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Giant Ossifying Lipoma of the Hand: A Case Report and Review of Literature

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Abstract

Lipomas are one of the most common benign tumors of the body, characterized by a slow-growing, painless mass that rarely causes symptoms. Bone metaplasia among the mature adipose cells, however, is a rare condition called osteolipoma. In this article, we present a case report of a 61-year-old lady with a giant osteolipoma of the hand. After a surgical extirpation, she showed a fast recovery, and no recurrence during the two-year follow-up period was observed. We aimed to make a literature review of this pathology, discussing the symptoms, diagnosis, and management of this rare condition.

Categories: Pathology, Oncology, Orthopedics
Keywords: diagnosis, treatment, hand, giant, ossifying lipoma

Introduction

Lipoma is a common benign tumor composed of mature fatty cells that predominantly occurs on the abdomen, shoulder, and upper back. It presents as an asymptomatic, slow-growing round or discoid mass with a soft consistency. Lipomas are benign tumors composed of mature adipose cells [1,2]. In the region of the hand, a giant lipoma is accepted with masses greater than 5 cm [3]. When an osseous or chondrus structure is found among the predominant lipomatous structures,, the tumor is referred to as an osteo or chondrolipoma, respectively. Osteolipoma is a benign tumor consisting of a histological lipoma variant associated with bone metaplasia. It is an extremely rare condition, accounting for less than 1% of all lipomas [4]. The present study aims to present a rare case of giant hand osteolipoma and also make a review of the literature concerning this pathology.

Case Presentation

A 61-year-old female patient is admitted to our department with a painful mass on the dorsal side of her right hand. The patient noted the swelling seven years ago, and it had grown slowly thereafter. She had no history of trauma in that area. Clinically, a solid, mobile, regularly-shaped tumor was observed (Figure *1*).

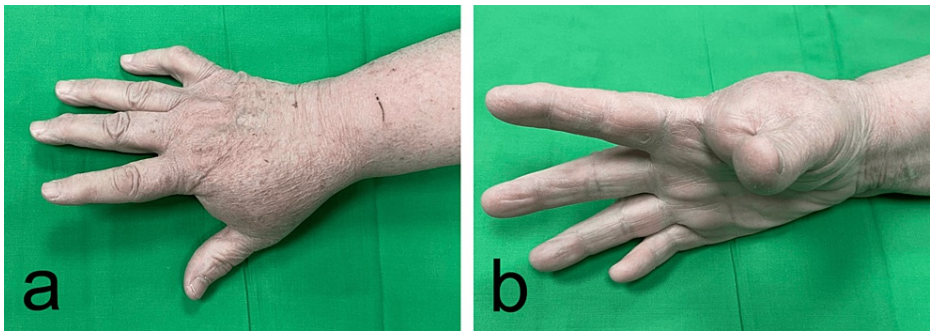

FIGURE 1: (a and b) Preoperative photography presenting a tumor mass localized in the first dorsal web space

It was located between the first and second fingers dorsally on the right hand. The range of motion of the thumb was limited. The patient complained of tingling in the first three fingers of the hand. A plain antero-posterior and lateral roentgenographic were performed (Figure *2a*-*2b*). They revealed a soft-tissue mass with a trabecularly calcified structure in the space between the first and second fingers of the right hand (Figure *2c*-*2d*). A CT with 3D reconstruction was performed for further diagnosis. It showed a soft-tissue mass

measuring 52/30 mm with netlike calcification in its central part (Figure 2e-2f).

