Lipoblastoma: An unusual cause of foot lump in children

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ABSTRACT
Bone and soft tissue tumors of the feet are uncommon. Lipoblastoma is a rare benign soft tissue tumor, almost exclusive to the pediatric population, with a predilection for males. Lipoblastomas most commonly occur in extremities, but rarely affect the foot. We present a case of lipoblastoma occurring in the foot of a 13-month-old boy and our literature review.
Key words: Lipoblastoma; foot; children; surgery.
Level of Evidence: IV

Lipoblastoma: una causa inusual de tumoración en el pie, en niños

RESUMEN
Los tumores óseos y de partes blandas localizados en el pie son muy poco frecuentes. El lipoblastoma es una neoplasia benigna de partes blandas rara que se presenta exclusivamente en la población pediátrica, con predilección por el sexo masculino. Su asiento preferente son las extremidades, pero raramente afecta el pie. Presentamos un caso de lipoblastoma de pie en un niño de 13 meses de edad y una revisión de la bibliografía.
Palabras clave: Lipoblastoma; pie; niños; cirugía.
Nivel de Evidencia: IV

INTRODUCTION

Bone and soft tissue tumors of the feet are uncommon, of which bone tumors are even rarer.[1-4] Multiple benign and malignant soft tissue lesions may affect this location, including ganglions, lipomas, villonodular synovitis, foreign body reactions, fibrolipomas, and soft tissue sarcoma.[5,6] Lipoblastoma is a benign tumor composed of adipocytes in different stages of maturation, which are immersed in a myxoid stroma and separated by connective tissue septa, without atypia. Lipoblastomas are very rare, almost exclusive to the pediatric population, and have a predilection for males (80%).[7] Although they may occur in different body regions, their most common location is the extremities.[8,9] This lesion usually affects regions with a great amount of adipose tissue, thus rarely affecting the dorsum of the foot, where the adipose tissue is limited.

The aim of this study is to present a lipoblastoma case with an atypical location (dorsum of the foot) in a pediatric patient, and our literature review.

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CLINICAL CASE REPORT

A 13-month-old boy with no significant personal or family history, whose mother reported a lump in the dorsum of the left foot. At physical examination, the mass was self-apparent, palpable, of significant size, without toe involvement, superficial, circumscribed, of a soft consistency and asymptomatic (Figure 1).

