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Giant Palmar Lipoma: An Unusual Lipomatous Location with Complex Presentation.

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Abstract

Lipomas, also known as "innocent tumours" due to their slow-growing, painless non-infiltrative nature. They usually grow to sizes ≤ 2cm in the hand and upper limb in general. Thus, lipoma that exceeds 5cm in size in the hand is referred to as a "giant lipoma". This case report is that of a multi-compartmental, well-encapsulated giant lipoma of the left hand of a 67-year-old right-handed woman. It occupied the thenar and mid-palmar compartments of the left hand stretching the digital nerves of the thumb, index and middle fingers causing paraesthesia and difficulty with using the affected hand. The mass was excised entirely through a volar longitudinal proximal palmar skin crease approach. The patient had early physiotherapy and has achieved resolution of all symptoms and achieved satisfactory hand function three months postoperative period.

Keywords: *Giant lipoma, lipoma of the hand, marginal excision biopsy*

Introduction

Lipomas are common tumours of mesenchymal origin containing mature adipocytes and represent the single most common soft tissue tumour of the body.[1] Theoretically, lipomas are ubiquitous and can involve any tissue and/or organ of the human body.[2,3] However, despite the moderate amount of fat in the hand, lipoma infrequently involve the hand representing about 3.8%-4.9% of hand tumours.[3,4] Lipoma of the hand can be located in the subcutaneous, subaponeurotic or intramuscular locations.[4] However, the subaponeurotic lipoma is the most common type involving the hand.[4] This case report is interesting due to the rare giant multicompartmental involvement and multiple symptoms presented by a usually asymptomatic benign condition of the human hand.

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Case Report

A 67-year-old right-handed female trader presented with a year history of progressively enlarged swelling of the left hand. The swelling was initially painless but became painful with associated tingling sensation over the radial three-and half digits and difficulty to use the left hand within the last three months prior to presentation. No family history of similar swelling or trauma to the affected left hand. On clinical examination, there was an irregularly shaped mass on the thenar eminence with some mid-palmar extension measuring about 6cm X 4cm and has normal overlying skin (figure 1).

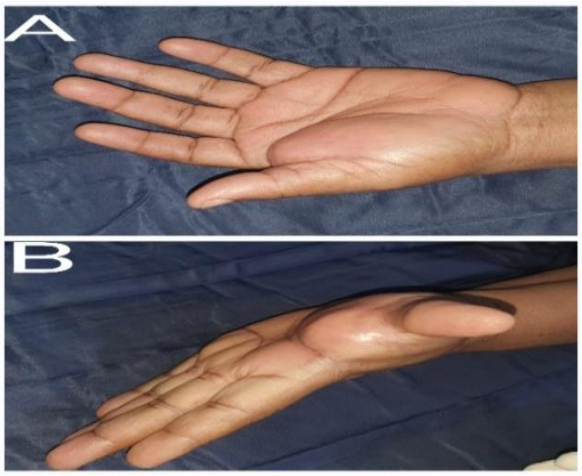

Figure 1: Preoperative appearance of the giant lipoma of the left hand. A: anteroposterior view. B: Oblique view.

It was soft, bosselated, non-tender and freely mobile. There was tenderness and hypersensitivity over the radial three and half digits of the left hand. Plain radiograph of the left hand showed a soft tissue shadow in the thenar region with extension across the mid-palmar region, the bony outlines were normal. The patient had excision biopsy of the mass performed under WALANT (wide awake local anaesthesia no tourniquet).

Operative Technique

The surgery was performed under WALANT. A vertical palmar skin crease incision was made using No. 15 scalpel blade knife, this was developed through the subcutaneous layer by sharp and blunt dissection to expose the mid-palmar fascial and thenar muscles. The skin flaps were retracted and anchored in place using Nylon 0 stay sutures, adductor pollicis muscle separated from flexor pollicis brevis. The intraoperative finding was that of a well-encapsulated, subfascial, multi-lobulated, yellowish fatty mass located in the thenar and mid-palmar regions of the left hand (figure 2).

