

Case Report: Intramuscular Lipoma of the Hypothenar Space with Neurological Implications

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Abstract: *A lipoma is a common subcutaneous mesenchymal benign tumor, occurring in approximately 2% of the population. However, its occurrence in the distal extremities is very rare. Lipomas in the hand can lead to various issues, including cosmetic concerns, functional impairment, and neurological complications. Surgical removal is required when they are symptomatic. While lipomas can develop in any anatomical plane, intramuscular lipomas of the hand are extremely rare, with only a few cases reported in the literature. This case report describes a rare occurrence of a giant intramuscular lipoma in the hypothenar region of the right hand. The patient presented with neurological symptoms, including tingling and numbness in the third, fourth, and fifth fingers. The condition was managed with surgical excision while preserving the superficial ulnar nerve. Post-surgery, the patient experienced complete resolution of symptoms and improved finger extension strength.*

Keywords: Hypothenar, Subcutaneous swelling, Intramuscular lipoma, palmar lipoma, neuropathy, hypothenar lipoma, ulnar nerve compression.

1. Introduction

A lipoma is a common subcutaneous mesenchymal benign tumour, which occurs in approximately 2% of the general population. Localization in distal extremities is uncommon, occurring in less than 1% of cases. It is classified as giant if it exceeds 5 cm. A giant lipoma in the hand is usually asymptomatic. In 25% of cases, it can cause compression of surrounding tissues.^{1,2} Despite the fact that they are predominantly located in the subcutaneous tissue, intramuscular locations are relatively common. The most common sites of involvement of intramuscular lipomas are the large muscles of the extremities, especially those of the thigh, shoulder, and upper arm, while the hand location is extremely rare³. Lipomas in the hand are a rare occurrence, with thenar eminence subcutaneous region being the most common when it occurs. A subfascial lipoma (deep variety) can also occur in the hand but is generally pushed to the side due to the unyielding nature of aponeurosis.⁴ They are mainly asymptomatic, but neuropathy might develop, due to nerve compression, with subsequent pain and functional disability.¹ The main indications for surgical excision are pain, compromised function, cosmetic reasons, and large size.⁵ Only histopathological examination can confirm a definitive diagnosis of a benign giant lipoma.⁶ In this case report we are going to see a rare occurrence of lipoma over the hypothenar region with compression of the branch of the ulnar nerve

leading to neuropathy. The purpose of this case report is to highlight the clinical presentation, diagnostic methods, and surgical management of a rare intramuscular lipoma in the hypothenar region, emphasizing its neurological implications. This case contributes to the scarce literature on intramuscular lipomas in the hypothenar space and emphasizes the importance of early diagnosis and management to prevent functional impairment.

2. Case Report

A 60-year-old female presented to our surgery outpatient department with complaints of swelling over the right palmar region for the past five months, associated with pain over the swelling, and numbness and tingling sensation in the third, fourth, and fifth fingers for the past four months. The patient reported sustaining trauma to the right hand five months ago, following which the swelling became noticeable. She also had a history of difficulty wearing bangles on her right hand since adolescence. She experienced intermittent pain and numbness in the right hand after heavy work or lifting weights, for which she sought treatment at a local hospital and was managed conservatively. During that period, the patient was unaware of the swelling.

On examination, a swelling measuring 6 × 4 cm was noted over the hypothenar aspect of the right palm. (Image-1A, B).



Image 1: Clinical image of patient's right palm showing mass in the hypothenar eminence
A: Front view; **B:** Lateral view

The overlying skin appeared normal, with no visible pulsation. The swelling was pinchable, firm in consistency, mobile, and exhibited no indentation or fluctuation. Compression of the swelling for one-minute induced pain in the third, fourth, and fifth fingers of the right hand, along with increased numbness and tingling, suggestive of nerve compression. Bilateral axillary regions showed no palpable lymph nodes.

Ultrasound of the affected region revealed a well-defined macrolobulated fat-echoic lesion with its epicenter in the intramuscular plane of the hypothenar region, measuring $50 \times 40 \times 25$ mm, consistent with an intramuscular lipoma. (Image-2).

