Spindle cell lipoma: a rare case report on the hallux

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Abstract

Spindle cell lipomas are a rare type of lipoma usually presenting in middle-aged to older men, often located on the posterior neck or shoulder; presentation on the foot is exceptionally uncommon. We report a 24-year-old man with spindle cell lipomas on the hallux of his left foot. He experienced an uneventful recovery after excision of the mass. We discuss clinical, radiologic, and histopathologic features of spindle cell lipomas and we review the differential diagnosis at this anatomic site.

Keywords: atypical lipoma, foot, hallux, rare diseases, soft tissue mass, spindle cell

Introduction

Spindle cell lipoma (SCL) is a rare lipomatous neoplasm of subcutaneous tissue that usually presents in older males on the posterior neck, shoulders, or back. Herein, we describe a young man with SCL on the hallux of the left foot to highlight the possibility of presentation in young patients and at atypical sites.

Case Synopsis

A 24-year-old man was referred to the VA podiatry clinic regarding a freely mobile round mass on the medial and plantar aspects of the left hallux since 2014, when he was in the Marine Corps. Despite the mass having remained the same size, it was bothersome to the patient while wearing shoes. He had no history of similar lesions and his past medical history was otherwise notable only for anxiety and depression.

The mass measured 2cm×2cm and appeared as a smooth, skin-colored nodule with no change to the overlying skin texture. In addition, the mass was firm, but compressible. There was no erythema, no increased warmth, no tenderness upon palpation, no crepitus, and no fluctuance. The physical examination findings supported an initial differential diagnosis of a ganglion cyst or a lipoma. The mass seemed fluid filled due to its compressibility, making it suspicious for a ganglion cyst. Conservative management as well as surgical options were discussed with the patient. The patient opted to proceed with excision of the mass. The risks and benefits were discussed, and an MRI was obtained to fully evaluate the mass prior to removal. The patient was instructed to wear wide or open-toed shoes to avoid rubbing on the area.

MRI obtained non-enhancing fat signal intensity nodules within the medial and plantar aspects of the big toe at the level of the interphalangeal joint, consistent with lipoma (**Figure 1**). There were no enhancing components indicating vascularity concerning for malignancy. Histopathology of the excised mass demonstrated a well-circumscribed fibroadipose nodule (**Figure 2A**). Some portions of the nodule consisted of confluent sheets of adipocytes, whereas the adipocytes in other areas were scattered singly and as small clusters within a

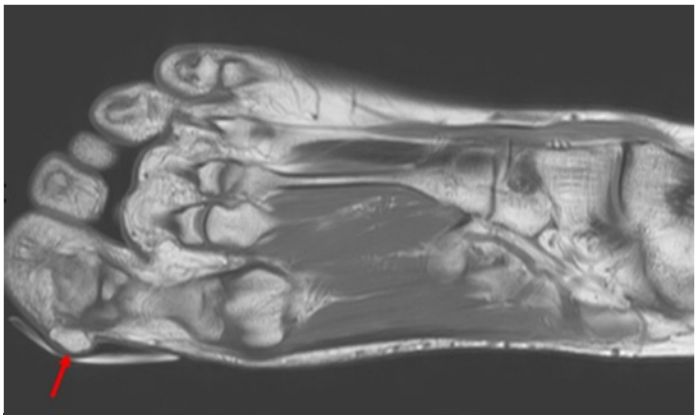

Figure 1. *Axial T1 weighted magnetic resonance imaging demonstrated non-enhancing fat signal intensity nodules within the medial and plantar aspects of the left hallux at the level of the IP joint as indicated by the red arrow.*

background of bland spindle cells and occasional mast cells (**Figure 2B**). No lipoblasts or atypical nuclei were identified. The diagnosis of spindle cell lipoma was rendered.

The patient experienced an uneventful post-operative recovery and has had no recurrence over a 6-month follow-up period. The patient notably stated that his mother recently had spindle cell lipoma in the thigh, indicating the possibility of a familial association.

Case Discussion

Spindle cell lipoma, a type of lipoma, is a slow-growing benign tumor of the subcutaneous tissue that accounts for around 1.5% of adipose tissue neoplasms [1,2]. Men are more commonly affected than women (9:1) and these tumors arise most often during the 4th to 6th decades of life [1]. Approximately 80% of the cases occur on characteristic locations of the shoulders, upper back, and neck. In a previous meta-analysis, 57 out of 439 cases of SCL were in atypical locations [3]. Some of these atypical locations that have been reported include the oral cavity, leg, perineum/inguinal region, forearm, finger, foot, hand, and flank. There have been a few reports regarding SCL in other areas of the foot, including presentation on the dorsum, sole, under the sesamoids, and toes [4-6]. In addition, there has been one previous report of SCL on the hallux of a 28 year-old woman with a history of scleroderma and Ehlers-Danlos syndrome [7]. Herein, we describe a young man with no related history of skin pathologies presenting with SCL on the hallux.

