

Compressive lipoma of the digital nerve. A case report

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Case Report

Plastic Surgery



Background: Lipomas are benign tumors of subcutaneous tissue composed of adipose cells and encapsulated by fibrous tissue. They are most common between the ages of 40 and 60, affecting both sexes equally, with a prevalence of 1% and an incidence of 2.1 per 1000 people per year. They are typically located on the head, neck, shoulders, and back, although they can also appear on the hands, where their incidence is 5%, constituting between 3% and 8% of benign tumors in that area. They can cause compression, pain, dysesthesias, and limit finger movement. Rarely, they affect peripheral nerves either through direct compression or by originating within the nerve. Treatment can be medical, with injections to reduce the size of the lipoma, or surgical, with excision being the most effective option to prevent recurrence. The prognosis is good, and once removed, lipomas usually do not recur. Surgical treatment of lipomas in the hand is crucial to alleviate symptoms, prevent complications, improve function and aesthetics, and reduce the risk of long-term recurrence. Although generally benign, lipomas can significantly affect a patient's quality of life, and surgery is the best option for effective treatment. Careful evaluation by a multidisciplinary team is important to determine the most appropriate treatment for each case.

Keywords: Lipoma, resection, excision, neurorrhaphy, hand tumors, digital nerve.

Tumors located in the hand are uncommon. Their presence in the hand is rare, with an incidence of approximately 5%, constituting between 3% and 8% of benign tumors in this area.¹ Both benign and malignant tumors can present with similar clinical pictures but require different approaches for diagnosis and treatment, as the functional and aesthetic outcome for the patient depends on this. A thorough clinical history and adequate physical examination are essential for the initial approach. The location, size, transillumination, and consistency are important parts of an adequate physical examination. Their location varies as they can originate from any structure (muscle, blood vessels, bones, joints, nerves, etc.), so imaging studies such as radiography, computed tomography (CT), and magnetic resonance imaging (MRI) are equally important as complements to the diagnostic approach. The initial imaging approach begins with a radiograph of the affected region to adequately determine the location and whether it is of bone, muscle, or adipose origin.² Based on the results of these studies, an ultrasound may be requested if tendon involvement is suspected; a Doppler ultrasound can determine a vascular or nervous origin. A CT scan provides extra information about the condition of the bone cortices and their extension. MRI can reveal infiltration into soft tissues, with a sensitivity of 93% and specificity of 82% in determining whether a lesion is malignant or benign. Biopsy or pathological examination

establishes the definitive final diagnosis. Despite the low incidence of benign and malignant tumors in the hand, they can be invasive, compromising the functionality and aesthetics of the hand. Treatment for hand tumors should focus on tumor eradication and preservation of function.²

Lipomas are the most common soft tissue tumors but are rare in the hand. As mentioned earlier, their incidence is 5%. Their etiology is unknown, but several genetic factors are associated with their formation. They typically develop between the fourth and seventh decades of life and are very rare in children. They are composed of mature adipocytes. When they have a diameter greater than 5 centimeters, they are considered giant lipomas. They initially grow insidiously, followed by a prolonged state of latency. They can be located in the subcutaneous, subfascial, or intermuscular planes. Superficial lipomas are found in the subcutaneous tissues, while deep ones can be found in the Guyon canal, the carpal tunnel, or beneath the palmar fascia, which are not easily palpable and can cause extrinsic compression of adjacent nerves and functional alterations due to mechanical restriction of joints or tendons.³

Their diagnosis is clinical, presenting as a solitary, asymptomatic mass commonly described as soft, lobulated, circumscribed, mobile, and non-tender. They are diagnosed when they are visible or large enough to compromise and cause mechanical alterations in adjacent structures, leading to