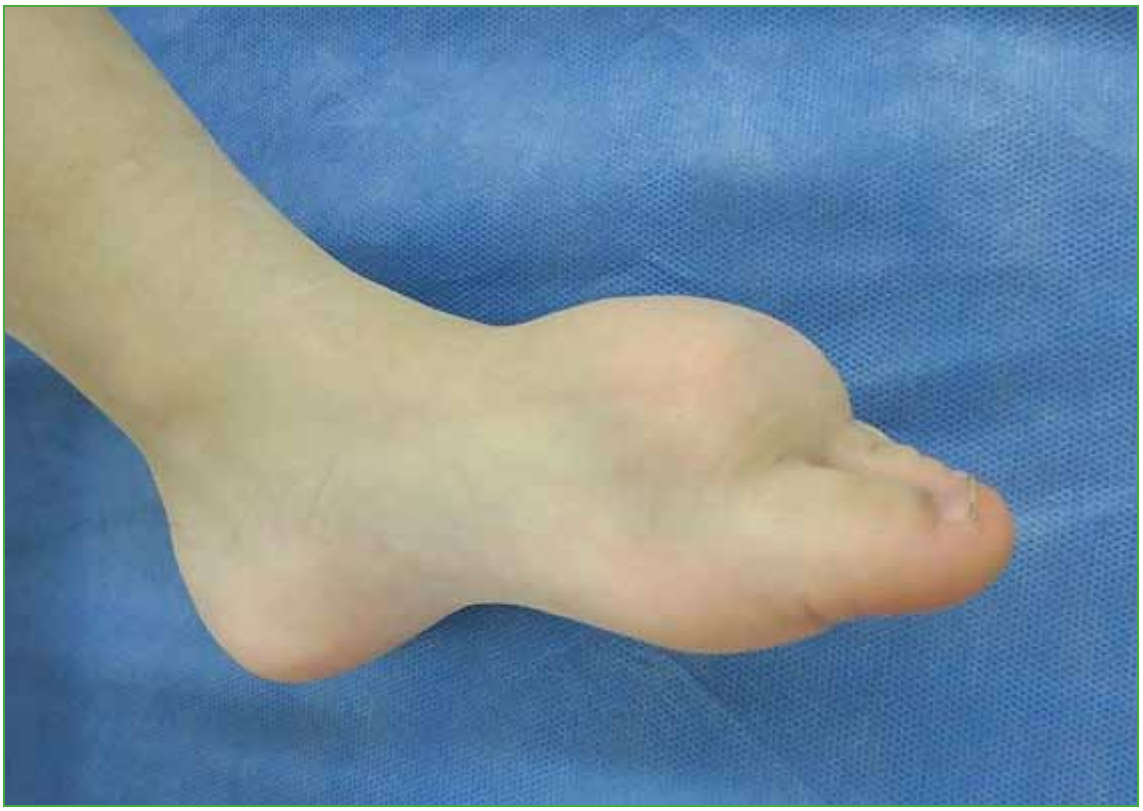

Figure 1. Clinical view of the lesion.

The deformity was noticed a few days after birth and it progressively enlarged with the child's normal growth. The MRI showed a massive expansion process, with clear and well-defined margins, located in the distal third of the foot dorsal aspect, proximal to the metatarsophalangeal joint. Signal was hyperintense and heterogeneous on Fat-Sat, T1- and T2-weighted sequences. MRI showed enhancement with peripheral predominance following the contrast material injection, and the approximated size was 51.7 mm of longitudinal diameter, 23.3 mm of AP diameter, and 39 mm of transverse diameter (Figure 2).

