Giant Intramuscular Lipoma of the Gluteus: A Case Report and Literature Review

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Abstract: Lipomas are benign tumors of mesodermal origin composed of mature adipocytes. They are classified into superficial and deep types located in the subcutaneous and subfascial locations respectively. The subfascial is further subdivided into 2 subtypes intermuscular and intramuscular. Presented was a 63 year old woman with a right sided swelling of the buttock in the past 7 months. Clinical, imaging and histologic evaluation resulted in the definitive diagnosis of a giant intramuscular lipoma of the gluteus. The lesion was well circumscribed with a defined pseudo capsule an indication of a benign disease with minimal risk of recurrence when compared to the infiltrative type. Giant intramuscular lipoma should be considered as a differential diagnosis of a gluteal mass. CT scan was useful in the preoperative diagnosis that included the nature of the tumor due to the low attenuation of fat, homogenous echogenicity, well defined capsule that were in favour of a benign lesion than malignancy. This was in addition to the extent of the tumour. Surgical excision provided the definitive diagnosis.

Keywords: Giant, intramuscular, lipoma, gluteus, CT scan, excision.

INTRODUCTION

Lipomas are benign tumors of mesenchymal origin composed of mature or adult type adipocytes and are ubiquitous in their presence [1,2]. It is defined as giant when the lesion measures at least 10cm in the widest dimension or weigh a minimum of 1000g [3,4]. Lipomas are divided into superficial and deep types found in the subcutaneous and subfascial locations respectively [5]. The subfascial is further subdivided into 2 subtypes intermuscular and intramuscular [6]. They are the most common benign soft tissue tumors occurring in 2% of the population [7,8]. It accounts for 5% of soft tissue tumors and can be found in almost all organs, hence it is also named ubiquitous, universal or generalized tumors [9]. The cause of lipoma is still unknown [7]. The intermuscular lipoma is believed to originate in between the muscle fibers in the muscle bundles and penetrate adjacent muscle passing through the intermuscular septa [6]. Lipomas are usually, small and soft in consistency. Occasionally, they may be firm and impressive in size in superficial or deep locations [6,7]. Majority are asymptomatic while some may be symptomatic from the compression of adjacent tissues [7,9]. Imaging modalities are very important for the diagnosis of deep seated lipomas [9]. Giant intermuscular lipoma should be differentiated from liposarcoma in view of the therapeutic implication of the later, a malignancy [2,10]. Diagnostic challenges may arise from in conclusive features from advanced imaging including inadequacies of preoperative biopsy occasioned by the deep location of the intramuscular lipomas [11]. Histopathology is the gold standard for diagnosis and surgical excision is the treatment of choice [12]. The challenges of treatment include the risk of recurrence from inadequate excision of a benign lesion or the occurrence of a malignancy. This is in addition to the risk of injury to adjacent neurovascular structures [13]. Some patients may present with preoperative features of neurovascular compression [14,15]. We present this report to highlight the need to consider intramuscular lipoma as a differential diagnosis of a gluteal mass. Furthermore, to stress the importance of imaging in the management of this lesion.

CASE REPORT

Herein is a 63 year old woman with a right sided swelling of the buttock in the past 7 months. The swelling was noticed while applying body lotion. It was initially the size of her thumb and increased gradually to the present size. The swelling was painless but occasionally associated with heaviness of the right thigh and leg. There was no swelling in other parts of the body, no previous history of trauma to the site or that of intramuscular injection. In addition, there was no history of weight loss or drenching night sweat or contact with someone with chronic cough. Furthermore, there was no history suggestive of exposure to radiation or petrochemicals nor family history of cancer.

