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Case Report

Angioleiomyoma of the ankle with adjacent superficial peroneal nerve neuritis: A case report

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Abstract

Angioleiomyoma is a rare, benign soft tissue neoplasm accounting for approximately 0.2% of all tumors of the foot and ankle. It occurs most frequently in women, with a mean age at presentation of approximately 47 years. Angioleiomyoma arises from smooth muscle proliferation within the tunica media of vessels, possibly originating from arteriovenous anastomoses, and forms a well-circumscribed vascular smooth muscle tumor. Complete surgical excision is considered curative in most cases and is associated with a low reported recurrence rate. Approximately 1% of cases transform into malignant variants, including leiomyosarcoma. Early identification and appropriate management are therefore essential to optimize outcomes and mitigate the potential risk of malignant progression. We present a rare case of angioleiomyoma arising over the superficial peroneal nerve at the ankle, highlighting its clinical presentation, imaging characteristics, surgical management, and histopathologic findings.

Level of Evidence IV, Case Report.

Keywords: Angiomyoma; Skin neoplasms; Mass; Soft tissue neoplasms; Foot.

Introduction

Angioleiomyoma is a rare, benign soft tissue neoplasm accounting for approximately 0.2% of all tumors of the foot and ankle[1]. It occurs most frequently in women, with a mean age at presentation of approximately 47 years[2]. Angioleiomyoma arises from smooth muscle proliferation within the tunica media of vessels, possibly originating from arteriovenous anastomoses, and forms a well-circumscribed vascular smooth muscle tumor.

Clinically, angioleiomyoma most commonly presents as a small, slow-growing, painful subcutaneous nodule in the lower extremity. Because of its nonspecific presentation and overlapping features with other neural or vascular tumors, preoperative diagnosis remains challenging and is rarely established. Definitive diagnosis is typically achieved through histopathologic examination following surgical excision.

Complete surgical excision is considered curative in most cases and is associated with a low reported recurrence rate. Approximately 1% of cases transform into malignant variants, including leiomyosarcoma[3,4]. Early identification and appropriate management are therefore essential to optimize outcomes and mitigate the potential risk of malignant progression. We present a rare case of angioleiomyoma arising over the superficial peroneal nerve at the ankle, which is unusual in this location. We also highlight its clinical presentation, imaging characteristics, and surgical management.

Case report

A 62-year-old woman with a 2-year history of superficial peroneal nerve (SPN) neuritis and an overlying soft tissue mass presented to the podiatry clinic. The patient reported that the mass was not painful, but she had an intermittent localized burning sensation; the mass also fluctuated in size. The patient denied radiating pain from the mass; however, Tinel's test did not elicit distal radiation into the foot. Several years earlier, she had fractured her left ankle, which was successfully treated conservatively. Conservative

Study performed at the NYU Langone Health, New York, USA.

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treatments attempted for the left ankle mass included supportive footwear, ankle stretching, icing, nonsteroidal anti-inflammatory drugs (NSAIDs), compression, and local manual massage. After local manual massage, she developed worsening pain radiating to the dorsum of the foot, with associated burning and numbness (Figure 1). Clinically, the mass appeared to be approximately 5 cm proximal and lateral to the lateral malleolus. Non-contrast magnetic resonance imaging (MRI) of the left ankle showed a nonspecific, solid 5 mm nodule anterior to the lateral fibula with slight T2 hyperintensity and T1 hypointensity. The nodule appeared to be approximately 1 cm lateral to the superficial peroneal nerve. On T2-weighted images, hypointense bands were noted, representing the "reticular sign" (Figure 2). Additional findings included a medial talar dome osteochondral defect (OCD) measuring 7 x 7 mm, mild anterior and posterior tibial tenosynovitis, mild peroneal tendinosis, and scar remodeling of the anterior talofibular ligament (ATFL). At that time, the patient had exhausted conservative treatment and continued to experience worsening pain in the lateral left ankle; therefore, the team decided to proceed with operative treatment of the left ankle soft tissue mass.