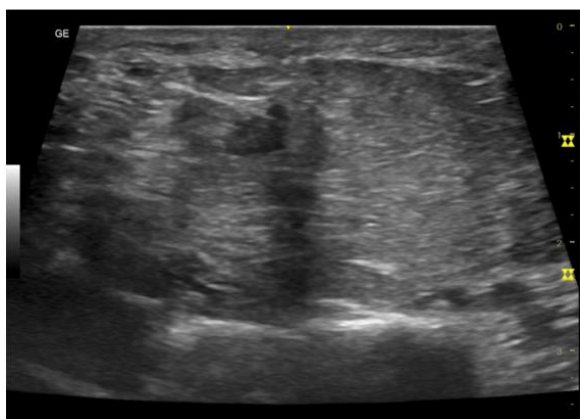
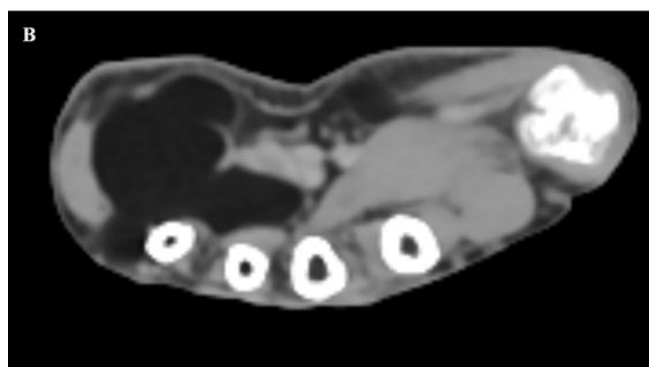


Image 2: USG of right hand- showing a macrolobulated fat echogenicity lesion in the intramuscular plane.

Computed tomography (CT) in the coronal section showed a well-defined macrolobulated fat-density lesion in the intramuscular plane of the hypothenar region, causing a mass effect on the ulnar nerve by effacing the superficial branch laterally and the deep branch posteriorly against the metacarpal bone. This finding aligned with the patient's history of pain and tingling sensation along the ulnar half of the hand. (Image-3A)



Image 3: Computed Tomographic Images; **A:** Coronal section of right hand showing a well-defined macrolobulated fat density lesion in the intramuscular plane of the hypothenar region;



B: Axial section showing extensions of the lesion.

In the axial section, the lesion extended laterally beneath the flexor digitorum tendons and medially abutted and effaced the abductor digiti minimi muscle. Posteriorly, the lesion insinuated between the abductor digiti minimi muscle and the fifth metacarpal bone, extending proximally to the level of the

proximal row of metacarpals. (Image 3B) Fine-needle aspiration cytology (FNAC) of the lesion was suggestive of a benign lipoma.

The patient underwent surgical excision of the lipoma under right axillary block. A linear incision was placed over the swelling, and the incision was deepened to identify the lump between the hypothenar muscles - the abductor and flexor digiti minimi muscles. (Image 4A, B)



Image 4: Intra operative images showing; **A:** Incision with lipoma between hypo thenar muscles. **B:** Specimen en masse

The muscles were retracted, and fine dissection was performed to separate the superficial branch of the ulnar nerve. (Image 4C)



Image 4C: Post excision showing superficial branch of ulnar nerve

The floor of the lump was reached, which was located over the palmar interossei. Distally, the lesion abutted the fifth metacarpal bone, from which it was carefully separated. The lump was excised in toto (Image 4D) and sent for histopathological examination. The skin was closed in a subcuticular manner. (Image 4E).



Image 4D: Excised specimen. **E:** Subcuticular Skin Closure

The patient returned for follow-up after 15 days with no complaints of pain and complete resolution of tingling and numbness. There was also a noted improvement in finger extension strength in the right palm. On local examination wound was healthy. (Image 5)



Image 5: Postoperative wound after 15 days with complete extension of fingers

3. Discussion

The first documented hand lipoma case report dates to 1971 when Phalen et al. published a report of 15 hand and wrist lipomas. They did not find any malignancy in any of the cases but almost 25% had a neurological compromise.⁷ Benign lipomatous lesions may also affect bones, joints and tendon sheaths. The reported frequency of intramuscular lipomas among all benign adipocytic tumors is 1.0%–5.0%, and that of intermuscular lipomas is 0.3%–1.9%.⁸ The frequency of these lesions is the same in all age groups, but in adults deep seated-lipomas are most commonly discovered between the ages of 30 and 60.⁹ The thigh is the commonest location of intramuscular lipomas followed by the deltoid muscle.