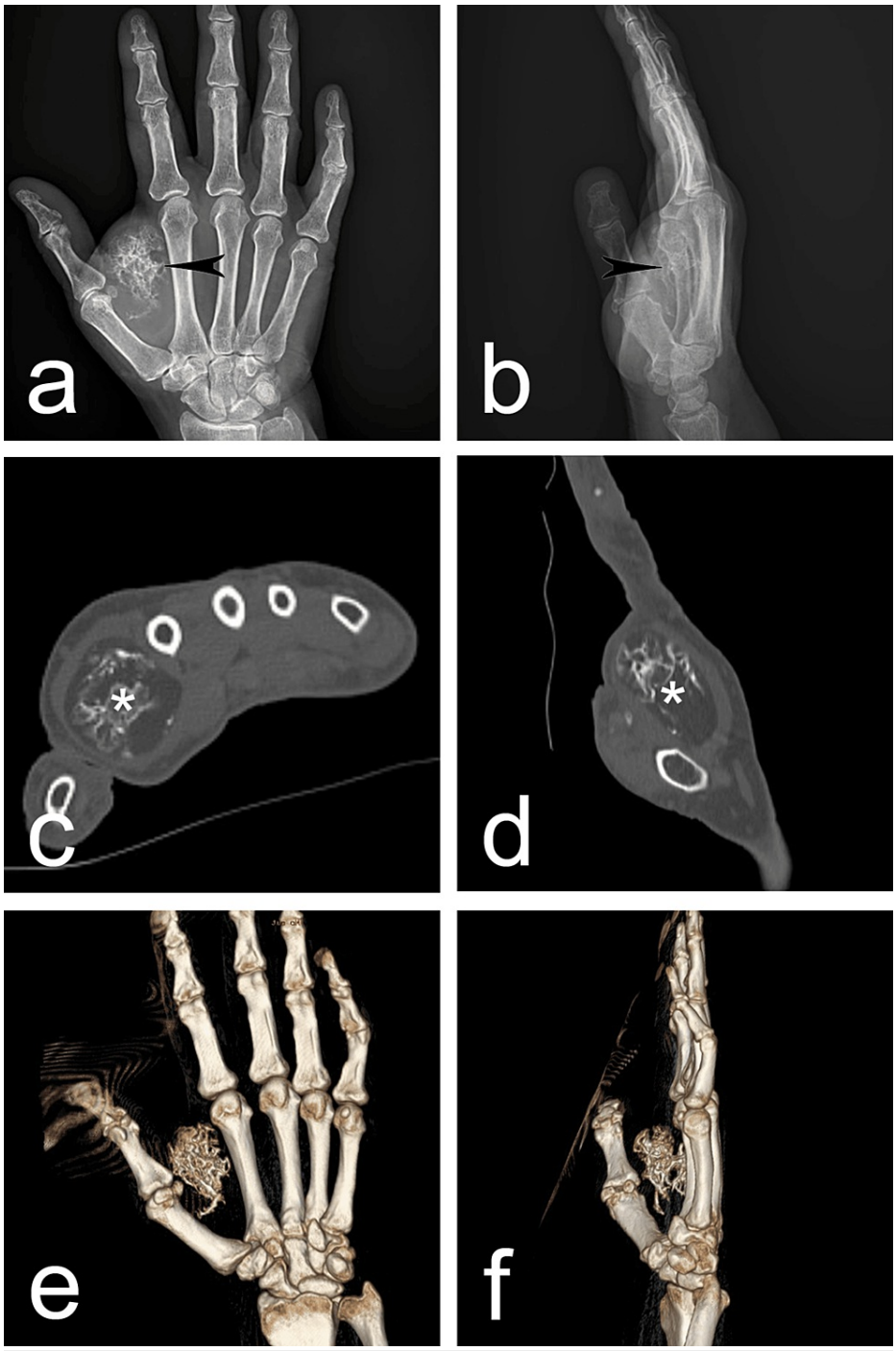

FIGURE 2: (a-b) Roentgenographies presented a clearly defined radiolucent ovoid formation soft-tissue mass with a trabecular calcified structure in it (arrowhead) in the space between the first and second fingers (a - anterior posterior view; b - lateral view). (c-d) CT imaging presented a soft-tissue mass with netlike calcification in its central part (asterisk) (c - transverse view; d - sagittal view). (e-f) 3D reconstruction

CT: computed tomography; 3D: three-dimensional

The surgery was performed through an arcuate incision over the first web space. Below the skin incision, a tumor with the macroscopic characteristics of a lipoma was observed (Figure 3).

