (8). Some investigators have recommended abstaining from surgical excision of asymptomatic masses, unless the INL is a cosmetic concern for the patient (6,7).

Case Report

The patient was a 42-year-old nondiabetic female who presented to our outpatient clinic in February 2014 with a progressively painful and slow-growing soft tissue mass along the medial aspect of her right ankle. The mass was present for an unknown period but had become symptomatic during the course of 1 year. On initial examination, the mass was firm and slightly mobile, with no transillumination. She experienced pain on palpation, with a positive Tinel's sign with percussion of the tibial nerve. No sensory deficits were noted with a Semmes-Weinstein 5.07-g monofilament wire. No abnormalities were detected in the nerve conduction velocity or electromyogram studies. No gross muscular deficits such as atrophy or weakness were noted in the lower extremity. The findings from plain films were also negative; thus, to further assess the mass, a MRI scan was ordered. The T_1-weighted images showed a 3-cm × 2-cm × 10-cm hyperintense, internally striated, bilobed mass adjacent to the tarsal tunnel and extending to the knot of Henry (Figs. 1 and 2). The striations were consistent with the pathognomonic "cable-like" appearance of INLs on MRI; however, owing to the increased signal intensity at the distal aspect of the mass on the T_2-weighted images, liposarcoma could not be ruled out (Figs. 3 and 4).

After discussing the conservative treatment options and because of the rapid growth and painful nature of the lesion, we recommended surgical excision of the mass. The goals of surgery involved identification and excision of the mass and decompression of the tibial nerve. The patient was brought to the operating room and placed on the

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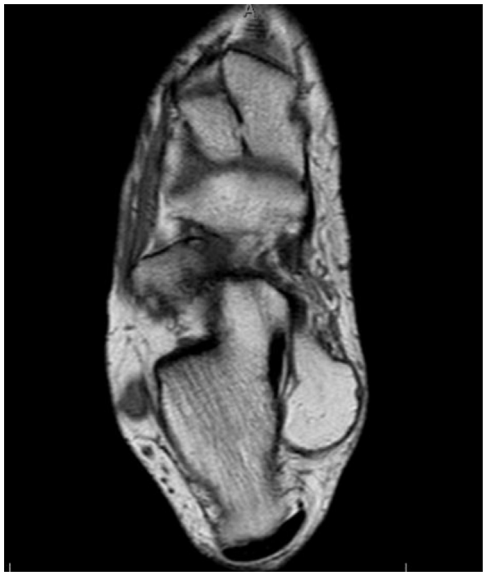

Fig. 1. Magnetic resonance T_1-weighted image, plantar view, showing the hyperintense, internally striated, bilobed mass adjacent to the tarsal tunnel.

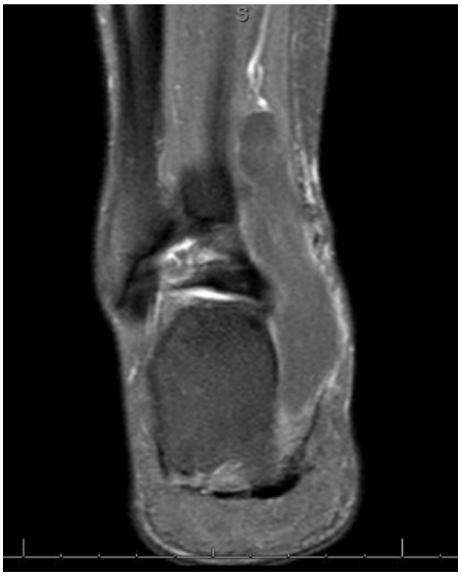

Fig. 3. Pathognomonic "cable-like" appearance of intraneural lipomas on magnetic resonance imaging.

operating room table in a supine position. A thigh tourniquet was applied to the extremity and inflated to 325 mm Hg. Intraoperatively, it was noted that the mass extended to the bifurcation of the tibial nerve; thus, dissection through the flexor retinaculum, porta pedis, and medial and lateral plantar tunnels was necessary to completely expose the INL (Fig. 5). Once exposed, the mass appeared to be encapsulated within the epineurium of the tibial nerve and was not attached to any surrounding vascular structures. Furthermore, a few small, clinically insignificant nerve fibers that were well-adhered to the capsule of the mass were deemed unsalvageable and were resected with the mass using a bipolar coagulator. Owing to the size of the mass and its unknown origin, dissection was performed without the use of loupe magnification. The mass was successfully excised, with preservation of most of the tibial nerve and all nearby vascular structures (Figs. 6 and 7). The specimen was tagged proximally and distally for pathologic evaluation, which revealed mature adipose tissue with interspersed fibrous tissue (Figs. 8 and 9). No nerve fascicles were noted within the mass. A drain was placed in the dead space, the flexor retinaculum was repaired, and closure was completed in layers. The incision site was dressed with saline-soaked Owen's silk and covered with a sterile compressive dressing consisting of 4×4 gauze and a gauze roll.

Postoperatively, the patient's surgical incision dehisced at the proximal and distal aspect but was successfully addressed with local wound care consisting of serial debridement, gradient compression dressings, and application of collagenase or antibiotic ointment (Fig. 10). At the 6-month follow-up point, the patient reported experiencing mild sensory deficits along the course of the proper branch of the medial plantar nerve, but no motor deficits were noted at any time throughout the postoperative course. At the 2-year follow-up period, the patient related minimal pain, minor residual sensory deficits, and no difficulty in performing her daily tasks at work or home.

Discussion

The purpose of this case report was to present a rare INL involving the tibial nerve of the lower extremity. To the best of our

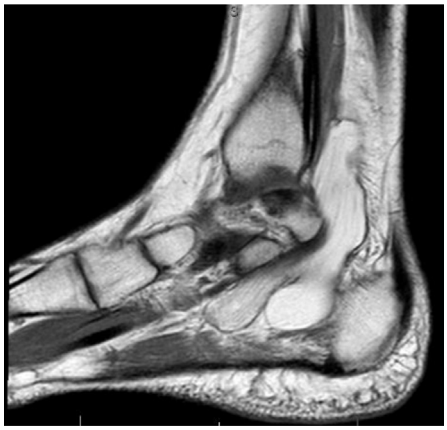

Fig. 2. Magnetic resonance T_1-weighted image, lateral view, showing the hyperintense, internally striated, bilobed mass adjacent to the tarsal tunnel.

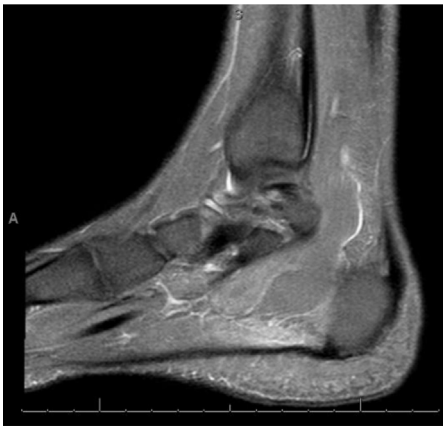

Fig. 4. T_2-weighted magnetic resonance image showing increased signal intensity in the distal mass, possibly indicative of a liposarcoma.