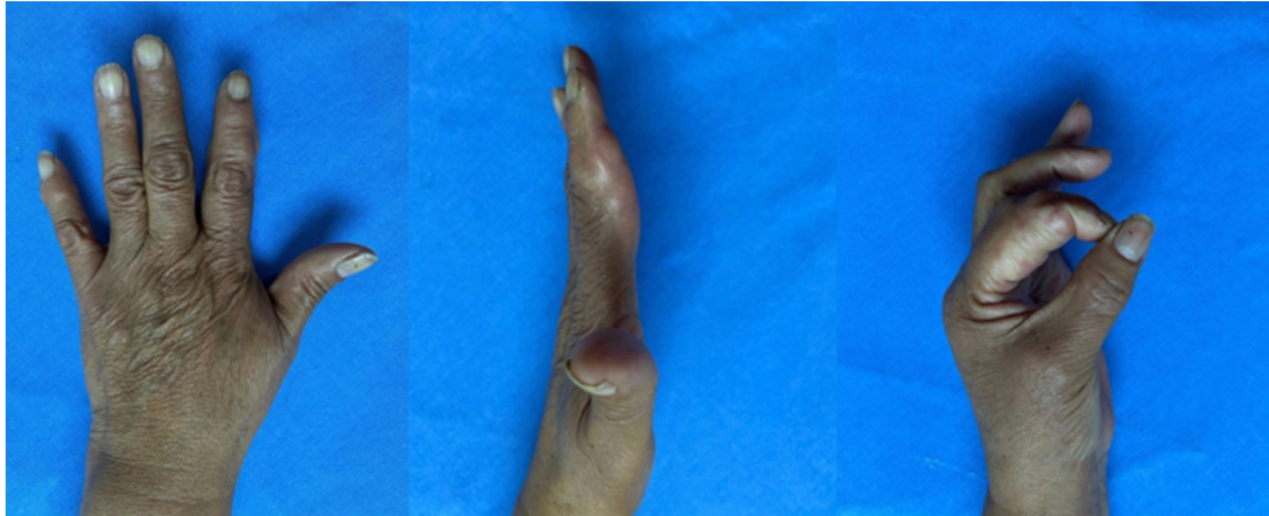


Figure 1. Showing the left hand of the patient with a visible lipoma. The lipoma is observed from both frontal and lateral views, highlighting its size and location on the hand, particularly affecting the second finger.

compression, pain, paresthesias, and limitation of finger movements. During the clinical course, they can cause nerve compression in the affected hand.³

On radiography, they appear as a radiolucent mass. On ultrasound, they are recognized as a homogeneous and circumscribed hyperechoic area. On CT, they show smooth edges with distinct margins, and finally, on MRI, they appear as a homogeneous hyperintense mass, making it the best method to detail location, size, and bone involvement.³

Surgical treatment should be considered when there is pain, functional alterations, compression neuropathy, or significant aesthetic changes in the limb. Usually, the surgical approach in the hand is volar, although if there is a fragmented mass or multiple adhesions, a dorsal or combined approach may be considered. Post-surgical complications include neurovascular injuries and hematomas. The recurrence of lipomas is uncommon.³

