



## Case series

# Intramuscular lipomas posing diagnostic and pre-operative counselling challenges in a low-resource setting: A case series

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## ABSTRACT

**Introduction:** Intramuscular lipomas (IMLs) are uncommon primary adipose tissue tumours deep within the muscle. A high likelihood of misdiagnosing them as other benign and malignant masses necessitates imaging studies to confirm the diagnosis and plan treatment. Ultrasonography is useful but CT and MRI provide a more accurate diagnosis. While diagnostic tests are suitable, they may not always be accessible or affordable in low-resource settings. We present three cases of IMLs that emphasise the difficulties posed by limited resources and the significance of a comprehensive medical history and physical examination in low-resource settings.

**Presentation of cases:** The patients included a 57-year-old male with a distal right thigh mass, a 65-year-old female with a proximal right thigh mass, and a 60-year-old female with a mass at the left scapular area. The three patients underwent surgical excision and had an uneventful postoperative course, with no reported recurrence during their ongoing follow-up.

**Discussion:** The management of IMLs is not complicated if the requisite resources are available. Conversely, in low-resource settings with limited diagnostic facilities and human expertise, management may take a challenging path. Patient 1, despite undergoing diagnostic tests confirming IML, initially declined treatment due to challenges with pre-operative counselling. Patients 2 and 3 lacked health insurance and could not afford diagnostic imaging tests.

**Conclusion:** Healthcare professionals in low-resource settings should familiarise themselves with the clinical characteristics and pathology of IMLs to minimise misdiagnosis and ensure appropriate counselling is provided to patients. IMLs are slow-growing mostly asymptomatic benign swelling. On physical examination, they are usually non-tender, soft, masses, not fixed to the bed or overlying tissue. The overlying skin is normal and lymphadenopathy is absent.

## 1. Introduction

Intramuscular lipomas (IMLs) are uncommon deep-seated tumours originating within the muscle [1]. They account for <1 % of all lipomas and about 1.8 % of all primary adipose tissue tumours [2]. Most IMLs are located within a single muscle (well-circumscribed variant) but adjacent muscles and intermuscular areas may be infiltrated (infiltrative and mixed intramuscular lipomas) [3,4]. Most IMLs occur between ages 40 and 70, although they may occur in all age groups [2]. There appears to be no gender or anatomical site predilection although IMLs arise primarily in the large muscles of the limbs and trunk [1,3,5]. Neither the

exact cause nor pathogenesis has been conclusively elucidated [2,6]. Adjacent tissues or peripheral nerve compression by an IML may cause pain [7,8]. IMLs tend to be neglected until the mass becomes large enough to cause symptoms [1,9].

IMLs can be misdiagnosed as other benign and malignant masses of soft tissues [2]. Hence, imaging studies are important to confirm the diagnosis and plan treatment [3,10]. Plain radiographs are usually unremarkable. While ultrasonography is a useful diagnostic modality for the initial evaluation of IMLs, computed tomography (CT) scan and magnetic resonance imaging (MRI) accurately identify adipose tissues and help define the relationship to the adjacent structures [2,10,11].

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**Table 1**  
Summary of the three cases.