It measured 6cm in length and weighed 20g and associated with stretching and elongation of the digital nerves to the radial three digits. Proximally it extended into the distal aspect of the left carpal tunnel and hence it was also released. The mass was meticulously separated from the overlying palmar fascia and contiguous tendon sheaths. The obviously stretched neurovascular structures were identified and preserved. The mass was removed en masse and sent for histopathological analysis. Haemostasis was achieved by ligating bleeding vessels, wound closed using Prolene 3/0 suture in a simple interrupted fashion and firm wound dressing applied (figure 3).

Figure 2: Intraoperative appearance of the giant lipoma of the left hand. A: separation of the adductor pollicis and flexor pollicis brevis muscle to expose the giant lipoma. B: Complete marginal excision of the fatty mass.

Figure 3: Immediate postoperative appearance of the left hand showing the excised lipomatous tissue and wound

Postoperative Period

The patient was placed on analgesics, anti-inflammatory drugs and discharged home on a broad-arm sling for ambulatory elevation of the left hand. She was commenced on passive and active physiotherapy on postoperative day 14, and has since achieved satisfactory improvement of the left hand characterised by resolution of all presenting symptoms. Histopathological analysis showed encapsulating segments of proliferating mature

adipocytes separated into lobules by thin fibrous connecting tissue (figure 4).

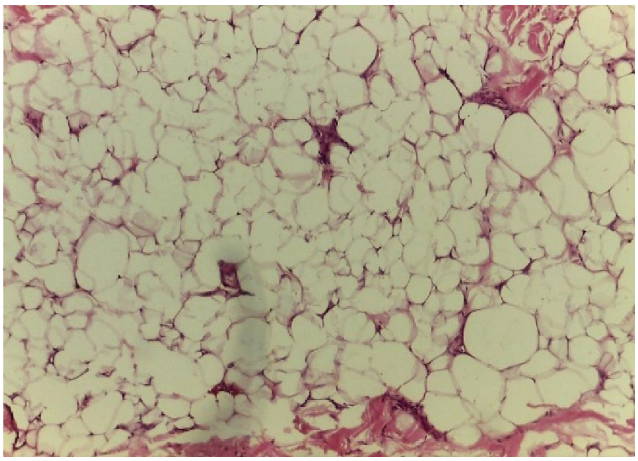

Figure 4: Mature fat cells separated into lobules by thin fibrous connecting tissue.

Discussion

Lipomas are the commonest type of benign soft tissue tumours of the human body accounting for 16% of mesenchymal tumours.[5,6] They are known for their ubiquity, occurring in the upper body and accounts for 15%-20% of tumours of the head and neck region.[6] Lipoma of the hand is rare with a reported prevalence of 3.8%-4.7% of tumours involving the hand.[3,4,6] These tumours can occur in any age group but are usually diagnosed between the fifth, sixth and seventh decades of life (age 50-70 years) which is consistent with the age of our patient: 65 years.[4,6,7] They are rare in children. Neural fibrolipomas, a variant of lipoma which typically presents during early childhood and young adulthood and thus, is the commonest type of lipoma found in children.[6] Obese individuals are more likely to develop lipomas.[7,8]

A "giant lipoma" is defined as a lipoma that is more than 10cm in length or weighs more than 1kg.[6] However, a "giant lipoma of the hand" is that which is more than 5cm in length, or weighs more than 50g.[3-5] Most lipomas of the hand will qualify to be classified as a "giant lipoma" on the basis of the length criterion and rarely on the weight criterion due to the restricted osteofascial space.

The aetiology of lipoma is not well understood. But there have been several theories postulated for it and this includes the genetic, metabolic and traumatic aetiopathogenetic theories.[2,6] Approximately 5% of patients with lipomas have family history of lipoma and it has been known to be inherited with an autosomal dominant pattern.[6,7] Some families demonstrate an autosomal dominant mode of inheritance consistent with familial multiple lipomatosis. A simple dominant pattern has also been seen in Dercum's disease (adiposis dolorosa), which is typically observed in obese, postmenopausal women in whom numerous painful lipomas occur primarily around the hips and thighs.[9] Furthermore to support the genetic basis of lipomas, multiple lipomatous lesions are also components of several rare congenital syndromes such as Cowdens, Bannayan-Zonana and Proteus syndromes.[9] Lipomas are associated with translocation and rearrangement of the 12q13-15 and 6p13q chromosomal region.[6]

