

Lipoma Arising on the Sole of the Foot

T Ueno, S Ansai, Y Matsuoka, T Omi, S Kawana

Citation

T Ueno, S Ansai, Y Matsuoka, T Omi, S Kawana. *Lipoma Arising on the Sole of the Foot*. The Internet Journal of Plastic Surgery. 2012 Volume 8 Number 1.

Abstract

This report describes a case of a common tumor in an uncommon location. Lipoma rarely occurs in the foot, even though it nevertheless represents the most common soft tissue neoplasm. A 42-year-old male presented with a ten-year history of a lipoma on the sole of the foot. Repeated mechanical stress at the site probably led to the development of the lesion.

INTRODUCTION

We present a case of a common tumor in an uncommon location. Lipoma rarely develops in the foot [1], while it represents the most common soft tissue neoplasm [2, 3]. This report describes a case of lipoma arising on the sole of the foot.

CASE REPORT

A 42-year-old Japanese male presented with a ten-year history of an enlarging tumor on the sole of his left foot. He had felt pain during ambulation for the last few years and that had gradually worsened.

A clinical examination revealed a 35 mm × 25 mm dome-shaped lobulated soft tumor located below the head of the first metatarsal on the sole (Fig. 1). It was well-confined, soft, and not adherent to the overlying skin but held to the basement structures. He complained slight tenderness but no radiating pain during the examination.

Clinical appearance. A dome-shaped lobulated soft tumor was located on the sole.

Figure 1

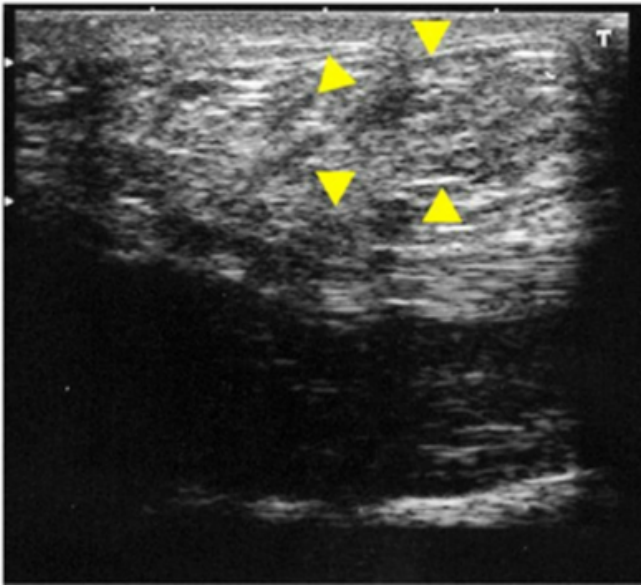
Figure 1



Ultrasonic study of the lesion indicated a circumscribed mass, which was isoechoic in comparison to the fat tissue (Fig. 2). Computed tomography scanning of the foot demonstrated that the lesion was a multi-lobulated fat density tumor with a thin capsule in the subcutaneous tissue of the sole (Fig. 3). The tumor was clinically diagnosed as a lipoma and was completely resected. It was a demarcated yellowish lobulated mass (Fig. 4).

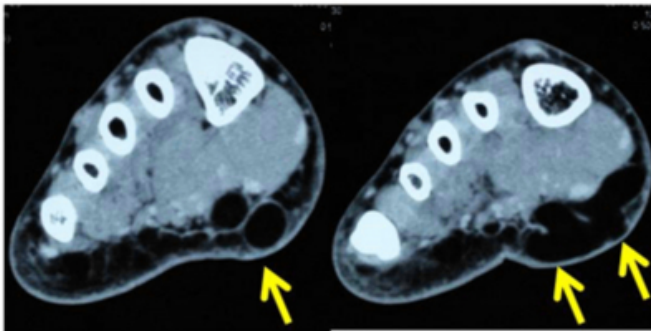
Ultrasonic feature. The lesion (indicated by triangles) was isoechoic to fat tissue.

Figure 2



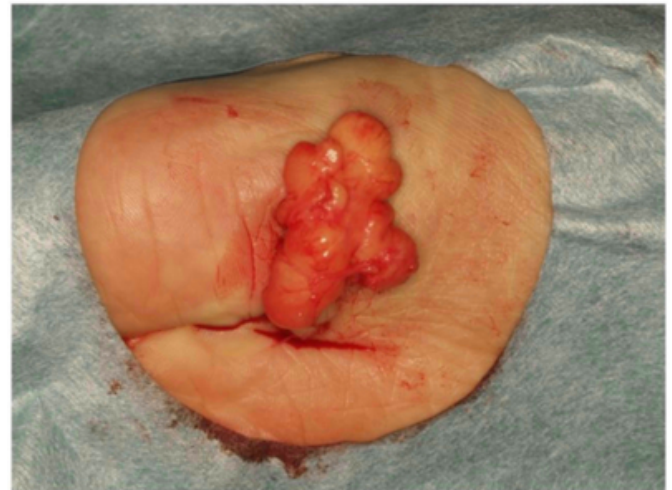
Computed tomography scanning demonstrated that the lesion was a multi-lobulated fat density tumor with a thin capsule in the sole.