Cases	1	2	3
<b>Patient information</b>			
Age	57 years	65 years	60 years
Gender	Male	Female	Female
Occupation	Government worker	Petty trader	Petty trader
Health insurance	Partial	None	None
Healthcare financing	Easy	Difficult	Difficult
<b>History</b>			
Presenting complaint	Painless distal right thigh mass, not impairing daily functioning	Painless proximal right thigh mass, not impairing daily functioning	Initially a painless diffuse swelling at the left scapular area. It progressively enlarged and caused left shoulder pain.
Time to presentation	10 years	8 years	3 years
Symptoms suggestive of malignancy	None	None	None
Past medical history	Not remarkable, no comorbidity	Unremarkable, no comorbidity	Unremarkable, no comorbidity
Family history of such mass	Absent	Absent	Absent
<b>Physical examination</b>			
Anatomical location	Anteromedial parts of distal one-third of the right thigh	Anterior parts of distal one-half of the right thigh.	Left scapular region above the scapular spine.
Consistency, mobility, tenderness, differential warmth	Soft, partly mobile non-tender and had no differential warmth.	Soft, fixed, non-tender and had no differential warmth.	Firm, fixed, non-tender mass without differential warmth
Neurovascular functions distal to the mass	Intact	Intact	Intact
Regional lymph node enlargement	None	None	None
<b>First-contact care before coming to our centre</b>			
Health facility type	Tertiary	Peripheral private facility	Peripheral private facility
Diagnosis	Lipoma	Cancer	Rhabdomyosarcoma
Counsel offered/patient decision	Excision and possible limb amputation/patient declined and came to us	Verbal referral/patient agreed and came to us	Written referral following a failed attempt at excising a mass/patient agreed and came to us.
<b>Investigations</b>			
Basic lab tests	Normal	Normal	Normal
Plain radiograph	Unremarkable.	Unremarkable.	Unremarkable.
Ultrasonography	Large, encapsulated, solid mass with a lobulated outline and an echogenicity similar to the subcutaneous fat layer. Femoral vessels are within the mass posteriorly.	Well-defined, solid, heterogeneous soft tissue lesion with similar echogenicity to the subcutaneous fat layer. Femoral vessels are displaced posteromedially. The colour flow of the femoral and	A 31 mm × 69 mm oval-shaped solid mass with well-defined margins within the muscles of the left scapular region. It demonstrated a poor colour flow and lacked bony attachment.

