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A case of giant lipoma of medial compartment of thigh with extension to adductor canal

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ABSTRACT

Introduction: The deep intermuscular lipomas of medial or adductor compartment are very rare. Occasionally these lipomas can achieve a giant size. Case Report: We report a case of giant lipoma of adductor compartment of left thigh in a 50-year-old man. The giant size lipoma presented a diagnostic dilemma as it was subfascial and extended to two compartments of thigh, medial, and anterior. Also, it had to be differentiated from well-differentiated liposarcoma. Magnetic resonance imaging (MRI) could analyze the size and extent of lipoma. Fine-needle aspiration (FNA) reported the soft tissue mass as lipoma. The patient was treated by excision of the giant lipoma. The challenge was complete removal along with its extensions into adductor canal. Conclusion: A giant size lipoma of medial compartment of thigh achieving a large size of 30 cm long with extension into adductor canal. A careful excision from the neurovascular bundle has been done.

Keywords: Adductor canal, Giant lipoma, Intermuscular lipoma, Liposarcoma, Neurovascular compression, Thigh

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INTRODUCTION

Lipoma is the most common benign tumor of the adipose tissue and can occur anywhere in the body. Lipomas have prevalence rate of 2.1 per 1000 of population [1]. The only difference between subcutaneous fat and lipoma is that lipoma contains a few thin septa which are less than 2 mm thick. Lipomas are usually single but can be multiple in about 5–15% of patients [2]. Lipomas can be superficial or deep, the plane of demarcation being deep fascia. Deep lipomas can occur in intermuscular and intramuscular plane. Subcutaneous lipomas are most common occurring on back, neck, head, and shoulders. The subcutaneous or superficial lipomas are more common than deep lipomas occurring in muscular compartments. The intramuscular lipomas are deep seated within the muscles. Lipomas are very slow growing and may reach a size of 5–10 cm. A lipoma having length more than 10 cm or weighing more than 1000 g is defined as giant lipoma [3].

The giant variant of intramuscular lipoma is rare. There is always a confusion with well-differentiated liposarcoma. Rapid increase in size of a long-standing lipoma suggests a sarcomatous change [4]. Lipomas present as painless swelling but large size lipoma can compress the nearby nerves and can become painful [5]. Uncommonly giant lipoma of adductor compartment of thigh can press neurovascular structures in the adductor canal. These giant size lipomas in adductor compartment present a diagnostic challenge as these are deep seated. Instead of limiting to on adductor compartment, these intermuscular lipomas can invade the nearby compartment and also a muscle with intermuscular component. Magnetic resonance imaging can diagnose lipoma due to presence of thin septa and can also differentiate from well-differentiated liposarcoma which has thick and irregular septa. The intensity of signal can about fat necrosis with in lipoma [6]. The findings

of stranding, nodularity, and size of tumor can give diagnosis of lipoma or well-differentiated liposarcoma. These findings could make correct diagnosis in 69% of cases [7].

In this case report, we present a usual giant lipoma of thigh in the adductor compartment of left thigh, adductor canal displaced grossly to one side and extending to anterior compartment of thigh.

CASE REPORT

A 50-year-old man presented with history of swelling in the left thigh for last three years. The first thing observed by the patient was disparity in size of thigh. Later he felt a swelling in the left thigh. The swelling was growing insidiously. The patient's presentation to clinician was due to heaviness in leg on walking. On inspection, there was difference of 5 cm in mid-thigh circumference between left and right thigh. No changes in skin color or texture were seen. The inspection showed a small inconspicuous swelling in middle of left thigh. The palpation revealed a nontender, firm mass having smooth surface. This mass was not attached to skin but was present deep in the medial compartment of thigh. The popliteal and posterior tibial arteries were well palpable. There was no evidence of deep vein thrombosis in the leg veins. The motor and sensory examination of lower limbs was normal. The ultrasonography of the thigh revealed a large size soft tissue mass probably lipoma. The MRI of thigh revealed a large mass in the medial compartment of thigh between adductor muscles. A thick septum seen showed the extension of anterior compartment (Figure 1).

The magnetic resonance signal showed fat density and confirmed the diagnosis of well-encapsulated intramuscular lipoma, size 30 × 16 × 15 cm. The MRI showed displacement of adjacent muscles and adductor canal containing femoral neurovascular bundle (Figure 2).

The tissue diagnosis was made with FNA from the swelling which showed mature adipose cells and confirmed diagnosis of lipoma.

