CASE REPORT

Intramuscular lipoma of the abductor digiti minimi mimicking intramuscular haemangioma

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SUMMARY

Intramuscular lipoma of the foot is rarely reported. We reported a case of intramuscular lipoma of the abductor digiti minimi mimicking intramuscular haemangioma in clinical and MR findings.

BACKGROUND

Intramuscular lipoma is a deep-seated lipoma that arises in the muscle and is benign and relatively rare.¹ It is seen in adults in the striated muscles of the trunk, head and neck, and in the limbs. The diagnosis of an intramuscular lipoma is confirmed if an entirely adipose intramuscular lesion with few, fine (<2 mm), regular septae is found on MR examination. The MR findings varied from a small, single and homogeneous mass, identical to superficial lipoma, to a large, inhomogeneous lesion with an infiltrative margin.¹ Despite its benign nature, it can be misdiagnosed as a malignant tumour, especially a well-differentiated lipoma-like liposarcoma.²⁻³ Intramuscular lipomas of the pectoralis major muscle have been reported to mimic malignant breast tumours.⁴

Histologically, the fascicular organisation of the striated muscle is preserved. Between the striated muscle fibres, mature adipocytes are found which are regular in shape and size with no nuclear abnormalities.² There are two histological types: a well-circumscribed type and an infiltrative type. In the former, fatty tissue was clearly delineated from the surrounding muscle, whereas in the latter there was replacement of the muscle tissue in a bland fashion by lipocytes, while longitudinal sections demonstrated a striated appearance of muscle fibres caused by the proliferation of fat cells.¹

We reported a case of an infiltrative type intramuscular lipoma of the abductor digiti minimi, which was initially misdiagnosed as an intramuscular haemangioma.

CASE PRESENTATION

A 52-year-old woman had a left foot painless lump for 1 year before attending our clinic. There was no precipitating factor identified and the lump was increasing in size. There was no systemic upset or other similar mass over the other parts of her body. Clinical examination revealed a 1 cm lump at the lateral side of the cuboid. The lump was empty and refilled by pressure over the lateral border of the sole (video 1). The patient cannot abduct the little toe of both feet actively.

INVESTIGATIONS

A radiograph of her left foot was unremarkable. An MR examination showed serpiginous structures with T2 hyperintensity over a subcutaneous region near the base of the fifth metatarsal bone with extension into the abductor digiti minimi muscle and around the peroneus longus and brevis tendons suspicious of haemangioma (figure 1).

TREATMENT

Excision of the lump together with the abductor digiti minimi muscle was performed (figure 2). The specimen was sent for histological examination and sections showed skeletal muscle bundles with fat lobules seen intramuscularly (figure 3). The overall features were suggestive of an intramuscular lipoma. Owing to the mismatch of the radiological and histological diagnoses, the radiologist and pathologist were required to examine the MR films and specimen again. According to the radiologist, the well-defined lesion was essentially T1-weighted (T1W) hypointense, T2-weighted (T2W) hyperintense in signal and showed homogeneous vivid enhancement. It involved both the subcutaneous and intramuscular compartments without respecting the tissue planes. The radiological diagnosis was 'soft tissue haemangioma' or, more accurately, slow flow vascular malformation. No fatty component (ie, T1W hyperintense, similar to the signal of subcutaneous fat or fatty marrow) was identified in the lesion which may be present in a lipoma or in a haemangioma with internal fibrofatty stroma. According to the pathologist, immunostain has been performed to try to identify the abnormal vessels within the specimen. However, there was no definite feature showing that it was a vascular lesion.

OUTCOME AND FOLLOW-UP

Local recurrence of a lateral foot dorsal lump occurred 8 months after the operation. An MR examination with contrast was performed and it showed complete excision of the previous lesion in the subcutaneous region and abductor digiti minimi with a newly occurred lesion at the lateral aspect of the dorsum of the left foot. The lesion was T1 isointense and T2 hyperintense with wall and septal enhancement (figure 4). The patient refused further surgical intervention.

DISCUSSION

Intramuscular lipomas occur dominantly in the thigh. The quadriceps femoris is the most frequent site of involvement. The deltoid is the second most

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Figure 1 MR examination showed serpiginous structures with T2 hyperintensity over the subcutaneous region near the base of the fifth metatarsal bone with extension into the abductor digiti minimi muscle and around the peroneus longus and brevis tendons. According to those available pictures, the well-defined lesion is essentially T1W hypointense, T2W hyperintense in signal and shows homogeneous vivid enhancement. It involves both the subcutaneous and intramuscular compartments with no respect for tissue planes. (A) T2 coronal view; (B) T1 fat suppression coronal view; (C) T2 transverse view; (D) T2 sagittal view.

