

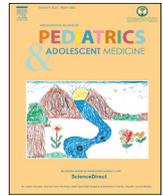
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## Imaging features of Lipoblastoma

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## ABSTRACT

Lipoblastoma is a rare benign soft tissue tumor found in infants and young children. It presents as an enlarging mass commonly observed in extremities, trunk, head and neck regions. Imaging features include a hyper-echoic mass on ultrasound, heterogenous fat density lesion on CT scan with enhancing septations and no calcification, and high T1 signal mass that drops the signal intensity on fat suppression MRI images. Total excision of such lesion is the treatment of choice, and follow-up is recommended to rule out recurrence.

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## 1. Introduction

Lipoblastoma is a rare benign tumor of infant and young children. It presents as rapidly enlarging painless mass with characteristic imaging features that limit the differential diagnosis [1].

## 1.1. Case report

A 5-month-old female infant presented with three weeks history of right sided neck swelling; there was no significant previous medical or surgical history. The mass was initially small in size that rapidly progressed during the two weeks before presentation. No histories of pain, fever or prominent neck vessels were not diagnosed during the presentation. Clinically, the right neck swelling was smooth, soft, mobile and non-tender. No pulsation was present or felt over the swelling and no bruits were heard on auscultation.

There was no restriction in the neck movement or shoulder joint. All blood investigations were normal. Soft tissue ultrasound exhibited a well-defined hyper-echoic neck mass extending to the right axilla (Fig. 1). Computed tomography (CT) scan of neck and chest and magnetic resonance imaging (MRI) demonstrated the fatty nature of the mass and its extension (Fig. 2). The lesion was a well-encapsulated heterogeneous mass that extended from the C3 vertebral level to the upper right axillary region (lateral to right lateral 3rd rib) deep to the right scapula and subscapularis muscle. It measured 7 × 5 × 4 cm in three dimensions (CC x VT x AP). It contained internal areas of fat that were suppressed on fat saturation images on MRI. There were internal solid components that enhanced after intravenous contrast administration (Fig. 3). Because of the patient's age and aforementioned findings, lipoblastoma was the likely diagnosis. Ultrasound guided biopsy was performed and the mass was consistent with lipoblastoma on

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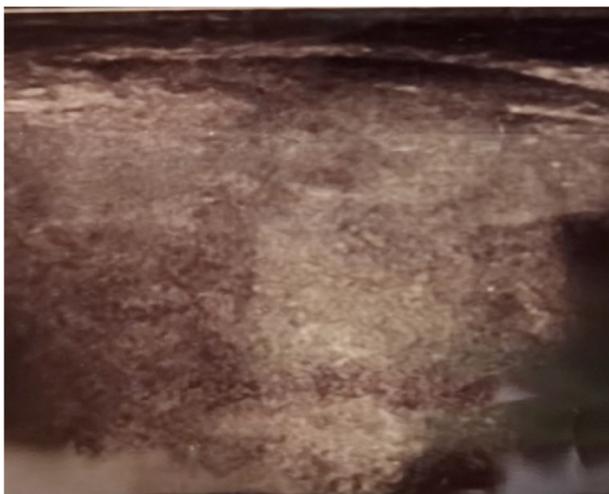


Fig. 1. Ultrasound of neck shows hyperechoic mass.

histopathology examination. Complete surgical resection of the mass was performed. The histopathology showed encapsulated neoplasm composed of lobules, containing nests of lipoblasts having bland oval nuclei, some of which are indented by the plenty vacuolated cytoplasm. There is no evidence of atypia, mitosis or necrosis (Fig. 4). The child was discharged in good health and follow up visits were unremarkable for 18 months following the discharge.

## 2. Discussion

Lipoblastoma is a very rare tumor found during infancy and in young children less than 3 years [1] that presents as a soft, rapidly enlarging, painless mass [1,2]. The lesion is commonly observed in the trunk, extremities, head and neck region [3]. Although it may exhibit local aggression, it has a benign nature and presents either as an encapsulated or infiltrative lesion; the former is known as lipoblastoma and the latter is lipoblastomatosis [2,4]. Ultrasound is the fastest and safest modality to evaluate any mass in children. As observed in this infant, it presented as a homogenous hyperechoic mass that insinuated between the structures with no significant mass effect. CT scan with intravenous contrast demonstrated heterogeneous fat density lesion with enhancing septations [4]. On MRI, the mass was hyperintense on T1 and T2-weighted images with internal areas that presented the loss of signal on T1-fat saturation images. After gadolinium administration, there were enhanced septations and few internal solid components. Histopathology images revealed a lobulated and capsulated lesion with lipoblast cells sheet separated by a fibrovascular stroma. The differential diagnosis for fat-containing mass in a child includes lipoblastoma, lipoma, teratoma and liposarcoma. Lipoma is very rare in young children and was excluded in this patient because of the presence of a non-fatty component. Calcification, ossification or other germ cell tissue was not observed in this mass, which rule out being teratoma. It is difficult to differentiate lipoblastoma from liposarcoma, however liposarcoma is very rare in children less than

