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Case report

Rare case of thigh lipoblastoma in an infant: A case report

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ABSTRACT

Introduction and importance: Lipoblastoma is a rare, benign tumor that primarily affects infants and young children, representing a small percentage of soft tissue tumors in this population. Its early diagnosis and surgical management are crucial for favorable outcomes, as lipoblastoma can lead to significant complications if left untreated.

Case presentation: We report the case of an 18-month-old female toddler who presented with a progressively growing, painless mass in the left medial thigh, which had developed over six months. Imaging studies, including CT and MRI, revealed a well-defined, hypodense lobulated mass consistent with lipoblastoma. Surgical excision was performed, and the mass measured approximately 7 by 6 cm. Histopathological examination confirmed the diagnosis of lipoblastoma. The patient experienced a successful recovery without recurrence during a one-year follow-up period.

Discussion: Lipoblastoma typically presents as a painless subcutaneous soft tissue mass that progressively grows. Symptoms often relate to the tumor's location and size or the mass effect on surrounding structures. Imaging studies, particularly CT and MRI, play a crucial role in making a presumptive diagnosis by revealing the tumor's characteristics and components. Total excision remains the treatment of choice for lipoblastoma.

Conclusion: Lipoblastoma should be included in the differential diagnosis of rapidly growing, painless masses in children under three years of age. The treatment of choice is complete surgical resection of the tumor, which is crucial for achieving favorable outcomes and reducing recurrence risk.

1. Methods

This case report is conducted following the SCARE criteria for surgical case reports [1].

2. Introduction

Lipoblastoma is a rare, benign neoplasm derived from embryonic white fat, primarily affecting infants and young children. They account for approximately 4 % to 6 % of soft-tissue tumors in this population, with a slight male predominance [2,3]. These tumors are characterized by rapid growth and can vary in symptoms based on their location, often causing deformities or compression of adjacent structures. Clinically, lipoblastomas typically present as painless masses, most commonly located in the extremities, although they can also occur in the head and neck region [3].

There are two clinical variants: lipoblastoma, which is encapsulated and superficial, accounting for about 70 % of cases, and lipoblastomatosis, which infiltrates surrounding muscle tissue. Both variants share similar histological features [2].

Diagnosis is often determined by clinical and radiological findings, particularly through magnetic resonance imaging (MRI). However, definitive diagnosis relies on histological examination, which reveals well-defined lobules of adipocytes, uniform differentiation, and the absence of atypical cells and significant lipoblasts [4,5]. Here, we report a case of a left thigh lipoblastoma in an 18-month-old female toddler, highlighting its clinical presentation, imaging characteristics, and the importance of differential diagnosis in pediatric cases.

3. Case presentation

An 18-month-old female child presented with a gradual enlargement

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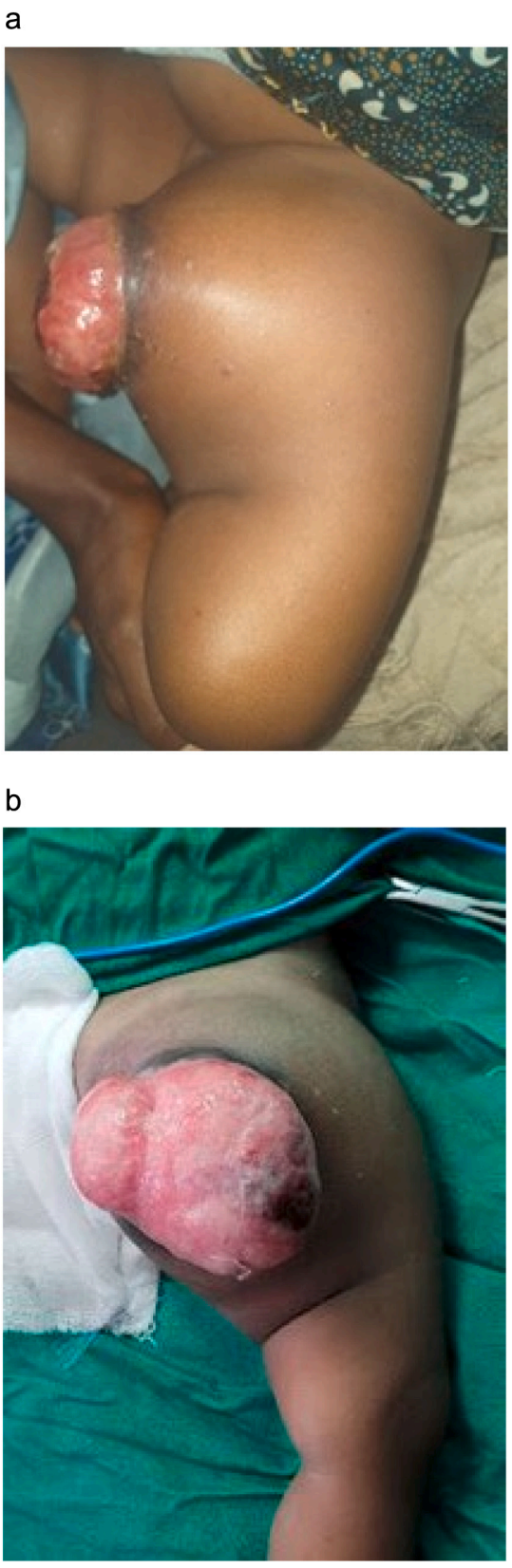