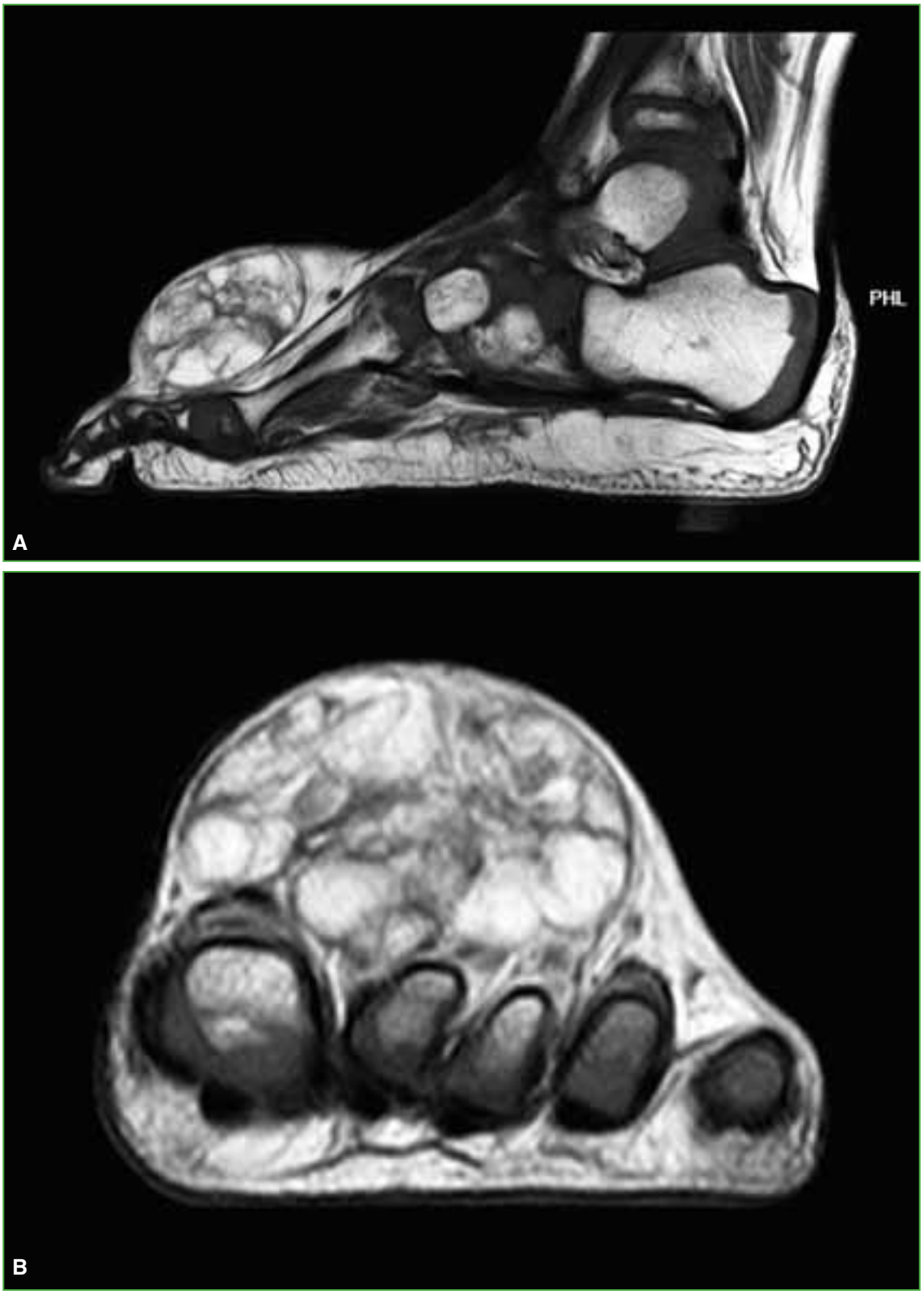

Figure 2. T1 MRI sequence. **A**. Sagittal section. **B.** Frontal section.

An excisional biopsy through a posterior approach was performed (Figure 3). There were no complications during the surgery or in the postoperative period.

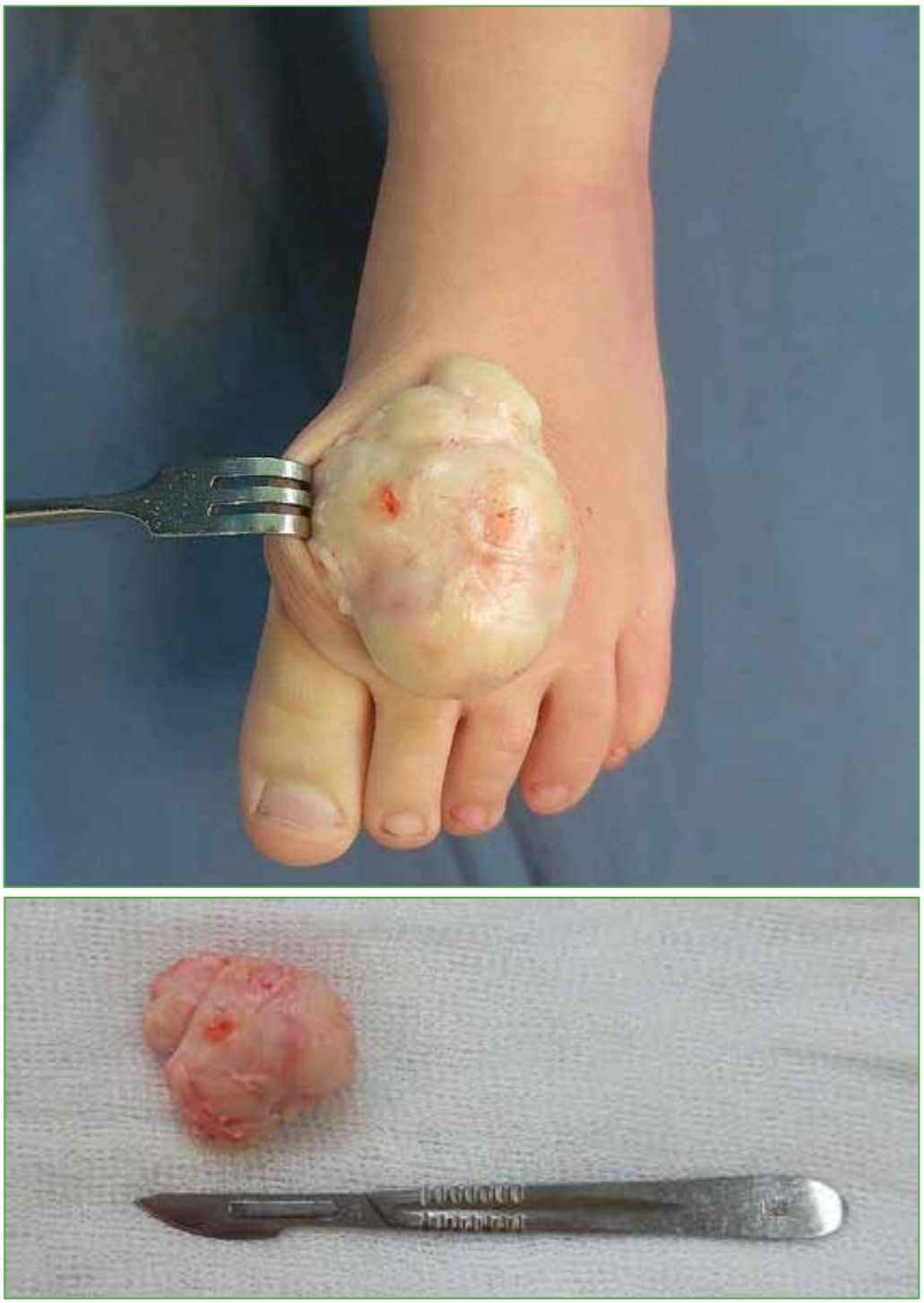

Figure 3. Macroscopic view of the lesion.