Intramuscular lipomas of the hand are very uncommon.^{3,10} There are two subgroups of intramuscular lipomas; infiltrative type and well-circumscribed type. The term infiltrating lipoma has been used due to the infiltrative nature of the tumor in histological examination and represents the commonest type.¹⁰ In the vast majority of the cases intramuscular lipomas are asymptomatic. They generally present as slowly growing painless masses which may sometimes infiltrate deeply and wrap around nerves. They usually appear with large size at diagnosis. A lipoma of greater than 5 cm is classified as a “giant lipoma”. In cases with hand location, they may present with functional deficit or neurovascular compromise due to the mass effect.¹⁰ The case in this study showed a mass effect that caused tingling sensations and numbness over the tip of the ring and little fingers. Hand lipomas can be either superficial or deep. Deep lipomas are categorized as endovaginal, if they are located inside the tendon sheath, or epivaginal, if they are located outside of it.^{11,12} In addition, malignancy must be ruled out for giant lipomas. Liposarcomas are one of the most common soft tissue sarcomas, comprising 7% to 27% of all soft tissue sarcomas. Recent studies report that masses which are fast-growing, >5 cm, or located in the intramuscular area may be a risk factor for liposarcoma.^{13,14} Ultrasonography (US), computed tomography (CT), and magnetic resonance imaging (MRI) are used to diagnose lipomas. Sonography is believed to have a valuable role to play in assessing large swellings of the hand. Ultrasound is a non ionising, quick, cost effective and readily available test which can be used for rapid assessment of a lesion and to provide patient reassurance. On ultrasonography lipomas are well-defined, isoechoic to neighbouring fat, and show no vascularity on colour Doppler. Features including poorly defined margins, on-homogenous echotexture (eg, focal nodularity and necrotic areas), and vascularity on Doppler interrogation should raise suspicion of sarcomatous change in such masses.¹⁵ So, ultrasound is important in characterising the different tumours: the existence of vessels, the existence of a capsule, echogenicity, echo structure and pattern of growth. Together with the clinical findings, ultrasound gives specific information about the nature of the tumour, its localisation and its extent.¹⁶ MRI can also be used to assess these swellings, and has been reported to provide the correct diagnosis in 94% of cases of masses of the hand and wrist.¹⁷ In our case study ultrasound (US) findings were not suspicious of malignancy proceeded with Computed tomography (CT) to know further about extent and relationship. The majority of the cases reported in the literature have demonstrated that surgical excision of lipomas has good results for functional recovery. The intramuscular lipomas of hypothenar are very rare are entirely benign lesions with extremely low frequency of malignant transformation, the treatment of choice is surgical excision. The main reason for excision is the impairment of hand functionality and the cosmetic appearance. The lipoma is usually surrounded by a thin, fibrous capsule, which may allow the mass to be shelled out. Careful dissection is necessary during the surgical procedure in order to avoid recurrence and damage of digital nerves and vessels. The reported recurrence after marginal excision is less than 5% and it occurs more frequently with deep and infiltrating lipomas, because of the modified surgical removal in order to avoid injuring adjacent neurovascular and muscular tissues.¹⁸

4. Conclusion

This case study clearly concludes that an intramuscular lipoma of the palm, presenting with neuropathy due to compression of the digital branch of ulnar nerve, should be managed surgically through excision. Conservative management is not indicated, as delays in surgical intervention can exacerbate neurological symptoms with underlying muscle weakness. A local ultrasound is sufficient to differentiate between benign and malignant lesions; however, preoperative fine-needle aspiration cytology (FNAC) is essential to rule out malignancy and guiding the treatment plan. Although MRI provides detailed information about intramuscular lipomas, it was not performed in this case as she was not affordable because of high cost. This report underscores the importance of early diagnosis and timely surgical intervention in managing rare intramuscular lipomas to prevent neurological complications and functional impairment.

Declarations

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Conflict of interest: None declared

Consent: was obtained from the patient for publication of this case report and accompanying images.

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