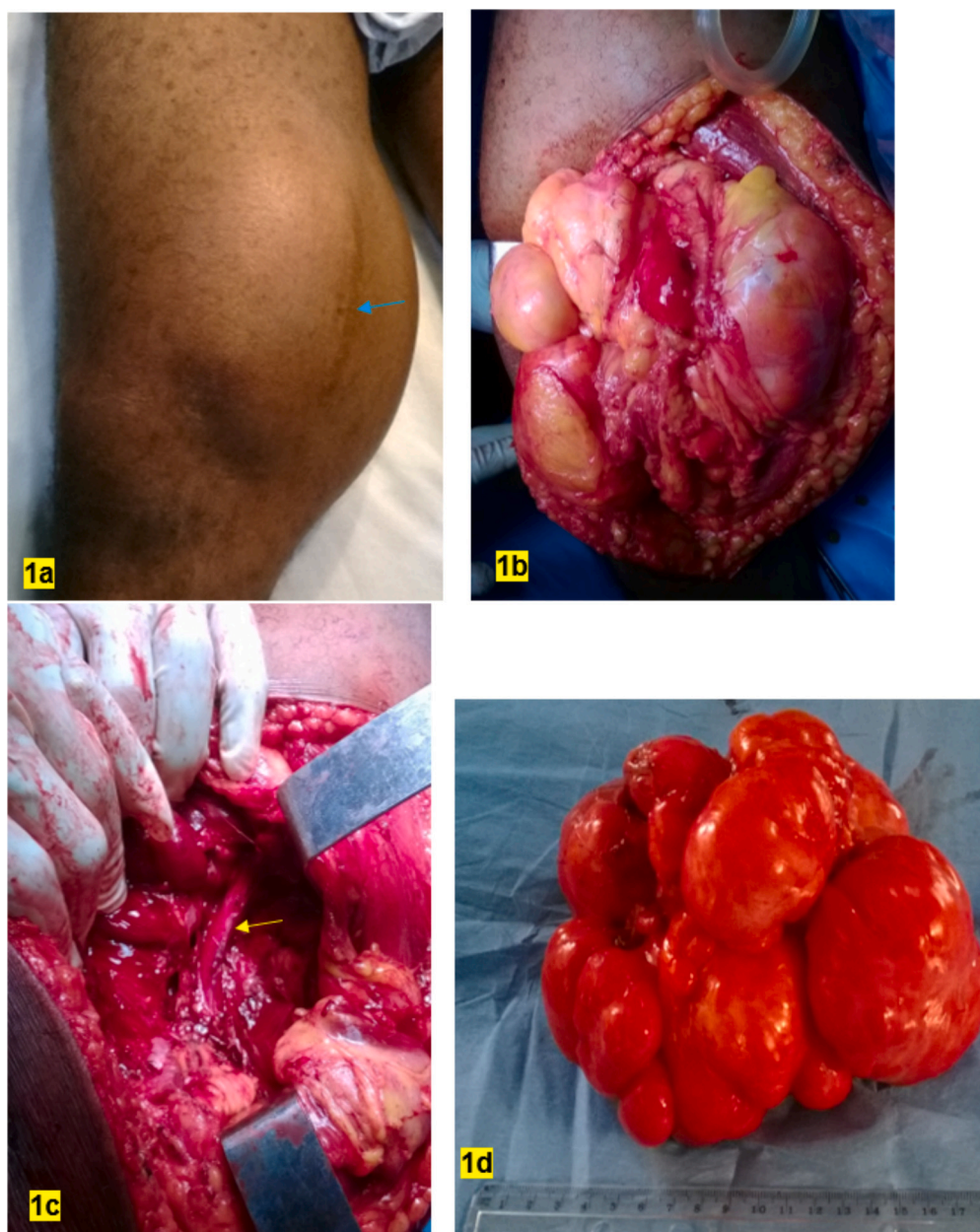
**Table 1 (continued)**

Cases	1	2	3
CT	Affordable, done, suggested a lipoma	Unaffordable	Unaffordable
MRI	Diagnosed the mass as IML and noted that it surrounded the femoral vessels.	Unaffordable	Unaffordable
Surgical biopsy	Diagnosed the mass as IML.	Unaffordable	Unaffordable
<b>Treatment and outcome</b>			
Surgery, by surgeon >5 years post-qualification	Excision	Excision	Excision
Anaesthesia	Spinal	Spinal	General
Intra-operative findings	A large, multi-lobulated lipoma is present in the adductor canal, infiltrating the Sartorius, Vastus medialis, and Adductor longus muscles. The femoral artery lies in its posterior part (Fig. 1)	A huge multi-lobulated lipoma lying within the Quadriceps, deep to the Sartorius, infiltrates the Adductor longus. It extended deeply in the intermuscular plane to the femur. The femoral vessels are displaced posteromedial (Fig. 2).	An oval-shaped, solid, yellow, fatty mass with well-defined margins within the Supraspinatus (Fig. 3).
Post-operative period	Uneventful	Uneventful	Uneventful
Histopathology of the specimen	Lipoma	Lipoma	Lipoma
Ongoing follow-up	78 months	36 months	6 months
Recurrence	None yet	None yet	None yet

Despite the diagnostic strength of CT and MRI scans, they often cannot differentiate a well-differentiated liposarcoma from IMLs, prompting some authors to suggest surgical biopsy or fine-needle aspiration cytology [12]. Surgical excision remains the mainstay of treatment for symptomatic masses and also for aesthetic reasons [1–3].

In low-resource settings where diagnostic imaging tests may be unaffordable for patients and human expertise is limited, healthcare professionals may have difficulty diagnosing IMLs or providing apt pre-operative counselling. Anxiety and fear of malignancy may also be encountered in patients with huge IMLs due to inadequate knowledge of the pathology. We report three cases to highlight some challenges posed by resource scarcity in caring for patients with IMLs. The cases had presented diagnostic or pre-operative counselling challenges to physicians at previous hospitals visited by the patients before they came to our centre. The aim is to (i) highlight the importance of conducting a thorough medical history and physical examination, especially for patients with limited financial resources who may be unable to afford expensive diagnostic tests before starting treatment, and (ii) to emphasise that healthcare workers in under-resourced areas should be familiar with IML pathology to decrease misdiagnosis and offer proper patient counselling. The work has been reported in line with the PROCESS criteria [13].

The study centre is a mission teaching hospital in a semi-urban city in south-western Nigeria which offers subsidised therapy to patients. The city's residents include artisans, taxi drivers, motorcyclists, government



**Fig. 1.** Intramuscular lipoma of the distal right thigh (Patient 1). The blue arrow (1a) points at the scar of the surgical biopsy. The yellow arrow (1c) points at the femoral artery. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

workers, small-scale farmers, and traders. Health insurance was unavailable, except for a few civil servants with limited coverage for some surgical conditions. The hospital lacked CT or MRI facilities; those who could afford the tests typically travelled to larger cities for them.

## 2. Presentation of cases

The study is a prospective single-centre case series of three consecutive patients. Table 1 summarises the cases.

## 3. Discussion

Our patients' demographic characteristics and intra-operative findings align with what has been reported in the literature [2,14]. The IMLs in Patients 1 and 2 appeared to be the mixed intramuscular variant while patient 3 had a well-circumscribed IML [3,4]. IMLs occur both in the upper and lower limbs but more often, in the lower limbs, with the thigh

being the most common site [14]. Patient 3 sought care when she started experiencing shoulder pain as the mass increased in size. There have been previous reports of IMLs in the Supraspinatus muscle causing impingement syndrome [7,15]. Her pain subsided following the excision of the IML.