Pathology examination confirmed the definitive diagnosis of lipoblastoma (Figure 4). Postoperative course was satisfactory, without recurrence nor pain at 1 year after removal (Figure 5).

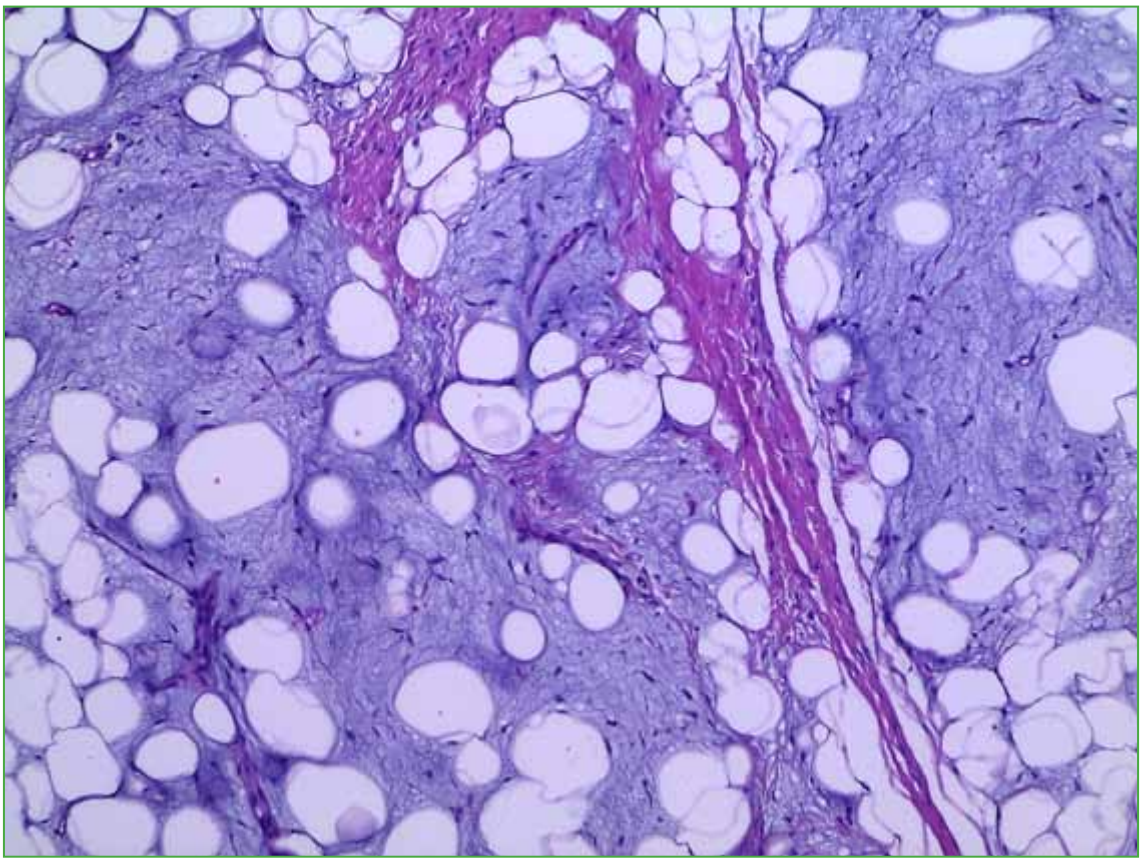

Figure 4. Anatomical pathology. Histologic examination showing a plexiform vascular pattern and abundant myxoid stroma divided by prominent fibrous septa into lobules of adipocytes in different stages of maturation, compatible with lipoblastoma.