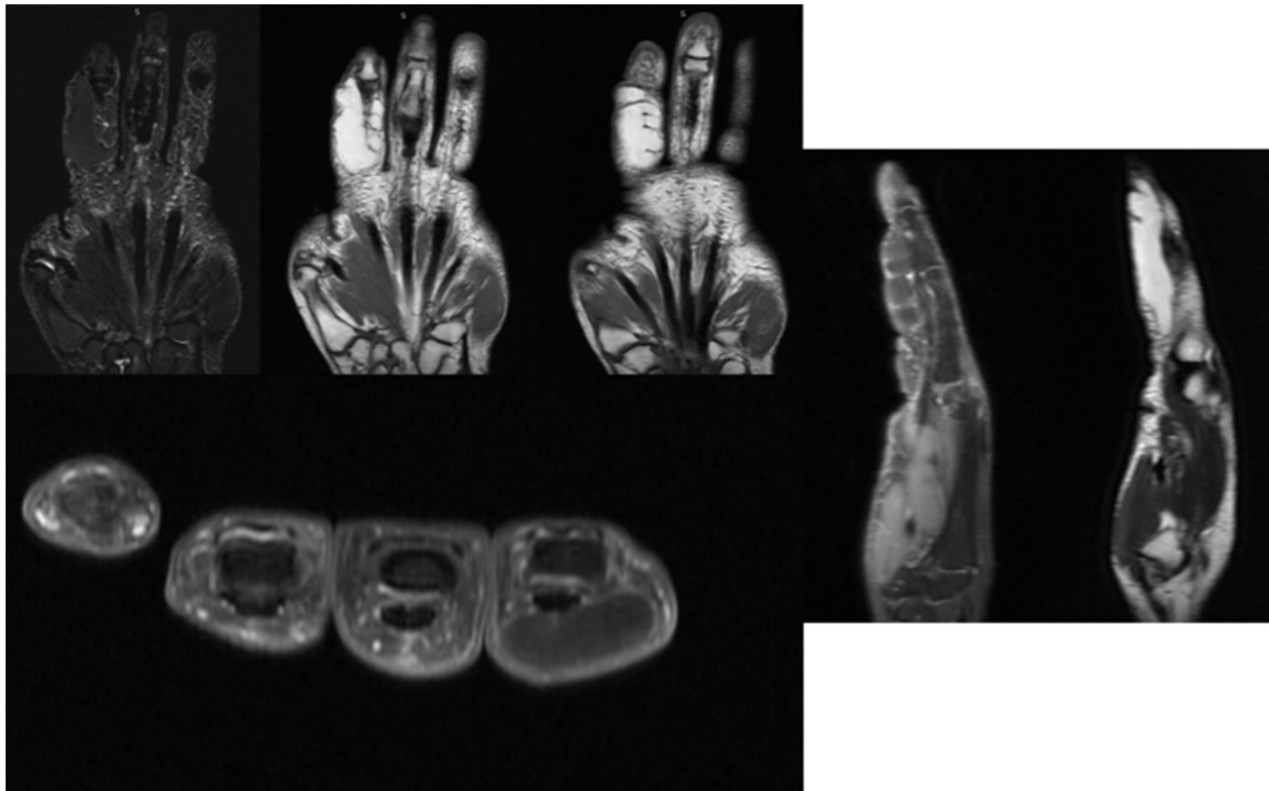


Figure 2. Showing MRI images of the patient's hand with a visible lipoma. The lipoma is observed in coronal, axial, and sagittal views, illustrating its position and extent within the soft tissues of the hand.

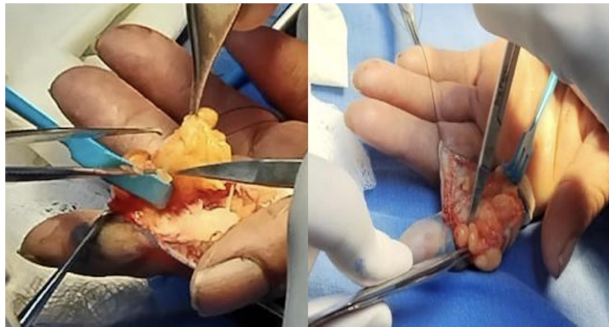


Figure 3. Showing two photos from the trans-surgical extraction of the lipoma. The images illustrate the removal process and the appearance of the lipoma during excision.

Case report

To present the case of a 67-year-old female patient with a tumor located in the second finger of the left hand at the level of the proximal and middle phalanges, involving the inclusion of the digital nerve, for which a tumor excision and subsequent neuroorrhaphy were performed.

A 67-year-old female patient with a 10-year history of progressive volume increase, which has gradually enlarged, located in the second finger of the left hand at the level of the proximal phalanx, accompanied by pain on flexion, paresthesias, and partial limitation of range of motion. On physical examination of the left hand, the second finger presents a soft mass encompassing the proximal and middle phalanges. Capillary refill time is 2 seconds. Sensitivity is present with paresthesias extending to the distal phalanx.