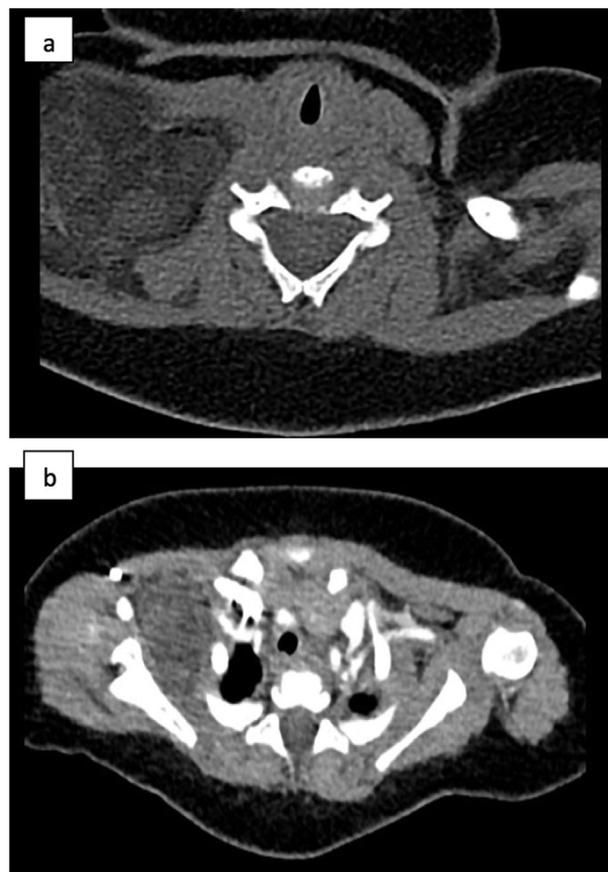
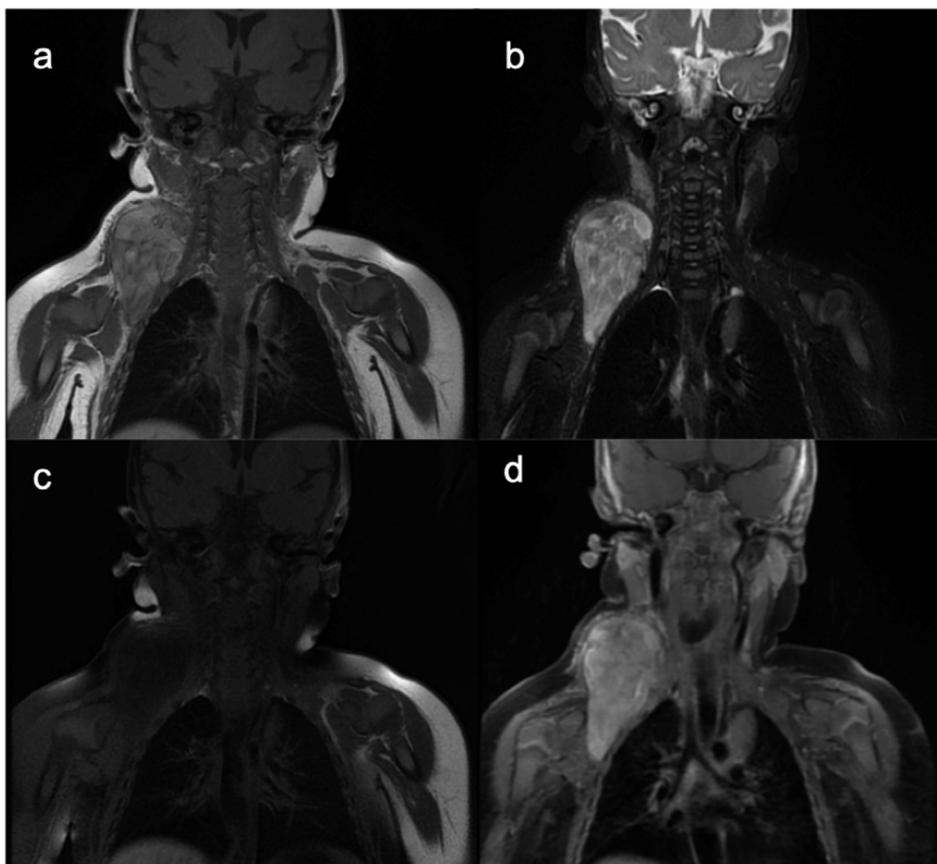