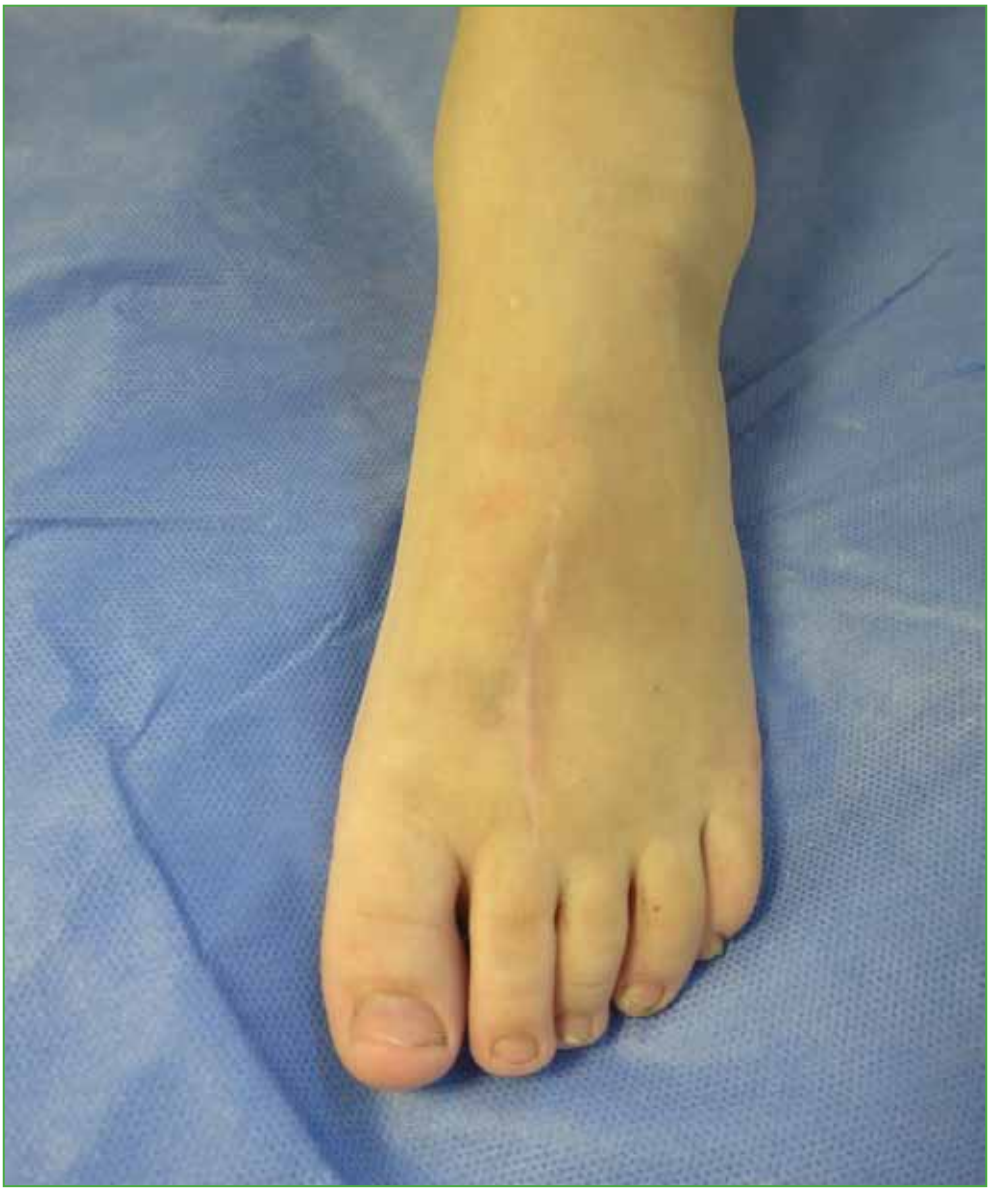

Figure 5. Clinical view at 1-year follow-up.

