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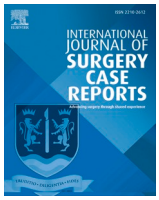

Case report

A giant multi-compartment lipoma of the hand causing median nerve compression: A case report and review of literature

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ABSTRACT

Introduction & importance: Lipomas are slow growing benign soft tissue tumors that arise from mesenchymal preadipocytes. Histologically they are composed of mature adipocytes. They typically have a shawl like distribution in the body, anywhere from the subcutaneous space to bone, but are seen only rarely in the hand. When >5 cm, they are referred to as 'giant lipoma' and can be symptomatic due to neurovascular compression and impaired hand function.

Case presentation: A 51-year-old forensic analyst presented with a progressively enlarging lump over the thenar eminence and palm of his dominant right hand for 2 years duration. Although initially asymptomatic, he developed progressive numbness over the radial 21/2 fingers and impaired hand function due to its size resulting in occupational impairment. Examination revealed a 5x5cm painless lobulated lump over palm. NCS showed evidence of median nerve compression. MR imaging revealed a giant lipoma involving the thenar and midpalmar space. Enbloc surgical excision was performed and histology was confirmatory.

Clinical discussion: Lipomas of the hand could be superficial or deep space. They are slow growing and asymptomatic initially and are brought to attention due to cosmetic concerns, nerve compression or mechanical hand impairment with enlargement. Giant lipomas must be treated with suspicion due to denovo liposarcoma and risk of sarcomatous change.

Conclusion: Giant multi-compartment lipomas of the hand are rare. Surgical excision is advocated for suspicion of malignancy, nerve compression and functional limitation. Enbloc resection without fragmentation has minimal risk of recurrence and complications.

1. Introduction

Lipomas are benign soft tissue tumors that arise from mesenchymal fibrofatty tissue. It is the commonest type of soft tissue tumor in the body accounting for >50 % of cases [1–3].

Although lipomas are histologically identical to normal adipose tissue and comprise of mature adipocytes, they arise from mesenchymal preadipocytes [1]. They form slow growing, usually painless, encapsulated, soft, yellow orange lobulated masses that may compress adjacent structures [1,4]. Variants of lipomas such as fibrolipomas, angiolipomas, myelolipomas, spindle cell lipomas, hibernomas, chondrolipomas and ossifying lipomas occur when they are mixed with other mesenchymal elements [1].

Lipomas can arise anywhere in the body, commonly with a shawl like distribution, in the upper back, neck, shoulders as well as the abdomen. It can be superficial in the subcutaneous space, deep to or within soft tissue or bone [4]. It is seen only rarely in the upper limb especially the hand and represents only 8 % of benign hand tumors [5].

In the hand, lipoma is found in the thenar and hypothenar area rather than the space of Parona and the digits [4,5]. Most are found in the subcutaneous tissue plane but can be seen in deeper layers. These slow growing tumors are usually asymptomatic and primarily a cosmetic concern. It is referred to as a giant lipoma when >5 cm when it can be symptomatic due to neurovascular compression and impaired hand function [1,4–6].

Surgical excision is recommended for rapidly growing and giant lipoma due to the risk of a denovo liposarcoma and low risk of malignant transformation to sarcoma respectively [1,5]. Excision is also recommended in the presence of complications of nerve compression [7].

Here we present a case of multi-compartment giant lipoma of the dominant hand with symptoms of median nerve compression. This case has been reported in line with SCARE guidelines 2020 [8].

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2. Case presentation

A 53-year-old healthy Sri Lankan policeman was referred to the plastics and reconstructive surgery clinic of a tertiary care center from a general surgical clinic with a complaint of a slow growing progressively enlarging lump over the palmar aspect of his dominant right hand for 2 years duration. While asymptomatic initially, as the lump enlarged, he developed numbness and paresthesia over the radial 2 ½ digits, and difficulty in forming a fist, opposition and precision grip. He was a fingerprint analyst by profession and this was interfering with his occupation. He had undergone carpal tunnel decompression of the same side in 2014. His past medical history was otherwise unremarkable.

Physical examination revealed a 5x5cm, soft to firm, nontender, lobulated lump, with poorly-defined edges, in the subcutaneous plain of the right hand involving the thenar and mid-palmar region with extension to the 2nd web space. Sensory examination demonstrated paresthesia over the radial 2 ½ digits. Abductor pollicis brevis power was normal with no weakness in abduction, adduction of the fingers and Froment's test was negative. However, he had limitation in making a fist due to mechanical hindrance from the lump (Fig. 1).

Radiographs of the hand showed no bony abnormalities. Ultrasonography of the hand demonstrated two masses of 13x8mm that extended into deep tissue and was suggestive of a chronic inflammatory pathology. Magnetic resonance imaging of the hand showed a well demarcated, dumbbell shaped lesion in the palmar space measuring 57 mm × 56 mm × 80 mm, passing between the flexor tendons to extend into the mid-palmar space and abut the flexor pollicis brevis. It showed T1, T2 hyperintensity with suppression in fat suppressed images suggestive of a lipoma. Nerve conduction studies demonstrated features compatible with median nerve compression (Fig. 2).