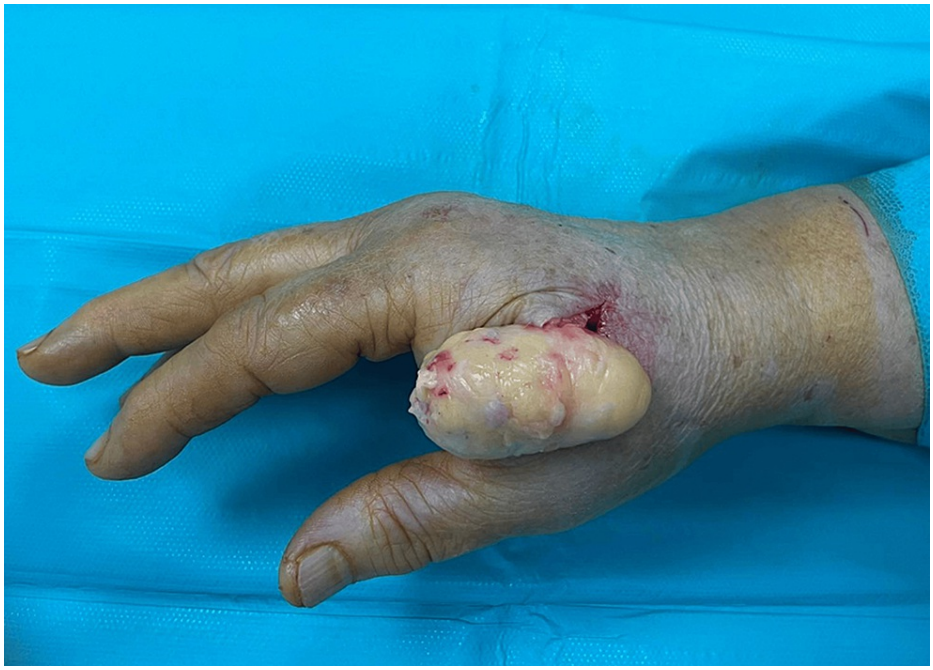

FIGURE 3: Intraoperative photography presenting a well-encapsulated ovoid mass with macroscopic characteristics of lipoma

The mass was carefully dissected to ensure complete excision of the tumor; it covered most of the tendon of the flexor pollicis brevis without infiltrating it. Histological investigation presents a diagnosis of osteolipoma (Figure *4a*-*4c*).

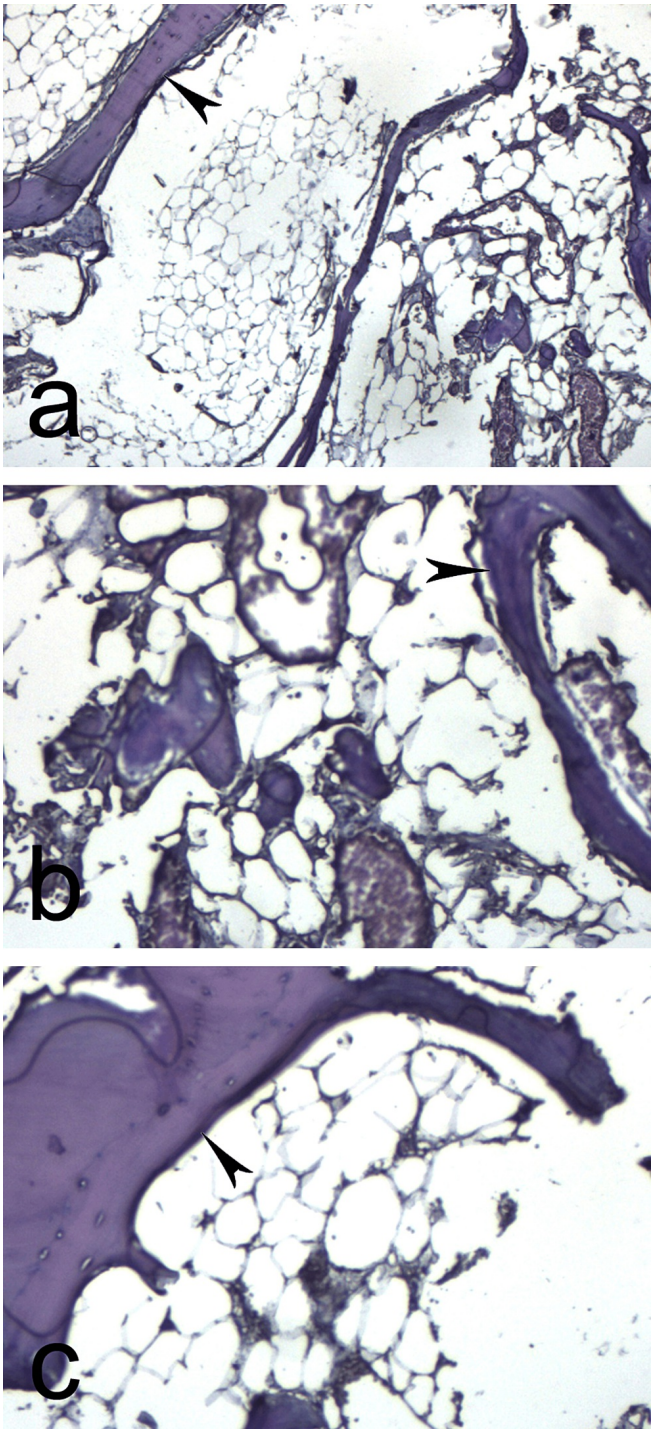

FIGURE 4: Histopathology of the lesion shows mature adipose tissue with trabecula of mature lamellar bone (arrowhead). (a-b) magnification x 100. (c) magnification x 200

Postoperatively, no complications were registered. After two years of follow-up, the patient has a full range of motion of the thumb and no clinical signs of recurrence.

Discussion

Lipomas with bone structures are extremely rare, described for the first time in 1959 by Plaut et al. [5]. Subsequently, there are a few other descriptions of this tumor, including cases with unexpected locations in the tuber cinereum (in patients with schizophrenia) [6], the external auditory canal [7], and the ankle, elbow, and knee joints [8-10]. Osteolipoma of the hand is rare, with only a few cases reported in the literature (Table *1*).