Routine hematocrit values, X-ray chest, and electrocardiogram (ECG) were done. Preanesthetic check-up was done and patient was assigned American Society of Anesthesiologists (ASA) grade II. The excision of lipoma was done under spinal anesthesia. A 20 cm long incision was given on the medial side of thigh. The soft tissue mass could be easily separated and excised. The extension into adductor canal was about 10 cm long and was removed completely en bloc with main soft tissue mass. This extension could be safely separated from femoral vessels and nerve (Figure 3).

A negative suction drain was inserted in the cavity. The deep fascia of thigh was closed using 2-0 polyglactin continuous suture. The skin staplers were used to close the skin incision. The postoperative period was uneventful. The drain was removed on fifth postoperative day and skin staplers on tenth postoperative day. There was no recurrence in six-month follow-up. The gross examination of excised specimen revealed the dimensions of 30 × 16 × 15 cm (Figure 4) and extension into adductor canal was 10 cm long. The excised specimen weighed 2300 g. The macroscopic appearance was typical of lipoma with a capsule. The histopathological examination reported this excised soft tissue mass as benign lipoma (Figure 5).

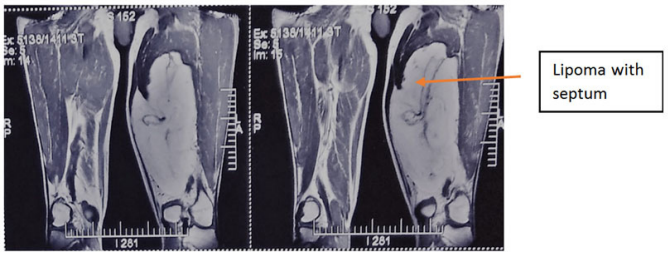

Figure 1: MRI showing giant lipoma.

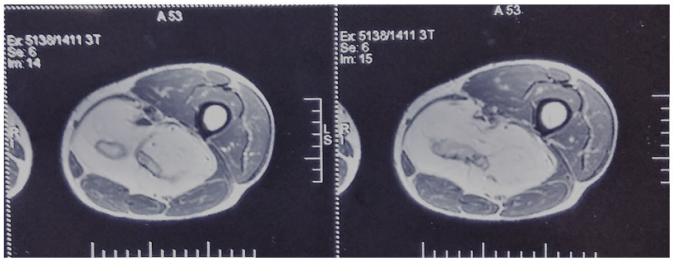

Figure 2: MRI showing displacement of muscles and neurovascular bundle.

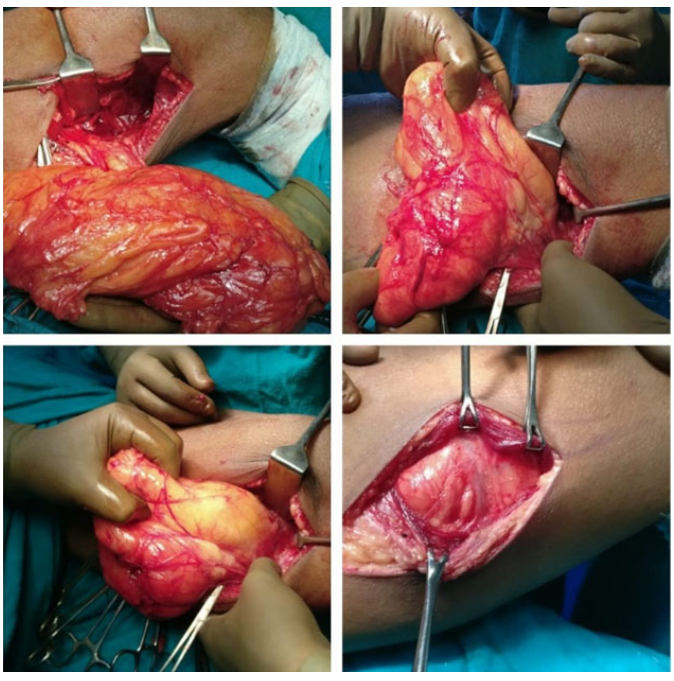

Figure 3: Operative photos showing excision of lipoma.