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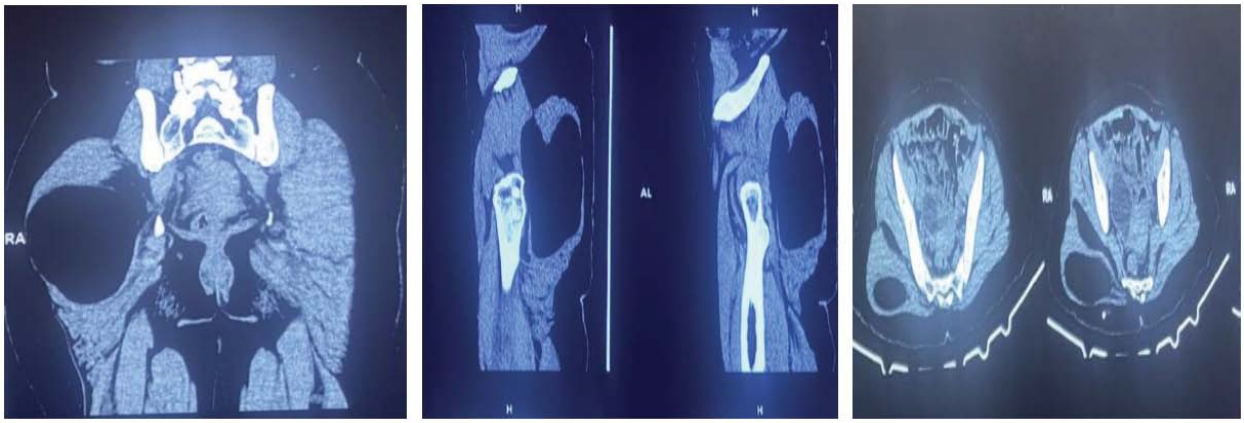
She is Para 4^{+0} (all alive) and 5 years postmenopausal. Patient had right eye cataract surgery 3 years ago.

Examination revealed a healthy looking woman, afebrile, not pale, no pedal oedema or peripheral lymphadenopathy. There was an oval mass in the right gluteus with a normal overlying skin. It was nontender, firm, ill-defined border, intramuscular mass. It measured about 22x10cm in the widest dimensions, Figure **1**. There was no inguinal lymphadenopathy. Lasegue sign or strait leg raising test (SLRT) was negative. Neurovascular evaluation of the right lower limb was unremarkable. Head and neck, chest and abdominal examination were unremarkable. A clinical diagnosis of a right gluteus mass likely lipoma was madeto rule out liposarcoma. The other differentials were malignant fibrous histiocytoma, epidermoid cyst and muscle hernia.

Figure 1: Clinical photograph showing right gluteal swelling.