Authors	Age	Symptoms	Duration of symptoms	Size	Diagnostic	Management	Follow-up/recurrence
Tang et al. [11]	8	Congenital osteolipoma	10 months	2.5 cm	X-ray	Surgery	8 years/yes, 19 months, 8 years
Hopkins and Rayan [12]	61	Enlarging mass	6 months	unknown	X-ray, MRI	Surgery	Unknow/no
Teoh et al. [13]	40	Slow-growing mass, painful	3 years	6 x 4 cm	X-ray	Surgery	1 year/no
Chen et al. [14]	54	Enlarging mass	10 years	3.6 x 5 x 3.6 cm	X-ray, MRI	Surgery	1 year/no
van Zwieten and van Unen [15]	41	Slow-growing mass, finger numbness	1 year	2 cm	X-ray, MRI, ultrasound	Surgery	6 months/no
Echavarria et al. [16]	51	Slow-growing mass, pain, finger paresthesia	10 years	6 x 5 x 4 cm	X-ray, MRI	Surgery	6 months/no

TABLE 1: Presenting cases of osteolipoma of the hand

MRI: magnetic resonance imaging

The pathogenesis of lipoma with osseous elements is still unclear, and multiple theories exist, although two proposed mechanisms are widely cited in the literature [11,17]. The first theory suggests that osteolipoma results from the multidirectional differentiation of multipotent mesenchymal cells. Tang et al. [11] described a case of congenital osteolipoma. After a careful pathological examination of this tumor, it was described as a benign mesenchymoma and illustrates the pluripotentiality of the mesenchymal tissue. On the other hand, osteolipoma may arise after repetitive trauma, metabolic changes, or probably ischemia, leading to metaplasia of pre-existing fibrous elements within the lipoma and osteoblasts development [17]. The exact mechanism is still unknown, and more examination of the genetic changes might reveal the exact etiology.

The preoperative diagnosis remains challenging. The most common and first-line method of investigation when a hand tumor is suspected is roentgenography. Typically, osteolipoma would appear as a well-defined mass with signs of trabeculae calcification within it. No cortical abnormality should be observed [4]. CT and MRI are excellent modalities for more precise diagnosis. These methods provide better soft-tissue contrast and can identify fatty, ossified, or calcified components [14]. In our case, we performed a CT scan with 3D reconstruction, showing a soft-tissue mass with net-like calcification.

Histologically, osteolipoma consists of mature adipose tissue with a multifocal area of bony tissue (lamellar bone, woven bone, and cancellous bone) [4]. No cellular atypia or increased mitotic index is usually observed [14], which proves the benign nature of the tumor. No nuclear atypia, cellular pleomorphism, mitosis, or necrosis were ever reported in any of the cases we reviewed.

This pathology can cause different symptoms, from a slow-growing painless mass to finger paresthesia and local pain when compressing peripheral nerves [1-9]. In our case, the patient suffered from swelling and a limited range of motion of the thumb.

In terms of differential diagnosis, osteolipoma can be mistaken for parosteal lipomas. Radiologically, in the last one, there is hyperostosis or pathological changes in the surrounding bones that are not observed in the cases of osteolipoma [18]. On the other hand, it can be distinguished from tumor calcinosis, which has a denser pattern of calcification, and myositis ossificans, in which a typical diffuse ossification is witnessed and is always associated with a history of trauma [12].

The treatment of giant lipomas usually consists of complete surgical removal. Due to the fact that these tumors are well-encapsulated, the excision is relatively easy. Intralesional excision through liposuction could also be performed, but with a higher risk for recurrence and neural or vascular injury [1-3].

Conclusions

The current article aims to present a case report of a giant osteolipoma of the hand. The shown literature review highlights the rarity of this pathology and presents the diagnostic features and treatment. Although it is a benign tumor, osteolipoma can be mistaken for more severe conditions with a bad prognosis. A careful pathohistological and radiological observation must be done.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Georgi P. Georgiev, Atanas Panev, Teodora Paneva

Acquisition, analysis, or interpretation of data: Georgi P. Georgiev, Atanas Panev, Bahram Firoozi, Stefan P. Petrov

Drafting of the manuscript: Georgi P. Georgiev, Atanas Panev, Teodora Paneva

Critical review of the manuscript for important intellectual content: Georgi P. Georgiev, Teodora Paneva, Bahram Firoozi, Stefan P. Petrov

Supervision: Georgi P. Georgiev, Bahram Firoozi, Stefan P. Petrov

Disclosures

Human subjects: Consent was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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