The metabolic theory has been explained by the fact that lipomas are more common among individuals with obesity and in women. This is due to the presence of more fat in women and individuals with obesity.[6,9] Although, lipomatous tumours increase in size with weight gain, their sizes do not decrease during the period of weight loss.[6] The link between trauma and the development of lipoma is explained that the process of inflammation following a trauma induces lipoma formation through the release of several growth factors, cytokines and inflammatory mediators which promotes preadipocytes differentiation into mature adipocytes (lipogenesis) to form a clinical apparent mass.[6,9] It has also been suggested that traumatic fat necrosis and extravasation of blood into traumatised soft tissue cause preadipocytes to differentiate and form lipoma.[6,9] Also, microhaemorrhage and focal release of cytokines secondary to bleeding diathesis may trigger lipomatous growth.[9] Furthermore, a spontaneous increase in partial thromboplastin time has been observed in patients with post-traumatic lipomas.[9,10]

Lipomas have the ability to insulate themselves into small recesses and thus produce tumours of any size or shape by infiltration of spaces not tightly bound by protecting sheaths and fascia.[3] This is so with lipomas of the hand which occur in various anatomic locations within it subfascially in the deep palmar space.[10] The deep palmar space is divided into five zones and these are UMP (ulnar metacarpophalangeal), RMP (radial metacarpophalangeal), hypothenar, central (mid-palmar) and thenar spaces (figure 5).[8]

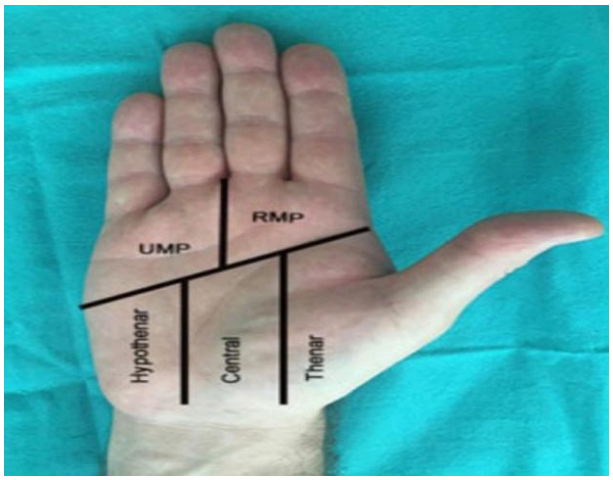

Figure 5: Diagrammatic illustration of the five compartments of the deep palmar space.

The long-term progression of lipoma involving the hand is due to the slow and painless growth pattern of it. The symptomatology of lipomas of the hand is determined by its location, size, histological type, and involvement of adjacent structures. Lipomas are usually slow-growing tumours, so they remain asymptomatic for a long time.[5] Patients seek medical attention when the tumour becomes large and affects hand function (as occurred in our patient), or if they present compression-related clinical signs, especially at the level of the nerves, i.e., paraesthesia, restricted range of movement and difficulty with usage of the affected hand (which was also part of the presenting complaints of our index patient).[7] Lipoma growing in confined spaces like carpal tunnel or tendon sheath may cause trigger finger, restricted mobility, muscle atrophy, nerve compression, nerve stretching/elongation, or bony erosion.[6-8] The compression exerted by lipoma on the neural elements and relatively large volume tumour in an unyielding compartment can cause pain and hypersensitivity disorders.[6] Giant lipomas with a mid-palmar or thenar location can cause nerve elongation and sensitivity disorders, and tendon rupture.[6]