The management of IMLs is not complicated if the requisite resources are available. Conversely, in low-resource settings with limited diagnostic facilities and human expertise, management may take a challenging path. Patient 1 could afford the necessary diagnostic tests because he had health insurance that covered part of his bill. As such, the diagnosis of IMLs was confirmed pre-operatively, and the tests further provided information about the anatomical relations of the mass that aided pre-operative planning. Studies have shown that CT and MRI can identify adipose tissues and define the anatomical relationship to the adjacent structures [2,10,11]. He also underwent a needle biopsy, which confirmed the mass as a lipoma rather than a liposarcoma, a distinction that is often challenging for CT or MRI to make [12,14].





Fig. 2. Intramuscular lipoma of the proximal right thigh (Patient 2).

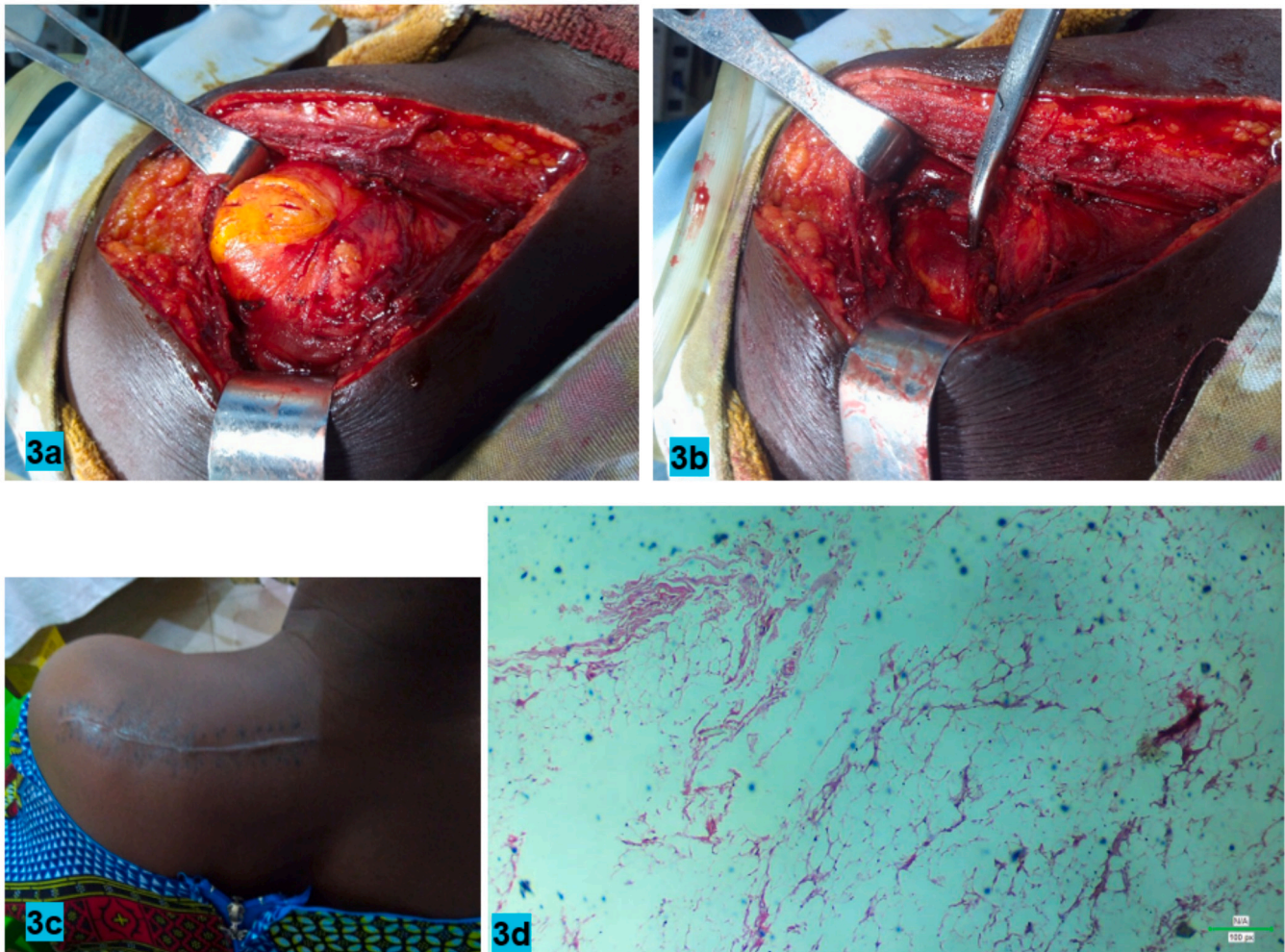
In a series of 51 cases by Ramos-Pascua et al. in Spain, MRI was routinely used during pre-operative evaluation, and to monitor the surgically treated patient for recurrence post-operatively. They also confirmed the diagnosis of lipoma through a pathological study [14]. A 42-year-old male patient with a deep-seated intramuscular lipoma (IML) that penetrated the intercostal muscle was reported by Hwang et al. in South Korea. The patient underwent multiple CT scans to monitor the growing mass. In addition, he had a thoracoscopy, which revealed that the lipoma did not penetrate the parietal pleura [1]. The findings from these investigations guided the surgeons during the surgical excision of the mass. While these diagnostic tests are not a luxury, they are often lacking in low-resource settings. Therefore, surgeons must perfect their clinical diagnostic skills to effectively treat the many patients they encounter.