DISCUSSION

Lipoblastoma is a benign tumor composed of adipocytes in different stages of maturation, which are immersed in a myxoid stroma and separated by connective tissue septa of variable thickness.[10] The condition involves no atypical cells and a slow pattern of growth. The term "lipoblastoma" was coined by Jaffe in 1926.[11] They are rare tumors, which may affect children younger than 3 years of age and have shown a predominance in boys.[12] Lipoblastomas are usually asymptomatic, superficial, and localized in the extremities,[13] although they may be found in other areas, including mediastinum, head, neck, trunk, retroperitoneum, mesentery, groin and scrotum.[14] In our literature review, we found 12 published papers (13 patients) on lipoblastomas of the foot (Table). These cases have an average presentation age slightly higher than the ones reported on other locations (5.4 years) and only 5 out of the 13 reported cases were of patients younger than 3 years of age. The most common locations were the sole of the foot and the toes (regions with more adipose tissue), and only 1 patient had the lesion in the dorsum of the foot, as in our case. There are two types of lipoblastomas: 1) the circumscribed type, which is superficial and

Table. Literature review on patients with lipoblastoma of the foot

Authors	Patients	Age	Sex	Type of lesion	Location	Treatment	Recurrence	Follow-up
Syed *et al.* (2007)[6]	1	2 years	M	Lipoblastoma	Plantar region	Surgical removal	Not reported	Not reported
Gilbert *et al.* (1996)[7]	1	14 years	M	Lipoblastoma	Plantar region	Surgical removal	Not reported	Not reported
Pirela-Cruz *et al.* (1992)[10]	1	7 years	M	Lipoblastoma	Toe	Surgical removal	No	23 months
Gupta *et al.* (2005)[13]	1	6 years	F	Lipoblastoma	Plantar region	Surgical removal	Not reported	Not reported
Miller *et al.* (1997)[15]	1	9 years	M	Lipoblastoma	Foot	Surgical removal	Not reported	Not reported
Papendieck *et al.* (2003)[16]	1	1 month	F	Lipoblastomatosis	Plantar region	Surgical removal	Yes	3 years
Kocaoglu *et al.* (2005)[17]	1	5 years	M	Lipoblastomatosis	Plantar region	Surgical removal	No	2 years
Jung *et al.* (2005)[18]	1	6 years	M	Lipoblastoma	Foot	Surgical removal	Not reported	11 months
Mohta *et al.* (2006)[19]	1	8 months	M	Lipoblastoma	Dorsum of the foot	Surgical removal	Not reported	Not reported
Chien *et al.* (2006)[20]	1	1 year	F	Lipoblastoma	Heel	Surgical removal	No	Not reported
Giraldo Mordecay *et al.* (2017)[21]	1	5 months	M	Lipoblastoma	Toe	Surgical removal	No	6 months
Ghafar *et al.* (2018)[12]	2	6 years	M	Lipoblastoma	Foot	Surgical removal	Not reported	Not reported
		12 years	F	Lipoblastoma	Heel	Surgical removal	Not reported	Not reported

may simulate a lipoma; 2) the other is deeper with an infiltrative growth pattern and a greater tendency to reoccur (lipoblastomatosis).[16,20,22-24] Lipoblastomas as a presenting feature are more common than lipoblastomatosis when located in the foot.

The diagnosis must be based on physical examination and imaging tests. Although ultrasound examination is useful for small and superficial lesions, its use is limited for this condition, revealing a mass of mixed echogenicity and lobulated pattern. MRI is the imaging test of choice for larger and deep soft tissue tumor masses of larger size. Lipoblastoma MRI reveals a lobulated architecture, the presence of adipose tissue, thin septa, peripheral lobules of more immature and a peripheral pseudocapsule.[7,25] MRI is especially useful in the evaluation prior to reconstructive surgery or re-excision of recurrent lesions.[17] The definitive diagnosis must be established through histopathology testing. The differential diagnosis should consider other benign lesions (such as lipoma, ganglions, villonodular synovitis, foreign body reactions, fibrolipomas, and spindle cell lipoma) as well as malignant lesions (such as myxoid liposarcoma, liposarcoma, rhabdomyosarcoma, and desmoid tumor), which may have a similar presentation.[5,6,25]

The definitive treatment is the complete excision with wide margins. Several authors[7,9,12-14,20,22,26] suggest a strict follow-up. Although this lesion lacks metastatic potential, local recurrence rates of between 14% and 25% have been reported,[7,16,26] which are more common in lipoblastomatosis. Some authors indicate that local recurrences are highly unlikely to occur after the first year,[7] although there are recurrence reports as late as 3 years after surgery in infiltrated lesions.[9,16]

CONCLUSIONS

Lipoblastoma is a very rare soft-tissue tumor of mesenchymal origin and benign nature, almost exclusive to the pediatric population. Histopathology testing should be performed to rule out other pediatric lipomatous tumors, both benign and malignant. Lipoblastoma treatment is the complete surgical removal. As recurrence is possible, follow-up should be strict.

Conflict of interests: Authors claim they do not have any conflict of interest.

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