The diagnosis of lipoma of the hand is a diagnosis of exclusion since other differential tumorous conditions of the hand are commonly encountered than lipoma. Other differential diagnosis includes ganglion cyst, giant cell tumour, fibroma and arteriovenous malformations. However, a good clinical acumen and radiological examination can simplify the diagnosis of lipoma of the hand. Plain radiograph of the hand shows a soft tissue shadow and presence of bony erosion (when there has been a chronic bony location). In most cases, ultrasound examination can confirm the diagnosis of lipoma of the hand with the lipoma appearing as a homogeneous, hyperechoic and well-defined mass without posterior enhancement or a Doppler signal.[6,8] For giant lipomas of the hand, magnetic resonance imaging (MRI) scan is the image modality of choice having better soft tissue resolution.[7,11] The MRI finding is that of a well-defined fine, homogeneous encapsulated mass with a predominantly lipomatous signal (hypersignal on T1- and T2-weighted images, and hyposignal on STIR images).[6] Fine septa are irregularly distributed within the tumour having discrete gadolinophilia due to the presence of blood vessels in the septa.[10] Features such as increased nodularity, globular, or nonfatty areas as well as decreased fat composition are suggestive of malignant transformation of a lipoma to a liposarcoma.[10,11] Other features that suggest the risk of malignant transformation include giant lipoma, intra- and/or inter-muscular location, and retroperitoneal lipomas.

Histologically, lipomas are composed of mature adipose tissues separated by thin fibrous septa and blood vessels may be present within the fibrous septa and typically surrounded by a fibrous capsule (figure 6).[2]

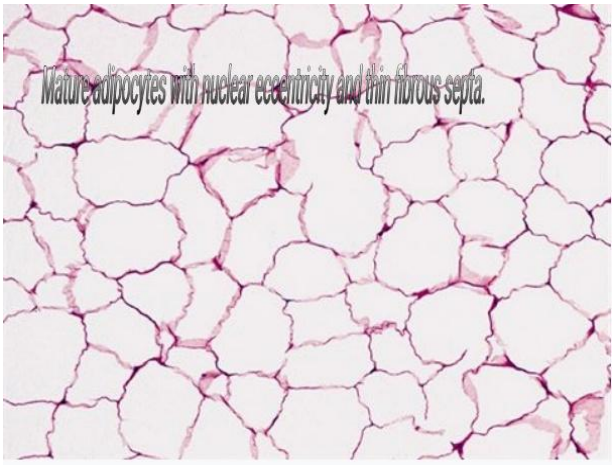

Figure 6: Histological features of lipoma showing mature adipocytes with compressed eccentrically placed nucleus (Signet ring sign) and thin fibrous septa

Other variants of lipomas include neural fibrolipomas, intramuscular and intermuscular lipomas, angiolipoma, chondrolipoma, osteolipoma and spindle cell or pleomorphic lipoma.[6] Neural fibrolipomas are composed of fibrofatty tissue that surrounds and/or infiltrates local

nerves. Lipomas that have a mixture of adipose tissue and skeletal muscle are considered intramuscular and/or intermuscular lipomas. Angiolipomas show an increased vascular component that can account for up to 5%-50% or more of the tumour volume and are usually multiple painful masses.[2,6] spindle cell lipomas consist of spindle cell and adipose tissue and are commonly found in the subcutaneous layer with possible extension into the dermis.[2]

Small asymptomatic lipomas of the hand may be observed and followed up without intervention. Beneficial to small lipomatous lesions of the hand is mesotherapy which involves the intralesional injection of a mixture of phosphatidylcholine or sodium deoxycholate to achieve lipolysis.[6] Surgical excision biopsy is indicated in the presence of discomforting pain, difficulty with effective usage of the affected hand, features of compressive neuropathy, bony erosion and cosmetic disfigurement.[12] Due to the complex anatomic organisation of the hand, a delicate and meticulous dissection must be performed during the surgical excision of the mass. A marginal excision biopsy is usually adequate for en masse extirpation of the tumour and symptoms resolution and ensures a limited chance of recurrence.[9] For patients with complex presentation such as carpal tunnel syndrome, decompressive intervention such as division of the flexor retinaculum and marginal excision of the tumour is appropriate.

Conclusion

Lipomas are benign fatty tumours that rarely occur in the hand. They typically present as slow-growing painless multicompartmental tumours. Their symptomatology in the hand is dependent on their size, location, histological type and involvement of adjacent structures. Ultrasound scan of the involved hand is beneficial in the preoperative evaluation of the patient. However, where available, MRI scan of the hand is the gold standard of preoperative radiologic evaluation of the lesion. The options of treatment of lipoma of the hand include mesotherapy, intralesional injection of phosphatidylcholine or deoxycholate, and meticulously performed marginal excision biopsy. When compression neuropathy is involved in the patient's complaint, division of the involved retinaculum is appropriate.

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