Fig. 1. a Showing the preoperative huge mass over left anteromedial thigh.
b Showing the preoperative huge mass over left anteromedial thigh.

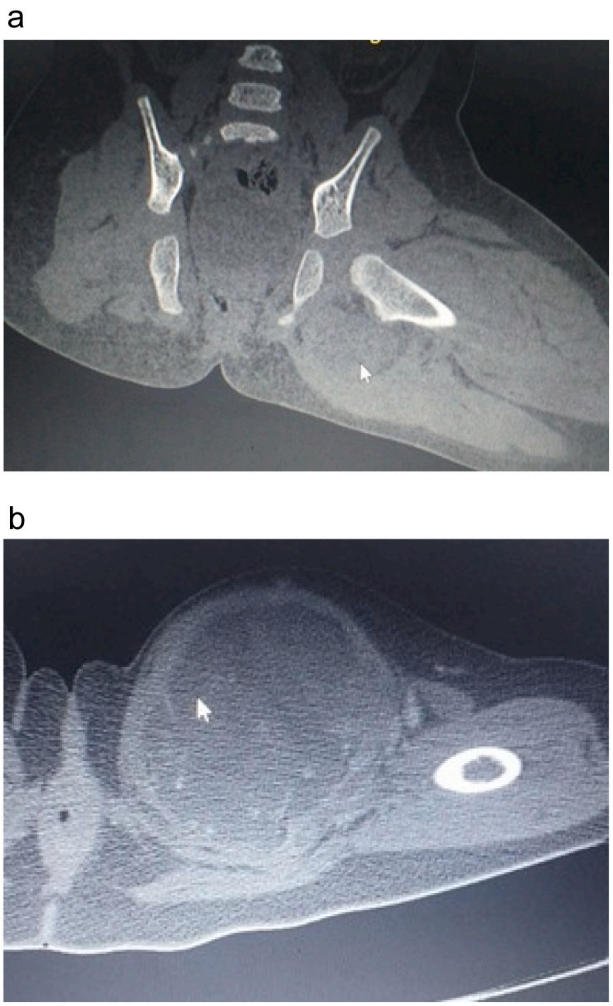

Fig. 2. a Showing preoperative CT scan of well circumscribed left anteromedial thigh mass.
b Showing preoperative CT scan of well circumscribed left anteromedial thigh mass.

of her left medial thigh over the past six months. The mass had been growing painlessly, without any history of trauma or infection. Upon physical examination, a firm, painless, non-pulsatile mass measuring approximately 10 cm was noted in the proximal thigh, fixed to the underlying tissues yet movable relative to the overlying skin. (Fig. 1a & b) There were no signs of inflammation, neurovascular impairment, or inguinal adenopathy.

A CT scan revealed a well-defined, hypodense lobulated mass in the left anteromedial compartment of the proximal thigh, extending to the inguinal area. The mass exhibited internal septation with a density comparable to subcutaneous fat, displacing the common and superficial femoral vessels anterolaterally without signs of invasion. The mass also abuts proximal femoral bone but no lytic or sclerotic lesion seen (Fig. 2a & b). An MRI confirmed the presence of a fatty-appearing mass with similar characteristics, showing no encasement of femoral vessels (Fig. 3).

The patient underwent surgical excision of the mass through a left anteromedial thigh incision, with careful preservation of the femoral vessels and nerves. The mass measured approximately 7 by 6 cm and weighed 650 g. It was well-encapsulated, soft, and yellowish-white (Fig. 4). Complete resection was achieved, and the surgical wound was closed in layers with a drain placed for 48 h.