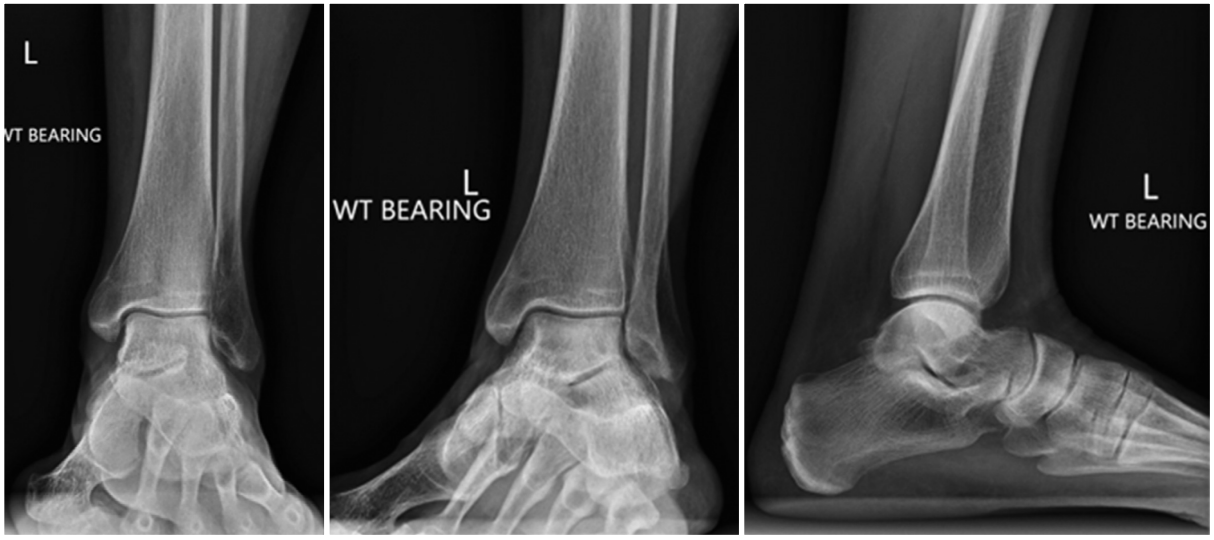

Figure 1. Unremarkable left ankle radiograph.

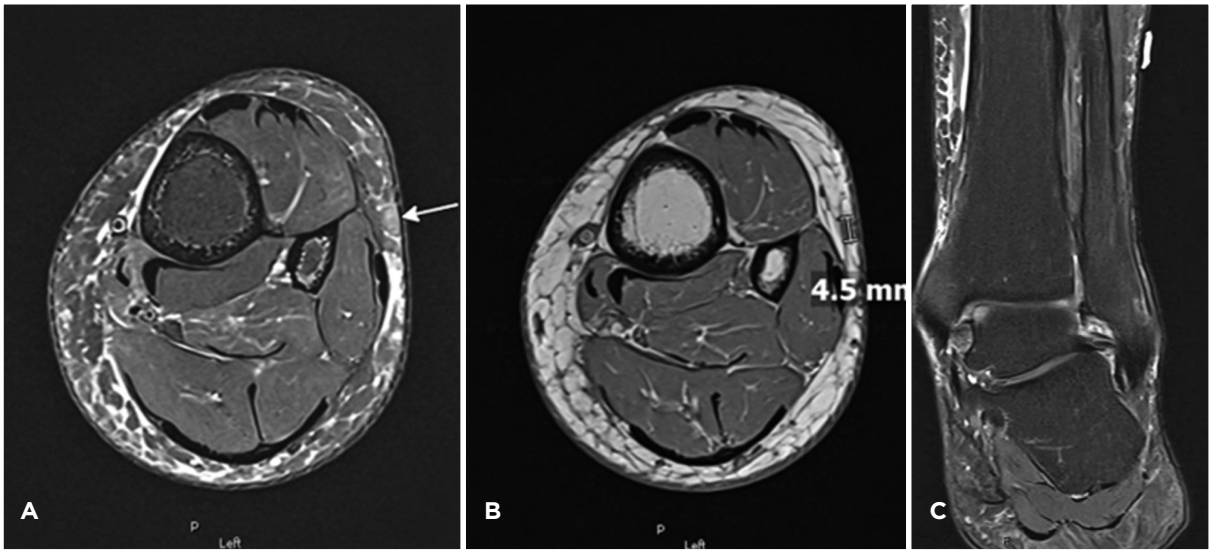

Figure 2. Angioleiomyoma finding. (A) Axial T2-weighted magnetic resonance imaging. (B) Axial T1-weighted magnetic resonance imaging. (C) Coronal T2-weighted fat-saturated magnetic resonance imaging.

The patient was evaluated at two and six weeks postoperatively. At the first postoperative visit, she rated her pain as 0 out of 10 on the visual analog scale (VAS). She reported some tenderness at the surgical site during weight-bearing, which improved with icing, ambulation in a surgical shoe, and use of a knee scooter. The sutures were removed, steri-strips were applied, and the patient was advised to return to normal footwear with a gradual return to activity. At the 6-week follow-up visit, she again rated her pain as 0 out of 10 on the VAS scale and reported complete resolution of the preoperative neuritis. She was advised to return to full activity along with physical therapy and home exercises. She was also encouraged to continue with manual scar tissue manipulation along with nerve flossing techniques to minimize recurrent irritation of the superficial peroneal nerve.

Operative procedure

A 2cm linear longitudinal incision was made directly over the palpable soft tissue mass on the lateral aspect of the left ankle and extended to the subcutaneous tissue. Careful dissection was performed through the subcutaneous tissue, and the superficial peroneal nerve was identified and retracted. A firm soft tissue mass with well-defined boundaries was identified and carefully resected using a Metzenbaum scissors. The mass was completely resected and was notably paler than the surrounding subcutaneous tissue. The mass measured 5 x 5 mm and was sent to pathology for further examination (Figure 3). The surgical site was examined, and no residual soft tissue mass was observed. A postoperative injection consisting of 2 mL of dexamethasone at 4mg/mL was administered locally to the surgical site before application of the postoperative dressing.