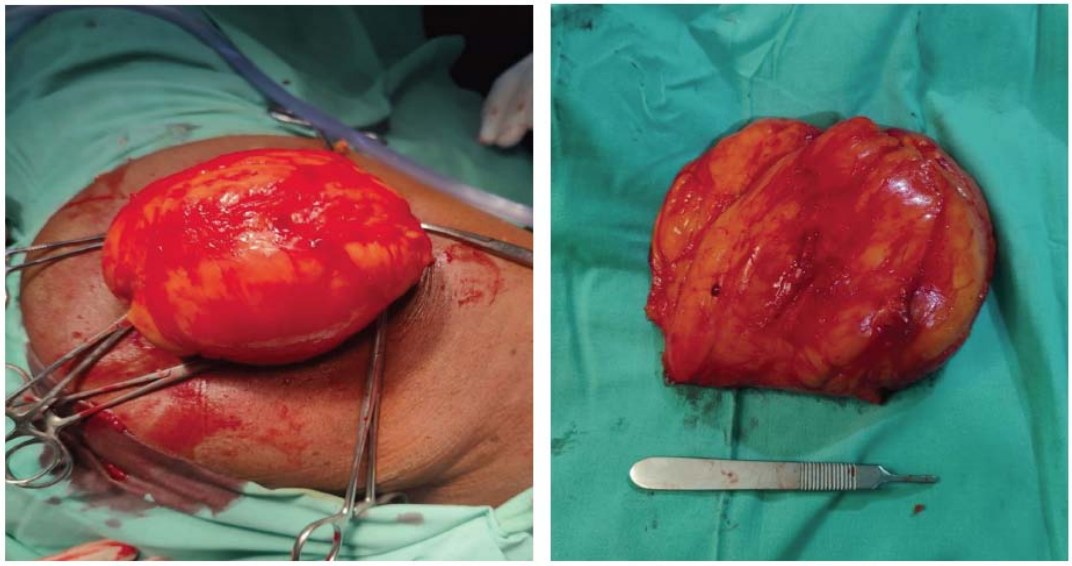
Investigations which included full blood count (FBC), urea/electrolytes/creatine, serology I&II and urinalysis were normal. Gluteal ultrasound scan (USS) revealed a large avascular mass that displayed peripheral flow on color doppler interrogation. The mass was centered in the gluteus and showed a distorted pattern with no evidence of destruction of the underlying bones nor infiltration of the overlying skin. No calcification was seen. The impression was aright sided intramuscular lipoma. The CT scan findings showed a large non-enhancing mass within the belly of the right gluteus maximus that measured 12.95 x 11.56 x 12.23cm with attenuation of fat (HU -101.75). The mass extended beyond the margin of muscle bridging with the intramuscular mass plane between gluteus maximus and minimus muscles. The diagnosis was large intramuscular mass with fat attenuation, intramuscular lipoma, Figures **2a, 2b, 2c**.

She had an excision biopsy and the wound was closed with a drain in situ under regional anaesthesia in the left lateral position in view of the location of the lesion confirmed clinically and with CT scan. Findings at operation were a yellowish soft globular, smooth, well encapsulated mass that measured about 13cm in the widest dimension, Figures **3a** and **3b**. Postoperative period was uneventful and she was discharged to the surgical outpatient. The result of the histology reported a macroscopy that showed a fibro fatty nodule that weighed 600gm and measured 15.5 x 15 x 6cm. The external surface appeared encapsulated with a smooth surface with a firm consistency. The cut surface appeared yellow, Figure **4a**. Histology showed a mesenchymal tissue composed of lobules of adipocytes. The adipocytes had clear vacuolated cytoplasm with eccentric nuclei. There was no