Due to sensory alterations, an MRI of the left hand is requested, reporting a lobulated and well-defined mass in the soft tissues around the interphalangeal joint of the second finger, adjacent to the extensor tendon. This mass is hyperintense on T1-weighted images and saturates on STIR, with approximate dimensions of 44 x 18 x 7.3 mm and a volume of 2.8 cc. It is located between 1 mm and 10 mm deep from the skin. The diagnosis is a ganglion of the tendon sheath of the second finger. The rest of the evaluated structures are within normal parameters.

The patient was scheduled for tumor excision. Surgical marking was performed, and through a volar approach, a Bruner incision was made, locating a yellowish opaque tumor approximately 2x2 centimeters, multilobulated and encapsulated. During dissection and resection, involvement of the radial neuromuscular pedicle was found, with nerve and artery section observed. Hemostasis was performed, and neuroorrhaphy with nylon 8-0 suture was carried out. The integrity of anatomical structures was verified. Subsequently, the incision was closed in layers, and the skin flaps were approximated. The surgery was concluded. The histopathological result

indicated mature adipose tissue without atypia, compatible with lipoma without malignant characteristics.

One month postoperatively, the patient was free of paresthesias, with preserved range of motion and adequate grip strength.

Discussion

The importance of surgical treatment for lipomas lies in several key aspects affecting the patient's health and quality of life: Although lipomas are generally benign, they can cause significant discomfort, especially when they reach a considerable size or interfere with nearby structures such as nerves or blood vessels. Our patient presented with volume increase due to a soft mass involving the proximal and middle phalanges, partially limiting mobility and accompanied by paresthesias in the second finger of the left hand.

Adipose cells are a normal constituent of peripheral nerves, residing between nerve fascicles; however, adipose tissue tumors arising in peripheral nerves are extremely rare. Many terms have been used to refer to lipomatous tumors involving peripheral nerves, such as intraneural lipomas, fibrolipoma, neurallipoma, perineural lipomatosis, and extraneural lipomas compressing nerves. Most nerves involving peripheral nerves have been reported in the median, radial, and ulnar nerves. In our patient's case, the rarity and clinical relevance are accentuated due to the nerve involvement of the tumor, as the patient presented with paresthesias, an uncommon symptom in the presence of lipomas. What makes our case unique and significant is the involvement of the radial neuromuscular pedicle by the lipoma. This type of nerve inclusion is uncommon and presents additional challenges during treatment.⁴

Surgery can prevent serious complications associated with nerve compression, such as neuropathy or loss of function. In cases where lipomas affect finger mobility or hand function, surgical treatment can restore normal function by removing the tumor mass and allowing the recovery of normal function in adjacent tissues. Although recurrences of lipomas after surgical excision are uncommon, surgical treatment offers the best opportunity for complete removal of the tumor mass and its fibrous capsule, reducing the risk of long-term recurrence. Additional treatment involves rehabilitation exercises for better recovery and the resolution of sequelae such as paresis, paresthesias, anesthesia, and partial loss of mobility. In the postoperative follow-up of our patient, favorable evolution was observed with fully preserved range of motion, normal capillary refill, and slight occasional intermittent paresthesias with no predominant timing.⁶

According to the literature, the rarity of nerve involvement in our patient underscores the importance of proper diagnosis and treatment. Surgical resection allowed for the complete removal of the tumor while preserving the integrity of anatomical structures, resulting in a successful recovery with preserved mobility and grip strength in the affected finger and minimal presence of paresthesias. This case illustrates the importance of considering possible nerve involvement in lipomatous tumors, which is crucial for effective clinical management. Surgical treatment of lipomas in the hand not only addresses the present symptoms and prevents potential complications but also improves the function and aesthetics of the hand, resulting in a better quality of life for the patient.⁶

Conclusions

Surgical treatment of lipomas in the hand is essential to alleviate symptoms, prevent complications, improve hand function and aesthetics, and reduce the risk of long-term recurrences. Although lipomas are generally benign, their impact on the patient's quality of life can be significant, and surgery offers the best option to address these tumors effectively and completely. Careful evaluation by a multidisciplinary team is important to determine the most appropriate treatment approach for each individual case.

Conflicts of interests

The authors declare no conflicts of interest.

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