Lipoblastoma in an Infant's Foot

Guy Vogel MD[1], Abraham Ganel MD[2] and Moshe Salai MD[1]

[1]Department of Orthopedics and [2]Unit of Pediatric Orthopedics, Sheba Medical Center, Tel-Hashomer, Israel

Key words: lipoblastoma, lipoblastomatosis, foot, infant

IMAJ 2001;3:540–541

Lipoblastoma is an uncommon tumor of fat occurring primarily in infants and young children, most often in the extremities. We report our experience with this condition in an infant.

Patient Description

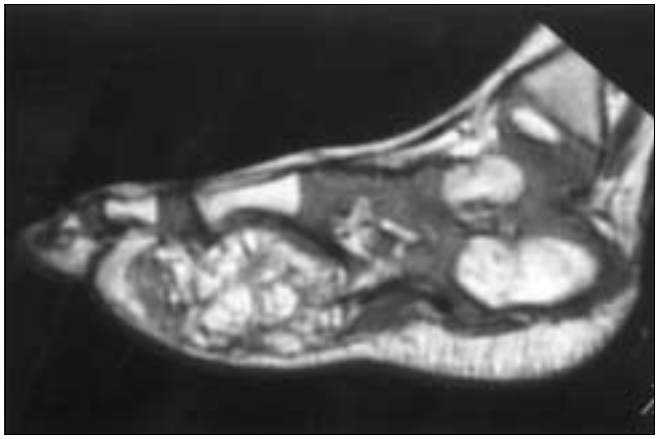
A 3 month old boy was admitted with a subcutaneous nodule at the plantar aspect of the base of the first left toe. The parents noticed that the size of the mass had increased since birth. No other symptoms were noted. Physical examination revealed a non-tender nodule measuring 4x4x4 cm. Radiological examination did not show osseous involvement. Fine-needle aspiration demonstrated a mesenchymal structure composed of young fibroblasts. When the child was 5 months old an open excisional biopsy was performed. Gross examination showed two separate masses: 4x4x4 cm and 2.5x2.5x2.5 cm. Microscopic examination revealed a lobular tumor divided by fibrous septa, and lobules comprising fat cells in different stages of differentiation. The final diagnosis was benign lipoblastoma.

At age 1 year 5 months the child's tumor recurred. Magnetic resonance imaging of the left foot was performed under general anesthesia. The MRI revealed a sharply demarcated 4.5x3.5x3 cm subcutaneous mass on the medial and distal aspect of the forefoot that was interpreted as a tumor with benign lipoid structure with no involvement of the surrounding bone [Figure A]. Clinically the child was asymptomatic; we therefore elected to observe the child and delay further surgery since there was no bony involvement and the size of the tumor remained unchanged.

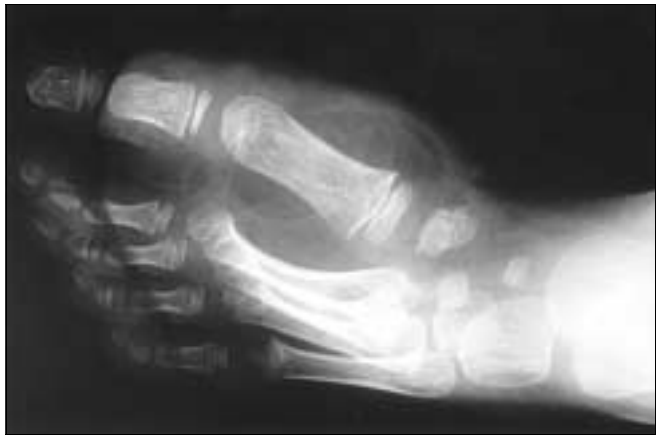
When the boy was 5 years old the first web space became slightly wider. X-ray radiographs a year later showed that the tumor had grown [Figure B]. The first web had become wider and disturbed the child. He began to walk on the lateral aspect of the foot and had difficulty putting his shoes on. A second MRI of the left foot revealed a 4.8x3.9x4.9 cm mass with no other differences compared to the former MRI performed 4 years earlier. At the age of 6 years, re-excision of the soft tissue tumor was performed, revealing a tumor measuring 5x5x8 cm. No bone was resected. Histological examination confirmed the diagnosis of benign lipoblastoma with free surgical margins. The child resumed full activity with no evidence of recurrence at follow-up of one year.