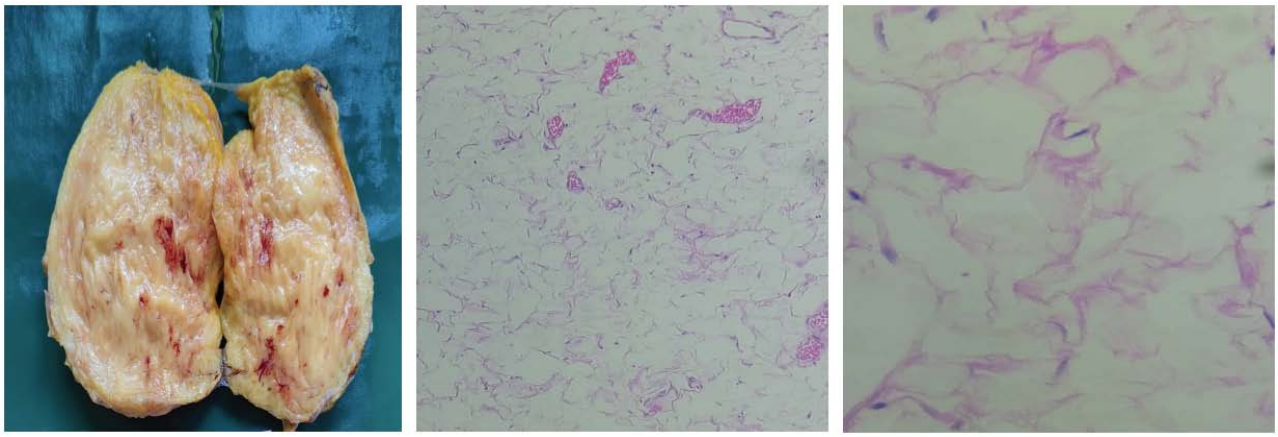
a **b** **c**

Figure 2: CT scan. **a**- Coronal section that showed right intramuscular mass with fat attenuation, intramuscular lipoma. **b**- Lateral sagittal section that showed right intramuscular mass with fat attenuation, intramuscular lipoma. **c**- Transverse section that showed right intramuscular mass with fat attenuation, intramuscular lipoma.



a b

Figure 3: a- showing the prolapsed intramuscular mass. **b**- Excised intramuscular mass.



a **b** **c**

Figure 4: a- The cut surface appeared yellow, **b** H&E x 100. **c**- H&E x 400. Histology showed a mesenchymal tissue composed of lobules of adipocytes. The adipocytes had clear vacuolated cytoplasm with eccentric nuclei. There was no evidence of malignancy, right gluteal mass- lipoma.

evidence of malignancy, right gluteal mass- lipoma, Figure **4b** and **4c**. A definitive diagnosis of intramuscular lipoma of the right gluteus was made and patient advised on the need for an extended follow-up. Follow up for the period of 6 months has been satisfactory.

DISCUSSION

Lipomas are benign soft tissue neoplasms from the germ cell layer of the mesoderm and it is composed mainly of mature adipocytes [4,6,9]. They are categorized into subclasses of subcutaneous and subfascial, while the latter is further categorized into intermuscular and intramuscular [4,9]. The intramuscular lipomas are uncommon with an incidence of 1% of all lipomas with majority that occurred between the ages of 40-70 years [4,6]. The neoplasm has been described in the upper limb in a pediatric[4] and in an adult [7], right leg [1], thenar eminence [5], tongue [10], thigh [6] and the hip [9]. The tumour rarely presents in the head and neck region [10]. In the female, adipose tissue accumulation is higher than in the male, hence they are more common in the female [6].

The cause of lipoma is not known [7]. However, there is relationship between lipoma and heredity. A report indicated that lipoma showed genetic abnormalities in *HMGA2* gene located at 12q14.3 and

involved in the pathogenesis of this neoplasm [16]. The mechanism for intramuscular lipoma is not clear. Trauma has been reported as related factor after blunt trauma that resulted in ruptured fibrous septa that prevents fat migration, in addition tears of the anchorage between skin and deep fascia result in the proliferation of adipose tissue [2]. The fat found in the lipoma is different from normal body fat as its lipids are not available for metabolism [10].

In the early stage, tumor progression is slow and resulted in no symptoms that were easily over looked hence the delay in presentation. Gradual enlargement may result in the compression of the adjacent neurovascular structures including the lymphatics and may result in a swelling, limited movement especially during ambulation or standing for long. It may be associated with abnormal feeling or sensation [2,6,9]. The clinical features of intramuscular lipoma may be like that of a well differentiated liposarcoma [2,7]. The exclusion of malignancy is the primary concern in the diagnosis of intramuscular lipoma[1]. Giant intramuscular lipoma needs to be differentiated from malignant fibrous histiocytoma and other benign soft tissue lesions as epidermoid cyst, hematoma, muscle herniation, lipoblastomatosis and deep hemangiomas [1].