Histopathological examination revealed a tumor composed of mature fat, myxoid changes, and lipoblasts among adipocytes. The

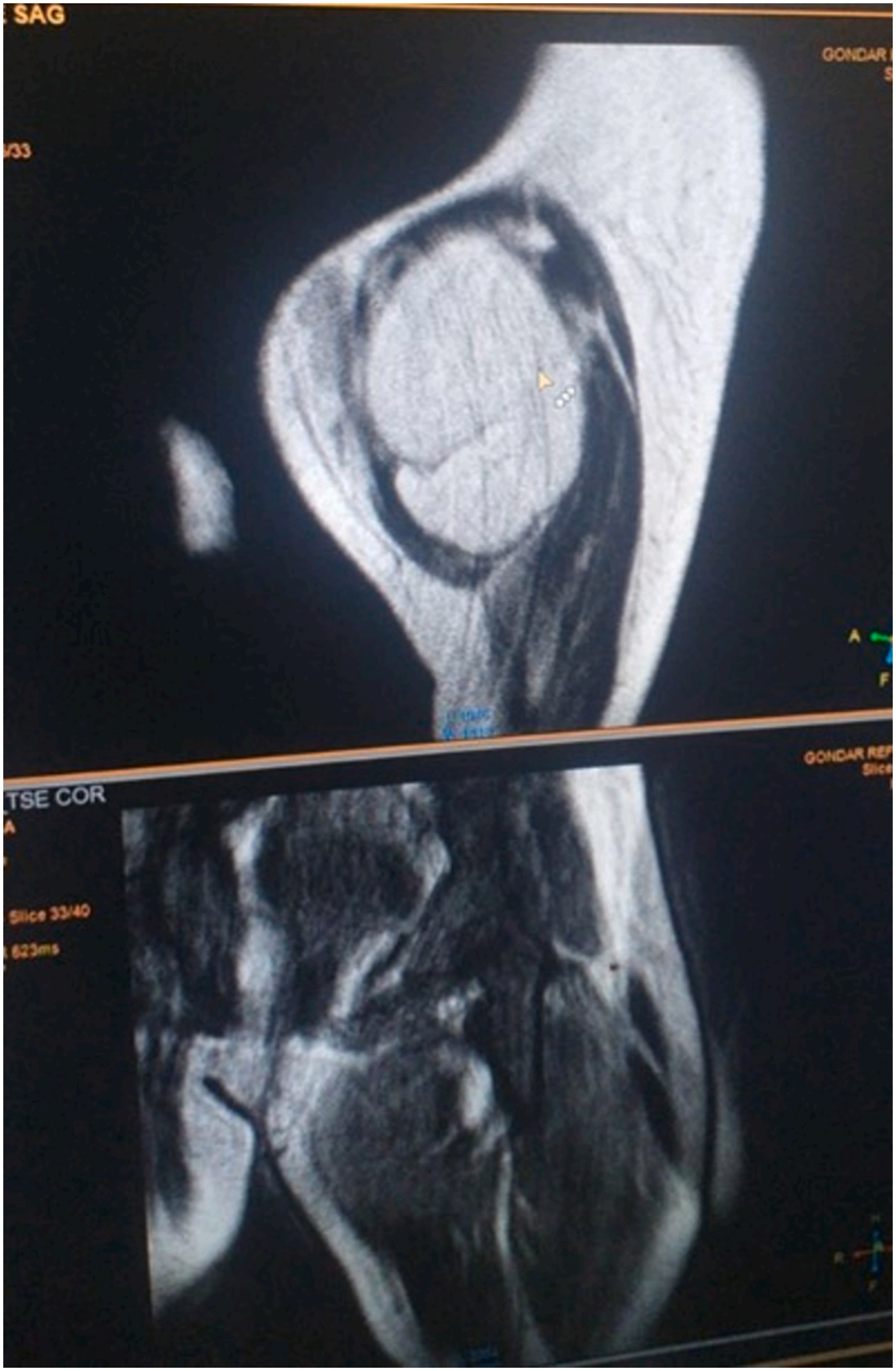

Fig. 3. Left thigh MRI showing huge mass with typical fatty appearance which is suggestive of Lipoblastoma.