Figure 3



The surgically resected specimen was a demarcated yellowish lobulated mass.

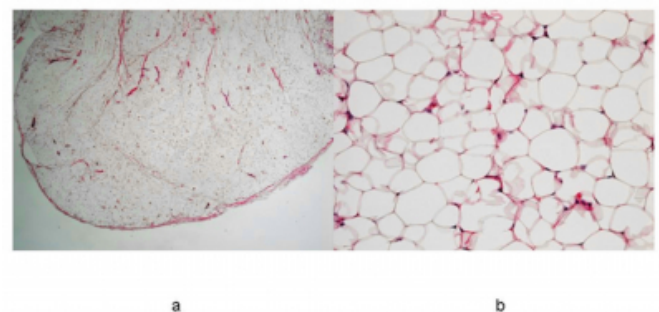
Figure 4



The histological examination revealed that a circumscribed tumor was covered with thin fibrous tissue (Fig. 5a) and that the nest was composed of proliferating mature adipocytes (Fig. 5b). These findings were consistent with a diagnosis of lipoma.

Histological findings with H & E stain. (a) A circumscribed tumor was covered with a thin fibrous tissue. 10 × (b) Tumor nest was composed of proliferating mature adipocytes. 200×

Figure 5



DISCUSSION

The lipomas are the most common soft tissue neoplasm, accounting for almost 50 % of all soft-tissue tumors [2]. They are benign, mesenchymal neoplasms occurring in areas of abundant adipose tissue. These lesions most frequently affect the upper back, neck, abdomen, chest and shoulder, and most commonly occur in the 4th to 7th decades of life [2, 4]. In addition, lipomas occur more frequently in obese patients [5].

Tumors of the foot and ankle are rare, accounting for only 4 % of tumors [6]. This might be due to the relative paucity of soft tissues at the region [7]. The frequency is probably

underestimated, since patients do not routinely examine their whole feet for subtle changes, thus they frequently fail to realize that tumors are also localized in the foot [8]. On the other hand, other investigators have claimed that foot tumors usually are noticed, because the foot has such thin skin and subcutaneous tissue and little muscle that palpation of tumors is relatively easy, and even a small lesion can lead to pain or functional disorders [6, 9].

Tumors of the foot are generally benign and originate from the soft tissue. Ozdemir et al. [6] analyzed their own clinical cases of 196 foot and ankle tumors and reported that the most common tumor was a ganglion followed by plantar fibromatosis, and that they had four cases (2 %) of lipoma in the region.

Kransdorf et al. [10] retrospectively reviewed all cases consulted to the Department of Soft-Tissue Pathology, Armed Forces Institute of Pathology, over a ten year period. They had 18677 benign mesenchymal lesions, 1478 cases (7.9 %) of which occurred in the foot and ankle region. The most frequent foot and ankle tumors were fibromatosis, fibrous histiocytoma and giant cell tumor of tendon sheath. There were 62 cases (4.2 %) of lipoma among them.

Lipoma of the foot should be differentiated from other lipomatous lesions such as fat herniation. A piezogenic pedal papule [11] is a dermatocele induced by pressure. It appears when weight is placed on the heel and disappears as the pressure is relieved. Histological findings of piezogenic papules are fragmentation of the dermal elastic tissue and herniation of subcutaneous fat into the dermis [12]. Post-traumatic lipoma may develop due to a prolapse of adipose tissue following blunt soft tissue trauma. This has also been called pseudolipoma, because there is not a real neoplastic nature of the adipose tissue [5]. Brooke and MacGregor [13] reported a fatty tumor following a blunt trauma and first suggested that this lesion was not a true lipoma but rather a prolapse of normal deep adipose tissue through a tear in the overlying fascia. Typically, pseudolipomas arise on the buttocks or thighs of females 6 to 12 months following blunt trauma [14].

Another theory regarding the role of blunt trauma in the formation of lipomas is that inflammatory cytokines and mediators released by damaged and necrotic cells after trauma can induce of the differentiation of preadipocytes to

mature adipocytes [14]. Aust et al. [5] distinguished these real lipomas from pseudolipomas by the presence of fibrous capsule. Signorini et al. [14] also suggested the ongoing growth of the lesion was unlikely due to fat herniation. The tumor in the present case was able to be identified as a 'real' lipoma because it was surrounded by a thin fibrous capsule and showed a gradual enlargement in size. The pathogenesis of the lesion in the current case may be attributed to the theory of a posttraumatic lipoma, since the tumor was located on the plantar aspect of the head of the first metatarsal, which is continually subject to repeated mechanical stress that could substitute for the blunt trauma.

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Author Information

Takashi Ueno

Department of Dermatology, Musashi-Kosugi Hospital, Nippon Medical School

Shin-ichi Ansai

Department of Dermatology, Musashi-Kosugi Hospital, Nippon Medical School

Yasuko Matsuoka

Department of Dermatology, Musashi-Kosugi Hospital, Nippon Medical School

Tokuya Omi

Department of Dermatology, Queens Square Medical Center

Seiji Kawana

Department of Cutaneous and Mucosal Pathophysiology, Graduate School of Medicine, Nippon Medical School