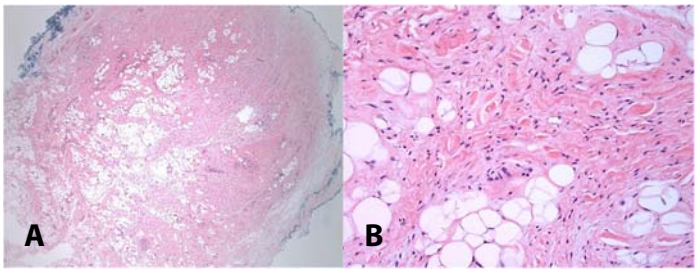

Figure 2. ***A)*** *The excised mass was a well-circumscribed, non-encapsulated nodule. Adipocytes ranged in density from sheet-like to widely scattered. H&E, 20×.* ***B)*** *Intermixed with the adipocytes were bland spindle cells and rare mast cells, interposed between thickened collagen bundles. H&E, 200×.*

In this particular case, the primary differential diagnosis included ganglion cyst and lipoma. Additional entities that could have been added include other benign or malignant lipomatous tumors, neural proliferations, or vascular neoplasms. Clinical findings, radiology, and histopathology can help distinguish SCLs from other soft tissue masses.

Spindle cell lipomas are usually well circumscribed, occasionally encapsulated, painless, firm nodules. The majority are solitary and occur in the subcutaneous tissue; rarely dermal, intramuscular, or multiple tumors have been reported [1]. Macroscopically, SCLs are soft, oval, lobular, and yellow or gray-yellow. SCLs have an average diameter of around 4-5cm, though they can grow as large as 13cm [1,2]. They can grossly resemble simple lipomas, but may be firmer, especially if there is a higher spindle-cell content. Upon transillumination, ganglion cysts allow passage of light while lipomas do not [8].

On radiograph, lipomas have an area of radiolucency called a "water-clear density." On ultrasound, they demonstrate a homogenous and hyperechoic area. On MRI, lipomas have a homogenous, intense signal similar to that of subcutaneous fat [8]. Most SCLs show some level of enhancement ranging from mild to marked intensity. Simple lipomas do not always enhance with contrast. Although radiologic findings can be helpful in determining the extent of the mass, findings may be nonspecific [9]. Most SCLs have a relatively equal ratio of fat and spindle cells; however, variations in the ratio result in imaging

differences that may make it more difficult to differentiate SCL from other lesions. Spindle cell lipomas with less adipose may be misdiagnosed as a liposarcoma, for example [9]. Non-adipose regions of lesions show nonspecific signal characteristics having greater signal intensity than adipose regions. Some SCLs may demonstrate intense enhancement in non-adipose areas due to having prominent plexiform vascularity [9]. To differentiate between liposarcoma and SCL, the enhancement in SCL is more intense than what is seen in liposarcoma.

Since SCLs can demonstrate a range of imaging characteristics that are not always specific, histological analysis is necessary for definitive diagnoses. Spindle cell lipomas are composed of a mixture of mature adipocytes, bland spindle cells arranged in parallel, and rope-like collagen fibers. A myxoid stroma with mast cells is often seen. The proportion of adipocytes, spindle cells, and myxoid stroma can vary greatly between cases [1]. When multinucleated giant cells or floret cells are conspicuous, the term "pleomorphic lipoma" is applied, though whether this represents a separate diagnostic category or merely a variant of SCL remains debated [10]. In general, there is an absence of mitotic activity, lipoblasts, and nuclear pleomorphisms, which are important features when distinguishing SCL from liposarcoma [11]. The distinction, however, may be subtle. For example, SCLs with myxoid content and prominent plexiform vascular pattern can look like myxoid liposarcoma [9]. However, the latter can be differentiated by delicate, branching blood vessels and the presence of lipoblasts.

Immunohistochemically, SCLs normally express CD34 and are negative for S100 [1]. In contrast, both schwannomas and neurofibromas are S100 positive. Furthermore, bcl2 immunostaining is frequently positive in SCLs. Although normally desmin-negative, desmin positivity was found in about 20% of SCLs in one study [12].

Cytogenetic analysis shows that SCLs have loss of material from the long arms of chromosomes 13 and 16, a notable karyotypic alteration [11]. The deletion of the retinoblastoma one (*RB1*) gene at 13q14 is regularly seen, which is confirmed by fluorescence in situ hybridization (FISH) or immunohistology [12].

The exact pathogenesis has yet to be explained. Although mostly occurring in sporadic fashion, familial cases of SCL and individuals with multiple SCLs have been reported, further supporting the consideration that genomic alterations play a role in SCL pathogenesis. In one study, 18 patients were found to have multiple SCLs, with four of those 18 patients being from the same family, and three additional patients having a family history of multiple SCLs. In these families, both sexes and many family members experienced multiple SCLs, suggesting autosomal dominant inheritance. Tumors did not reoccur in the same location, but rather in multiple locations over several years. There does not seem to be a consistent relationship between development of the SCLs and ethnicity, environmental exposure, or other medical illnesses [13].

Although SCLs are typically suspected when a middle-aged man presents with a well-defined mass in the subcutaneous tissue, especially if on the posterior back or neck, it is important to also consider this as in the differential diagnosis for patients who have a well-defined subcutaneous mass regardless of age and location of presentation, especially when there has been a family history of SCL. Treatment with excision of the mass is typically curative with few reoccurrences or complications.

Conclusion

Although uncommon, SCL of the foot should be considered regardless of age when a subcutaneous mass with circumscribed borders is seen. Physical exam, radiography, and histological studies may be used to characterize the mass. Familial history of spindle cell lipoma, when present, further supports a diagnosis. Our case highlights the importance of radiographic and histopathologic correlation when encountering soft tissue lesions of the foot.

Potential conflicts of interest

The authors declare no conflicts of interest.

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