Fig. 2. CT scan of neck and upper chest ( 2a plain scan and 2b is post contrast image) show fatty mass in plain scan that enhance in post contrast image.

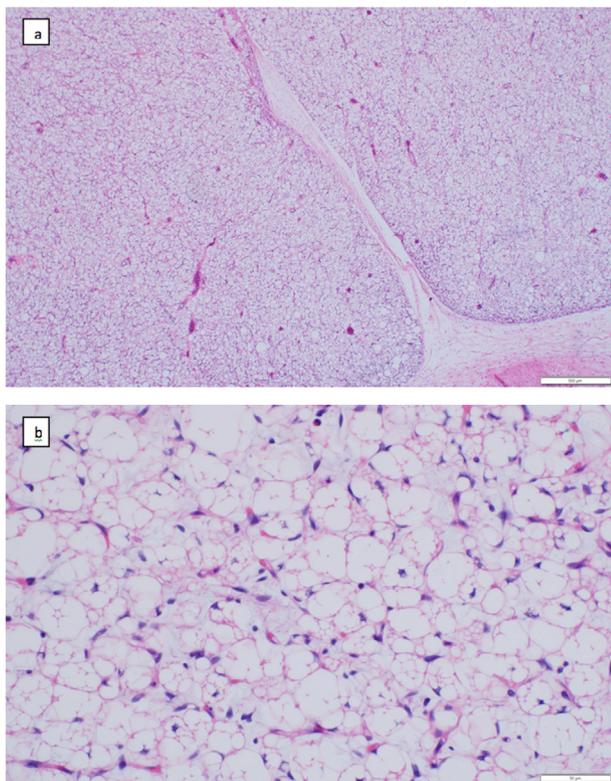
10 yrs [2]. The presence of soft tissue components in the lipomatous lesion in a child who is less than 3 years of age suggestive of lipoblastoma [3,4]. Another important differential diagnosis for a soft tissue mass in this age group is rhabdomyosarcoma which is very common in childhood and manifest as progressively enlarging soft tissue mass in the head, neck and extremity [4,5]. However, the presence of fat excluded this possibility in our patient. The MRI signal intensity of the fat component in lipoblastoma depends on the amount of mature adipose tissue observed in histopathology [3]. Radical tumor excision is required; otherwise the recurrence rate can be as high as 20% [1,2,6] which necessitates a long-term follow-up [5,7].

## 3. Conclusion

Lipoblastoma, though benign, shows a progressive increase in size, and features that point to diagnosis include age less than 3 years, soft mass insinuating between structures without invasion, and fat-containing lesion in imaging with enhancing soft tissue components.



**Fig. 3.** MRI images ( 3a coronal T1WI, 3b Coronal T2WI with fat saturation (FS), 3c Coronal T1WI FS pre contrast and 3 d post contrast T1WI with FS) demonstrate high signal intensity of the neck mass on T1WI ( a) and T2WI (b), that suppressed signal on fat saturation images ( b, c and d) and shows heterogeneous enhancement (d).



**Fig. 4.** Histopathology images, 4 a shows encapsulated lobulated tumor composed of lipoblasts separated by fibrovascular stroma, and 4 b high power magnification of tumor showing lipoblasts.

**Ethical statement**

No conflicts of interest.

**Author statement**

Farida Ambusaidi: Writing – original draft, Writing manuscript, Preparing literature review, Send the case for publication, Latifa Almaamari, Writing – review & editing, Preparing history and clinical examination, Review the manuscript, Ruqiya Al-Shamsi, Preparing histopathology slides, Review the manuscript, Writing – review & editing, Yahya ALBarashi, Preparing MRI images, Review the manuscript, Writing – review & editing

**Declaeration of competing interest**

None.

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