Advanced imaging is required for the diagnosis of intramuscular lipomas [4]. The use of USS, CT, MRI in addition to the diagnosis, provided the estimation of tumor extension that included the involvement of the surrounding structures [2]. USS is the initial imaging procedure. It is cost-effective compared to CT and MRI. Oval mass with uniform echo and clear boundary are typical findings with usually no blood flow or small amount of flow could be detected inside [9]. However, for lipoma located deep in the fascia, CT and MRI should be considered to further evaluate the nature of the lesion [2,7]. MRI is the preferred modality of soft tissue visualization [4]. Adipose tissue has a low attenuation on CT with less than -20HU, typically between -65 and -120HU [2,10] in keeping with the result of the index patient that was -101.75HU. The findings on MRI for intramuscular lipoma showed a fat signal intensity, usually short T_1 and big T_2 weighted images with clear boundaries [2,7]. Giant lipomas with benign USS and CT findings of septa, homogenous echogenicity and well defined capsule are sufficient to have excision prior to core biopsy as was our experience. Large size heterogenicity, irregular thickened septa, high degree of vascularity and low fat content are indicators for initial core biopsy prior to excision [6]. However, the MRI finding may not be sufficient to differentiate between well circumscribed and infiltrating forms of intramuscular lipoma as they do not correspond to histological findings [4]. Features of intramuscular lipoma may resemble a well differentiated liposarcoma and makes it difficult to distinguish [7]. The gold standard for diagnosis is histopathology. Typical features were tumor composed of adult fat cells divided into lobules by fibrous connective tissue septa [10]. Irrespective of their location, lipomas have a similar histology and gross appearance [5]. In addition, well defined intramuscular lipomas are discrete masses of mature lipocytes with distinct demarcation from muscle without entrapment of muscles or infiltration. The fibrous stroma is condensed to form a capsule. Both types are without nuclear atypia or lipoblasts [4].

Small lipomas in the superficial location are easy toexcise, the huge and deep lipoma may present diagnostic and treatment difficulties especially when they are adjacent to important structures in the body [9]. The treatment modality of choice in the management of giant lipoma is marginal surgical excision [1]. The lesion is usually well circumscribed with a defined pseudo capsule and easily dissected during surgery as was our experience [2]. The dissection should be diligent to avoid important adjacent neurovascular or muscular tissue that may result in functional impairment [2]. Liposuction is a treatment modality for giant lipomas but must be used judiciously [1,9]. The major concern of liposuctionis that of incomplete removal and recurrence may be more frequent than after excision. A combination of liposuction and excision is a safe modality for lipoma removal[17]. A small incision for liposuction provides a satisfactory aesthetic outcome in most cases. Following a reduction in size from liposuction, the residual lipoma and the capsular tissue can be removed without expanding the skin incision. The resultant effect is a combination of cosmetic and minimal operation time. The major drawback of liposuction is that the specimens are fragmented and may confound histological examination. Furthermore, liposuction alone leaves a residual lipomatous and capsular tissue that may predispose to recurrence[17]. Surgical removal of the tumor ought to be complete as residual disease may result in recurrence. The recurrence of intramuscular lipoma following surgical excision is with a recurrent rates of 3% on the low side and 62.5% on the high side are most likely due to incomplete surgical excision [2,4]. In this setting,

extended duration of follow up is mandatory [2]. In the management of recurrent disease, further histology is needed and in event of malignancy, referral to oncology for treatment is required [6]. Multiple recurrences requiring surgery is an indication for radiation [9]. The prognosis is generally good; however, recurrence is not excluded [9].

CONCLUSION

Giant intramuscular lipoma is rare and should be considered as a differential diagnosis of a gluteal mass. CT scan was useful in the preoperative diagnosis in addition to the delineation of the extent of the tumour. Complete surgical excision is the treatment of choice as it provided the definitive diagnosis. Furthermore, the need for multidisciplinary management is emphasized for better outcomes.

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DECLARATION OF CONFLICT OF INTEREST

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CONTRIBUTORSHIP

All authors contributed to different aspect of the report.

ETHICAL STATEMENT

The requirement for ethics approval was waived because this study was a case report of a patient managed by our team, not an interventional study (i.e., no intervention or experimentation was carried out on the patient for the purpose of this study).

INFORMED CONSENT

The patient provided both verbal and written informed consent for the publication of this case and all accompanying images.

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