Discussion

Angioleiomyoma accounts for 70%-80% of mesenchymal tumors and 4.4%-5% of benign soft tissue tumors[3]. Angioleiomyoma are classified into three subtypes: solid, venous, and cavernous[1]. Solid tumors are defined by smooth muscle cells surrounded by poorly defined capillaries[5]. Venous tumors are characterized by thicker muscular channels[5]. The cavernous subtype, the least common, has dilated vascular channels with small muscular layers[5]. Malignant transformation is rare, accounting for 1% of reported cases[1]. However, treatment is important when patients become symptomatic. In the present case, the mass was 1 mm lateral to the SPN, causing neuritis and adjacent nerve impingement. Pain is one of the symptoms associated with these tumors. Compression of interstitial nerves combined with ischemia appears to cause the pain[6].

In the differential diagnosis, it is important to distinguish angioleiomyoma from other soft tissue tumors. Schwannomas are peripheral nerve tumors that are eccentrically located and may appear clinically similar to angioleiomyoma. Histopathologically, schwannomas show spindle-shaped cells in a palisading pattern[7]. Glomus tumors are mainly located in the subungual region and have arteriovenous anastomoses, an atypical finding for the soft tissue mass in the present case[8]. Hemangiomas are uncommon in the extremities and are mostly found in the head and neck[9]. They are relatively benign lesions with a dark red appearance.

A case series reviewed MRI findings of angioleiomyoma. These benign tumors demonstrate high intensity on T2-weighted imaging; however, they show a dark reticular sign at the peripheral rim[10]. This sign represents interlacing

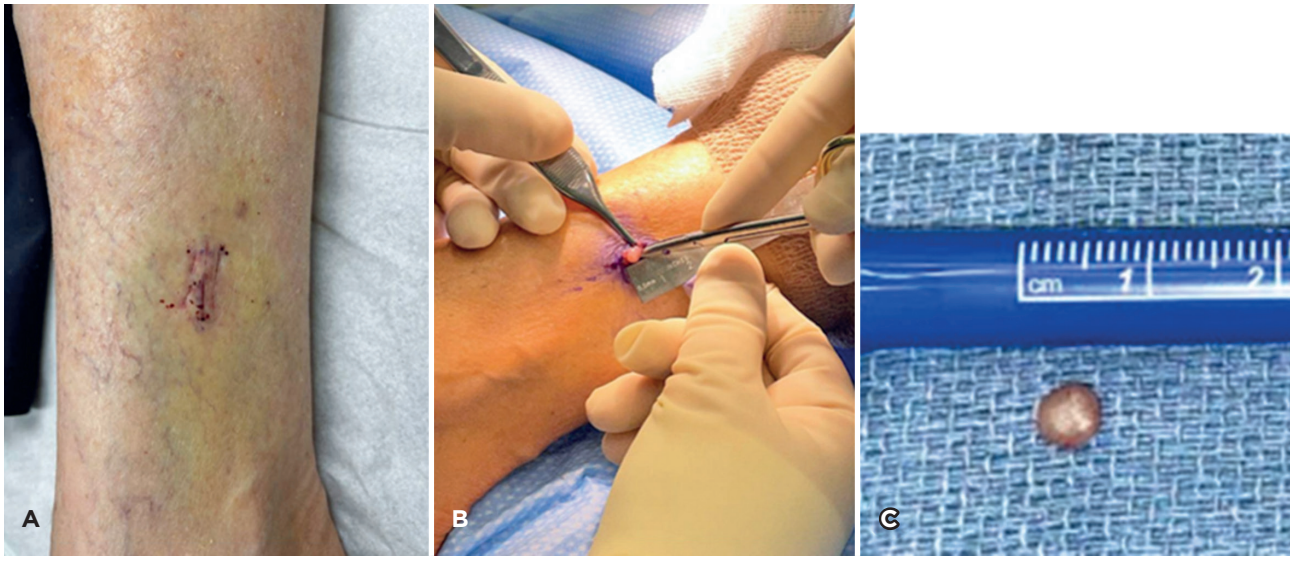

Figure 3. (A) Postoperative incision. (B) Intraoperative finding of mass. (C) Measurement of the mass.

septa and has high interrater reliability for identifying angioleiomyoma. Our patient's MRI showed a slightly hyperintense T2-weighted signal with a peripheral rim when compared with the vitamin E marker. However, establishing a definitive diagnosis of angioleiomyoma based on MRI alone remains challenging.

Surgical excision of such tumors is considered the gold standard[1,5], with a recurrence rate of 2.8% after two years[1]. Malignancy is a concern, with a 5-year survival rate of 20%-35%[1]. However, given the pain associated with these lesions, the time to surgery may be shorter, potentially reducing the likelihood of malignancy.

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