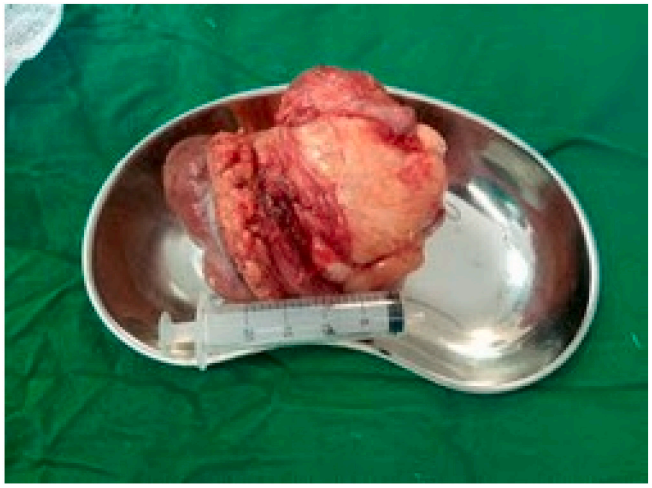

Fig. 4. Shows surgically excised mass.

center of the lesion displayed numerous myxoid changes, plexiform capillary channels, and mature adipocyte differentiation (Fig. 5a-d).

The patient had an uneventful recovery and was discharged in good condition. At the one-year follow-up, there were no signs of recurrence as shown in the following figure (Fig. 6).

4. Discussion

Lipoblastoma is a rare tumor that arises from embryonic white fat, primarily affecting infants and young children. It is characterized histologically by immature adipocytes, defined septa, numerous lipoblasts, and a fine vascular network. Clinically, lipoblastomas typically present as painless subcutaneous soft tissue masses that progressively grow which may mature into lipomas [4]. Symptoms are often related to the lesion's location, size, and mass effect. The extremities and trunk are the most common locations for these tumors, while the head and neck region accounts for 10 % to 15 % of cases [3]. The pathophysiology of lipoblastoma is thought to result from genetic predisposition and alterations in human white fat embryogenesis. Anomalies on chromosome 8 have been linked to the development of lipoblastoma [4].

A critical aspect of diagnosing lipoblastoma is differentiating it from liposarcoma, particularly the myxoid type, which is a malignant tumor [6]. Although liposarcoma is uncommon in individuals younger than ten years old, pathologists may find it challenging to distinguish it from lipoblastoma due to histological similarities. Key indicators that suggest liposarcoma include the absence of lobulation, varied growth patterns, and elevated nuclear atypia [7].

In addition to liposarcoma, other important differential diagnoses for fat-containing tumors include lipoma, teratoma, dermoid cyst, hibernoma, and involuting hemangioma [2]. True lipomas typically share characteristics with subcutaneous fat, but a fat-rich lipoblastoma can mimic this appearance. The clinical history of progressive growth can help distinguish a fat-rich lipoblastoma from a lipoma. Teratomas and dermoid cysts often contain calcifications or cystic areas in addition to