Despite financial advantages, a lack of expertise in pre-operative counselling led to Patient 1's initial refusal of surgical excision at the tertiary hospital he initially visited. A doctor there had mentioned that limb loss could be a possible complication of the surgery. However, it is important to note that IMLs are soft masses that can be easily teased out

from surrounding tissue, and there are no documented cases of limb loss due to surgical excision of IMLs [2,14]. After being informed about the low likelihood of amputation after lipoma surgery, the patient agreed to undergo the surgical excision he had previously declined.

Patients 2 and 3 represent the lack of human expertise and access to diagnostic facilities often encountered in low-resource settings. Neither patient had their diagnosis of IMLs confirmed at the other hospitals they had visited before coming to ours. Patient 2 was prescribed drugs to "melt" the mass, while the doctors who referred Patient 3 made a presumptive diagnosis of lipoma and attempted to remove it. However, due to limited knowledge of IMLs, they abandoned the procedure when the incision reached the muscle without finding a lipoma. McTighe and Chernev have correctly noted that IMLs are frequently misdiagnosed as other benign and malignant lesions due to a lack of familiarity with the pathology [2].

Patients 2 and 3 lacked social welfare infrastructure and could not afford a CT or MRI out-of-pocket. As a result, they asked for a care plan that avoids the expensive tests. The decision for diagnostic surgical exploration of the mass was based on a lower likelihood of malignancy



**Fig. 3.** Intramuscular lipoma of the left scapular region (Patient 3). The Haemostat point at the supraspinous fossa.

following a detailed history, thorough physical examination, laboratory tests, and ultrasonography.

#### 4. Conclusion

Although IMLs are uncommon, they are benign tumours with well-described pathology. IMLs present as slow-growing asymptomatic swelling. Huge deep IMLs occasionally cause pain owing to adjacent soft tissues or peripheral nerve compression [7,8]. They may also limit the range of motion and restrict function [9]. Physical examination usually reveals a non-tender, soft, palpable mass, not fixed to the bed or overlying tissue. The overlying skin is normal and lymphadenopathy is absent [2]. While the typical characteristics of IMLs can be identified through clinical, histological, imaging, and cytogenetic examination [2], these methods may not always be accessible or affordable in low-resource settings. Healthcare professionals in these settings need to familiarise themselves with the clinical characteristics and pathology of IMLs and have a high index of suspicion when they encounter such masses. Doing so will minimise misdiagnosis and ensure that appropriate counselling is provided to the patients.

#### Consent

Written informed consent was obtained from the patients for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Ethical approval

Ethical approval for this case series was provided by the Ethical Committee of Bowen University Teaching Hospital, Ogbomoso, Nigeria.

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#### Author contribution

All authors contributed to the study design, writing of the paper, and final approval of the case report.

#### Guarantor

Stephen Adesope Adesina

#### Research registration number

N/A.

#### Conflict of interest statement

None.

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