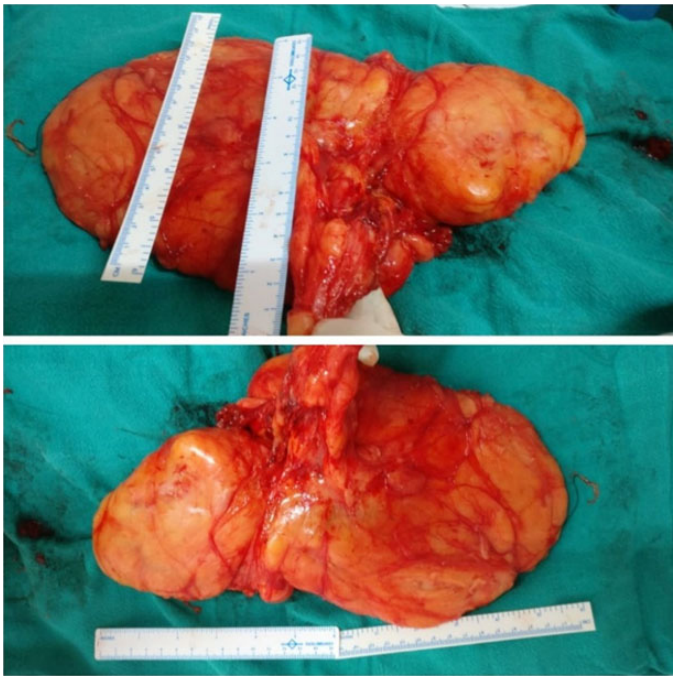

Figure 4: Dimensions of excised specimen according to scale.

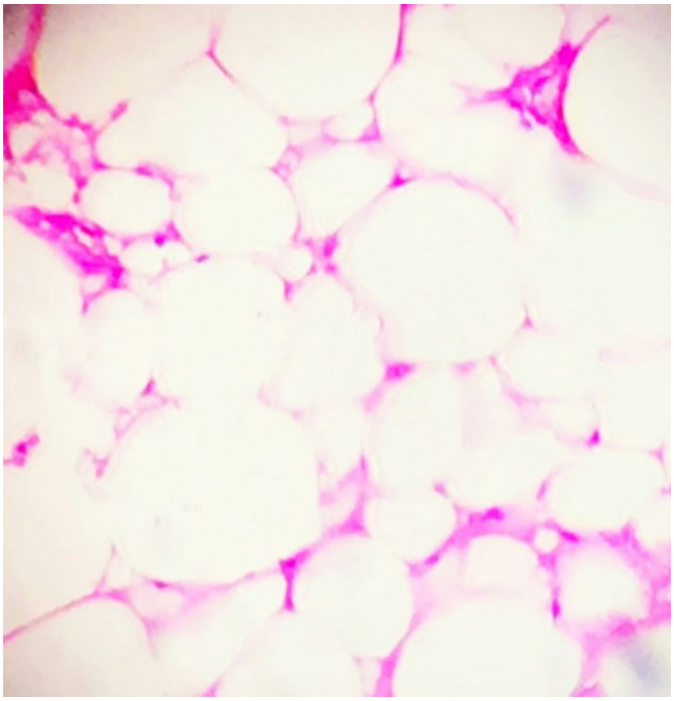

Figure 5: Microphotograph showing mature adipose tissue.

DISCUSSION

Lipomas constitute 50% of all soft tissue masses. They are difficult to differentiate from normal adipose tissue. The majority of these lesions are benign in nature. Most of lipomas remain small in size, but rarely achieve a large size of more than 10 cm to be called as giant lipoma. The deep subfascial intermuscular lipomas are rare. These intermuscular lipomas are also known to achieve a considerable size. The first giant lipoma of thigh occurring between the adductor muscles was reported to the size of head of an adult. Speed (1924) in his article mentioned a few cases of thigh lipomas reported by Senn, Skillern, Beriel and Delachanal [8]. Clinical diagnosis cannot diagnose the size and extent of deep-seated lipomas. Ultrasound is the initial scan used to decide size, anatomical plane, and tissue of origin. The ultrasound and MRI are able to portrait fat in these lesions [9].