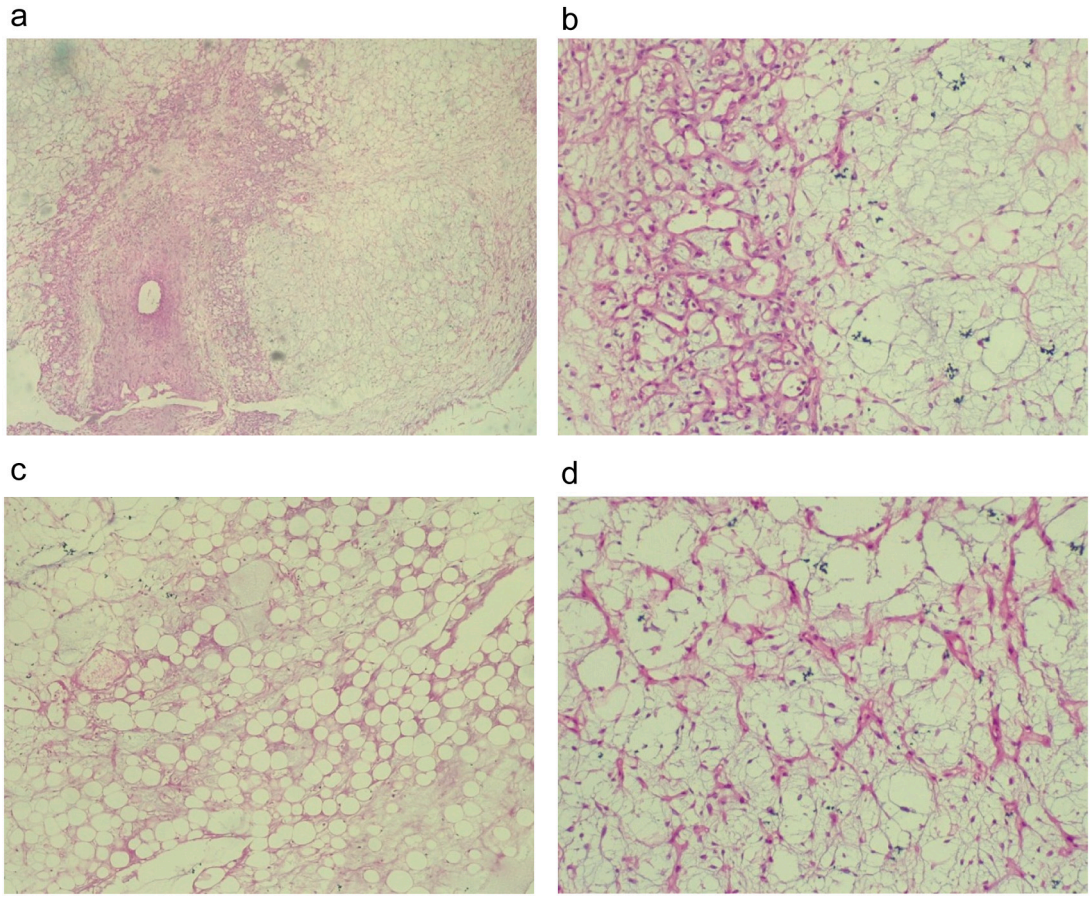

Fig. 5. a Lobulated architecture showing fibrous septa with lipoblasts at different stages of maturation.
b Myxoid areas are found more to periphery of the lobules with plexiform vessels.
c More mature adipocytes at the center of the lobules with admixture of lipoblasts and myxoid background towards the periphery.
d Plexiform vessels with myxoid areas towards periphery.

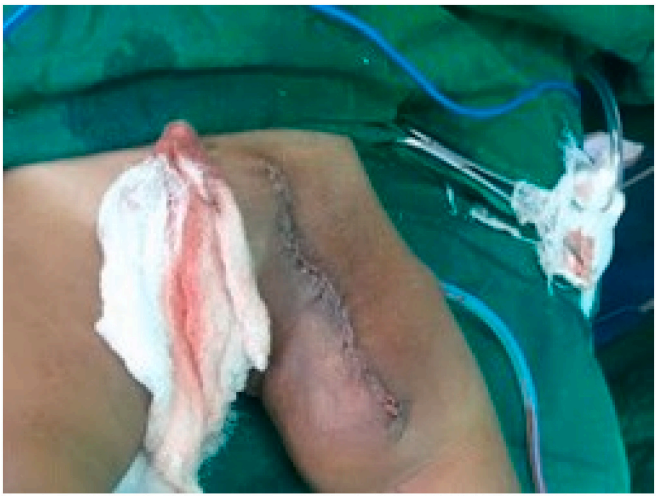

Fig. 6. Picture showing appearance of extremity after surgery.

fatty components [8]. Involuting hemangiomas exhibit a characteristic growth pattern marked by rapid proliferation during the first few months of life, followed by stabilization around 9 to 10 months, and a gradual involution phase that continues over several years, ultimately resulting in replacement by fibrofatty tissue by around 7 to 10 years of age [9]. Hibernomas typically occur in individuals in their 30s to 40s and are characterized by unique vascular structures [8].

Imaging studies, particularly CT and MRI, play a crucial role in presumptive diagnosis by revealing the tumor's characteristics, origin, composition, and anatomical extent, which aids in surgical planning [10].

The prognosis for lipoblastoma is generally excellent, with a recurrence rate of less than 25 %. Most recurrence cases are attributed to incomplete resection of large lesions or muscle infiltration. Recurrence is notably higher in lipoblastomatosis [11].

Given the limited literature on this rare condition, we hope this case provides valuable insights and encourages consideration of lipoblastoma in the differential diagnosis for painless masses in young children. In addition to emphasizing the importance of complete surgical resection, we highlight the need for ongoing monitoring for recurrence to ensure the best possible outcomes.

Author contribution

All authors contributed to the conception, writing and editing of the case report. All authors are agreed to be accountable for all aspects of it.

Consent

Written informed consent was obtained from the patient's parents/legal guardian 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

According to our institution, ethical clearance is not required for case reports.

Guarantor

Sileshi Serebe Zeleke.

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Conflict of interest statement

The authors declare that they have no competing interests.

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Not applicable.

Data availability

The authors of this manuscript are willing to provide any additional information regarding the case report.

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