Operative excision was performed by the plastics and reconstructive surgeon under general anesthesia in a bloodless field using a pneumatic tourniquet. A palmar incision was made and deepened to demonstrate a multiloculated lipoma extending from the subcutaneous plain deep into the mid-palmar space and thenar space traversing the flexor tendons with distal extension into the 2nd web space. The lipoma was removed en-bloc preserving the median nerve and its branches, the superficial palmar arch and flexor tendons. The skin was closed with 5.0 non-absorbable polypropylene sutures and a compression dressing was applied. The immediate postoperative period was uncomplicated (Fig. 3).

Histopathological analysis revealed a lipoma composed of mature adipose tissue lobules separated by thin fibrous septa without evidence malignancy.

The patient was referred to the occupational therapy unit for hand exercises and optimization of hand function. At 4 months following surgery, he had no functional or occupational limitations (Fig. 4).

3. Discussion

Lipomas comprise of mature adipocytes and are the most common benign soft tissue mass seen in the body [7–9]. They commonly have a shawl like distribution in the body and are seen rarely in the upper limbs and hand with hand lipomas accounting for 1–3.8 % of all lipomas [9].

Lipomas arise from mesenchymal preadipocytes, and since adipose tissue has a wide distribution within the body, they can be seen in all tissue planes [1,7]. The subcutaneous plane is the commonest, but it is seen deep to the deep fascia, intermuscular, intramuscular and even intraosseous [1]. Similarly, in the hand, superficial lipomas are more common and seen in the subcutaneous fascia. Deep lipomas of the hand are occasional and seen in the Guyon's canal, carpal tunnel or deep palmar space [1,2]. Differential diagnosis for hand lipoma includes ganglion cysts, giant cell tumors, fibrolipomas [9].

They generally initially have a phase of insidious growth followed by a maintenance phase [1]. When small, they are generally asymptomatic, but as they enlarge, they are brought to attention due to cosmetic concerns, nerve compression or entrapment or functional limitation due to mechanical impairment [1,2,10]. Lipomas >5 cm in size are referred to as giant lipomas. These should be treated with suspicion due to the risk of denovo liposarcoma and sarcomatous change [1,4–6].

Deep lipomas of the hand are generally asymptomatic swellings that grow to a considerable size before becoming apparent. These tumors

Fig. 1. Physical appearance of the hand.

Fig. 2. MRI demonstrating a giant lipoma in the palmar and mid-palmar space of the right hand.

may spread along any space that allows expansion. The overlying thick palmar aponeurosis may obscure its true size [2]. The soft tissue structures of the hand are packed tightly and intricately into compartments and have a low compliance. Therefore, any space occupying lesion can cause symptoms secondary to nerve compression or entrapment phenomena with carpal tunnel syndrome being the most commonly described [10].

Ultrasonography is useful in diagnosis in most cases but MRI not only has a diagnostic accuracy of 94 % but helps to better delineate the lesion in relation to surrounding structures [2].

This patient had slow growing multicompartment lipoma extending from the subcutaneous space to the deep space involving the thenar, mid-palmar and web space. Symptoms due to median nerve compression were a late feature due to the enlarged deep component, while the superficial component was responsible for the poor aesthetics. The initial ultrasonographic assessment mistakenly identified it as two separate lumps of chronic inflammatory pathology. Due to the clinical suspicion of lipoma, and the 'giant' nature of the lump, an MRI of the hand was requested to confirm clinical suspicion and anatomical delineation.

Differentiating a de-novo liposarcoma from a lipoma is of paramount importance. Size>5 cm, deep location, rapid growth and pain are 4 red flag signs that should raise suspicion of a possible liposarcoma. When all 4 features are present, there is a 86 % likelihood of the mass being malignant and MRI is mandatory in such cases to look for evidence of local infiltration [9]. Malignant transformation of a lipoma is rare although it has been reported. This patient had 2 of the 4 red flag signs and therefore suspicion of malignancy was not considered. Nonetheless, an MRI was performed prior to planning surgical intervention. Surgical excision was performed due to the symptoms of median nerve compression and mechanical functional impairment. Lipomas are surrounded by a thin capsule and hence careful dissection of neurovascular structures and enbloc resection of the tumor without fragmentation is advocated and was performed and this has shown to have excellent curative results with minimal disease recurrence and iatrogenic complications [1,5,10].

Palmar lipomas can be approached through a volar incision but multi-compartment lipomas especially those extending to the dorsal aspect may require a second incision over the dorsum of the hand. In this case, an extended palmar incision was adequate to enucleate the tumor completely.