Magnetic resonance imaging is considered as the gold standard diagnostic tool to determine tissue of origin and involvement of adjacent soft tissue and compartments. It can differentiate between benign, malignant soft tissue masses due to characteristic appearance. Tissue diagnosis should be made by FNA or biopsy which helps in planning the resection. The histopathology of resected specimen gives final diagnosis [10]. The attenuation of the capsule of lipoma is similar to muscle. Computed tomography of lipoma shows fat attenuation and MRI pulse sequence shows fat signal intensity. Magnetic resonance imaging may show a clear peripheral capsule and small septations generally less than 2 mm thick in lipoma [11]. In giant lipomas, fat necrosis can occur particularly over pressure points. The fat necrosis appears with cloudlike stranding and inflammatory changes in the surrounding area on MRI imaging. If fat necrosis is present, the differentiation from well-differentiated liposarcoma becomes difficult [12]. Magnetic resonance imaging is an important diagnostic tool and helps in management of giant lipomas. It also helps in deciding tissue of origin of mass, enhancement characteristics, and relation of mass to adjacent neurovascular bundle and musculoskeletal structures. The differential diagnosis includes lipoma, well-differentiated liposarcoma, and spindle cell lipoma. Lipomas are devoid of typical thickened septations and internal enhancement as compared to well-differentiated liposarcoma. Ryan et al. (2018) described the utility of MRI for differential diagnosis between lipoma and well-differentiated liposarcoma. The difference in intensity of signal at places increases the suspicion of sarcomatous change in lipoma. The MRI findings alone are not sufficient for diagnosis but should be used with tissue diagnosis [13].

For treatment of giant lipomas, there are two surgical options; open surgical excision and suction lipectomy. The open surgical excision has the advantage of good exposure and complete removal of giant lipoma. The suction lipectomy has good cosmetic result but incomplete removal of extensions, left out thick and fibrous capsule, trauma to neurovascular structures by tip of suction cannula can lead to high recurrence rate. So, open surgical excision is considered as the best treatment [14].

Kaeser et al. reported an intermuscular lipoma of medial right thigh present between the rectus femoris and vastus intermedius muscles. Intermuscular lipomas have incidence of 1.8%. They treated this by surgical excision [15].

Fimmanó et al. reported a giant atypical of right thigh. This giant lipoma had a size of 22 × 12 × 10 cm weighing

2740 g located deep to fascia in the right distal thigh. This patient presented with recurrent thrombophlebitis in leg with a large swelling in the thigh. The ultrasonography could identify the swelling which was confirmed by MRI as of benign soft tissue mass. The treatment of giant lipoma is surgical excision. The excision of this giant lipoma was done without muscle or periosteal resection. Because of high risk of recurrence, a postoperative follow-up is necessary [16].

Surgical excision is the treatment of choice for giant intramuscular lipomas. Marginal excision can be done for well circumscribed lipomas and wide excision with a free margin is required for the infiltrative type of lipoma to prevent recurrence [17]. Incomplete removal can lead to recurrence of lipoma. The recurrence rate reported is wide 3–62.5% in literature [18]. The most common reason attributed is left out tissue near neurovascular structures. Recurrence in short follow-up does not represent the true recurrence rate as long-term recurrence is well known from 14 months to 19 years [18]. None of the study have reported recurrence for a well-circumscribed lipoma. The intramuscular lipomas, though having tendency to recur, are benign tumors without a malignant potential. The malignant change in giant lipomas has been suggested without any definite evidence. An S-shaped incision was used to approach a huge lipoma in the anterior compartment of thigh. This surgical approach allowed a good visualization of bed of lipoma and helped in complete excision of the lipoma without any local complication. The S-shaped incision was considered better to straight incision in term of scar appearance [19].

In this case, the clinical presentation was increased in girth of left thigh and feeling of heaviness while walking. The swelling became palpable later on, but whole of lipoma never became palpable because the main mass was deeply located in subfascial adductor compartment of left thigh. The ultrasound of the left thigh revealed a large soft tissue mass having density equivalent to adipose tissue. The FNA diagnosed it as lipoma. The MRI was done to the extent of lipoma. The MRI revealed a giant lipoma of size $30 \times 16 \times 15$ cm in medial compartment of thigh extending to anterior compartment. It did not reveal its penetration into adductor canal. The excision of lipoma revealed its extension into adductor canal. However, there was no evidence of neurovascular compression neither clinically nor in MRI scan. The patient was followed up for six months. In this short follow-up there was no evidence of recurrence.

CONCLUSION

The giant intramuscular lipoma of adductor compartment of thigh is very rare. The MRI scan provides the best diagnostic tool regarding size and extent of lipoma. Magnetic resonance imaging can differentiate between lipoma and well-differentiated liposarcoma. The tissue diagnosis must be made with FNA cytology. The giant lipomas are treated by open surgical excision. Care is needed to see penetration of lipoma into adductor canal. Although lipomas are benign tumors still need follow-up monitoring for recurrence.

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Author Contributions
Bhavinder Kumar Arora – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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The corresponding author is the guarantor of submission.

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Conflict of Interest
Author declares no conflict of interest.

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All relevant data are within the paper and its Supporting Information files.