Comment

Lipoblastoma is an uncommon mesenchymal tumor of fat that occurs primarily in infants and young children under 8 years old. Most of the cases (88%) are diagnosed before the age of 3 years, with >55% diagnosed before the first year of life. There is a male predominance of between 1.5 and 3:1. About 70% of these tumors occur in the extremities. Although several other sites have been described, e.g., the mediasti-



A. High resolution MRI T1-weighted post-Gd-DTPA sequences in sagittal view in an infant aged 1 year 5 months, showing 4.5x3.5x3 cm subcutaneous mass over the plantar aspect of the foot.



B. Plain radiograph at age 6 years demonstrates the recurrence of the tumor with no osseous involvement.

num [1] and buttock [2], occurrence in the plantar aspect of the forefoot is extremely rare.

The term lipoblastoma was first used by Jaffe in 1926. The term lipoblastomatosis was introduced in 1958 by Vellios to diagnose an infiltrating tumor composed of fetal fat. In 1973 Chung and Enzinger recognized a circumscribed form of the tumor that they designated benign lipobastoma [3].

Lipoblastoma, in contrast to lipoblastmatosis, is usually encapsulated and superficial and has a lower tendency to recur when incompletely excised. Despite its potential to invade locally and a certain potential to grow rapidly to a large size, both tumors have an excellent prognosis. The recurrence rate in both types is 14–25% and is usually correlated to the diffuse-type lesions (lipoblastomatosis) and to incomplete excision. Metastases do not occur [2]. It is conceivable that if a lipoblastoma is followed long enough the tumor will eventually be seen to differentiate into a mature lipoma [3]. Plain radiographs and MRI scans are the main modalities for evaluating patients with soft tissue masses like lipoblastoma [4]. We also use ultrasonography to distinguish it from a granuloma or a foreign body. The histomorphological patterns in lipoblastoma and lipoblastomatosis are identical. These lesions differ from lipoma or lipomatosis by their cellular immaturity. They show close resemblance to low grade liposarcoma, especially the mixoid variant type. Lipoblastoma can be differentiated by its more uniform growth pattern and more striking lobulation. The lipoblast, which may exist also in lipoblastoma, shows no nuclear atypia or pleomorphism in contrast to that seen at least focally in liposarcoma. Some authors describe the lack of microcystic spaces, filled with mucin, as a hallmark of lipoblastoma/lipoblastomatosis [2]. Lipobastoma may exhibit clonal karyotipic changes [2]. These lesions have rearrangements affecting chromosome 8q. A breakpoint in chromosome 8q can differentiate lipoblastoma from lipoma and mixoid liposarcoma, which may have a breakpoint in chromosome 12 in different places [5].

We were able to find only one previous case report of a similar involvement. The case presented here is of a recurrent lipoblastma in childhood after excisional biopsy in infancy. Lipoblastoma should be added to the differential diagnosis of soft tissue tumors in infants' feet, and consist also of plantar fibromatosis and foreign body granuloma.

References

1. Fredrici S, Cuoghi D, Sciutti R. Benign mediastinal lipoblastoma in a 14-months-old infant. *Pediatr Radiol* 1992;22:150–1.
2. Mantel T, Calonje E, Fletcher CD. Lipoblastoma and lipoblastomatosis: a clinicopathological study of 14 cases. *Histopathology* 1993;23(6):527–33.
3. Mahour GH, Brayn BJ, Isaacs-H JR. Lipoblastoma and lipoblastomatosis – a report of six cases. *Surgery* 1988;104(3):577–9.
4. Franklin H. Soft tissue tumors [Editorial]. *Curr Orthop* 1997;11:73–4.
5. Collins MH, Chittin J. Lipoblastoma/Lipoblastomatosis: a clinicopathologic study of 25 tumors. *Am J Surg Pathol* 1997;21(10):1131–7.

Correspondence: Dr. G. Vogel, Dept. of Orthopedic Surgery A, Sheba Medical Center, Tel-Hashomer 52621, Israel. Phone: (972-3) 530-2623, Fax: (972-3) 530-2523, email: agv@zahav.net.il