4. Conclusion

Giant multi-compartment lipomas of the hand are rare. Surgical excision is advocated for suspicion of malignancy, nerve compression and functional limitation. Enbloc resection without fragmentation has minimal risk of recurrence and complications.

Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

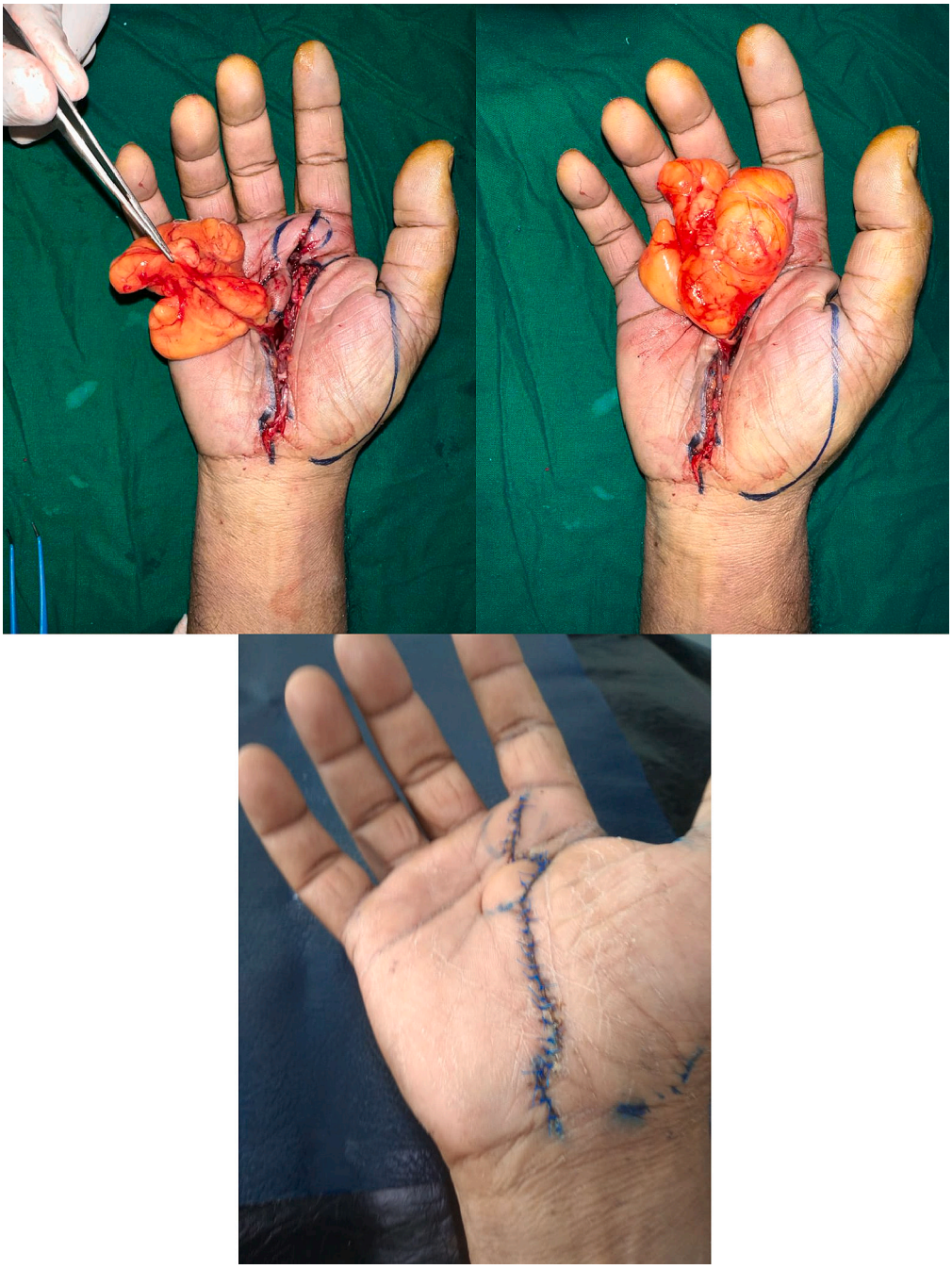

Fig. 3. Intraoperative image demonstrating giant multicompartment lipoma and post-operative image after closure.

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Author contribution

1. Deshan Gomez: Conceptualization, Writing – original draft, Writing – review and editing, Visualization
2. Dishan Samarathunga: Writing – review and editing
3. Dammika Dissanayake: Supervision
4. Gayan Ekanayake: Supervision

Guarantor

Deshan Gomez

Research registration number

N/A

Informed consent

Written informed consent was obtained from the patient for their anonymized information to be published in this article.

Fig. 4. Hand 4 months after surgery depicting good cosmetic outcome.

Patient perspective

The patient is happy that his hand function is back to premorbid levels and has no occupational limitation.

Conflict of interest statement

The author(s) declare(s) that there is no conflict of interest.

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