Figure 2 Excision of the lesion together with the abductor digiti minimi muscle. (A) The herniated part of the lesion (arrow) was seen in the subcutaneous plane. (B) The abductor digiti minimi muscle was excised together with the herniated lesion; (C) the specimen.

Figure 3 (A and B) Histological pictures with H&E stain. (A) Low-power histological picture of the specimen showed skeletal muscle fibres and adipose tissue which were closely associated with each other. (B) Medium-power histological picture showed the presence of fat lobules in between the skeletal muscle fibres. CD31 stain (C) and CD34 stain (D) of the specimen did not suggest a vascular tumour.

frequent site.⁵ Surgical excision is the best way to treat the symptomatic intramuscular, infiltrating lipoma.⁶ The recurrence rate of intramuscular lipoma is high with reported recurrence rates of 3–62.5%.⁵ Careful preoperative evaluation and complete tumour excision with clear margins are most important to ensure successful surgical results.⁶ In order to avoid recurrence, infiltrating muscular lipomas, although benign, should be treated by total excision of the muscle or by compartmental resection.^{7 8} To the best of our knowledge, no case of intramuscular lipoma in the foot has been reported previously in the English literature and the clinical course is not known.

The major differential diagnosis of an intramuscular lipoma in MR is lipoma-like well-differentiated liposarcoma. It can mimic deep-seated lipoma in radiological as well as histological findings, and they occasionally cause problems at the time of making a diagnosis and choosing the treatment.^{1 5} In this case, the lesion was initially diagnosed to be a haemangioma based on the clinical and MR findings. The rate of accurate prediction of intramuscular haemangioma using MRI is 90%.⁹ Most intramuscular haemangiomas show tissue characteristics of intermediate signal intensity on T1W and high-signal intensity on T2W images. These are characteristic but not pathognomonic. The presence of adipose tissue within large-vessel-type

Figure 4 MR examination with contrast was performed which showed complete excision of the previous lesion in the subcutaneous region and abductor digiti minimi with a newly occurred lesion at the lateral aspect of the dorsum of the left foot. The lesion was T1 isointense and T2 hyperintense with wall and septal enhancement.

Video 1 "emptying" and "refilling" signs of the lump.

haemangiomas is common, and at times may be as conspicuous as to suggest a lipoma.^{2–9} However, no fatty component can be found in the lesion in MR examination of this patient. Although there was a case report of lipoblastoma mimicking haemangioma,¹⁰ no case of intramuscular lipoma mimicking haemangioma has been reported previously. In the report of Perlis *et al*,¹⁰ the lesion was hypointense on T1 relative to subcutaneous fat. It was proposed to be due to the increased cellularity of lipoblastomas, as well as the presence of immature fat cells in lipoblastomas in contrast to mature fat cells in subcutaneous tissue. Histologically, the lesion had a very primitive lipoblastoma with a paucity of lipoblasts and a prominent network of vessels, which explained its misleading appearance on MR scan.¹⁰ However, it was not the case in our patient as no prominent network of vessels was found histologically. It is still a dilemma of the mismatch of MR and histological findings in this case.

The clinical presentation of an apparent emptying sign and refilling on compression at the plantar side in this case was initially regarded as a sign of haemangioma. On second thoughts, it may be a sign of an extramuscular component of the intramuscular lipoma.⁵ As the lipoma did not tend to invade the surrounding tissues, it protruded into the surrounding tissues and resulted in a dumb-bell-shaped tumour.⁵ The lump in this case may represent one end of the dumb-bell tumour while the other end was at the abductor digiti minimi muscle. The apparent emptying and refilling sign may represent the shift of the fatty tissue between the two ends of the dumb-bell tumour. The preoperative misdiagnosis of haemangioma may make the surgeon

misinterpret the extramuscular component of the tumour as normal fat tissue and was not resected. This made the excision margin unclear even the abductor digiti minimi muscle was resected together with the tumour and lead to early recurrence.

Learning points

- ▶ Intramuscular lipoma of the abductor digiti minimi can mimic intramuscular haemangioma.
- ▶ Excisional biopsy is needed to confirm the diagnosis.
- ▶ The preoperative misdiagnosis may make the surgeon misinterpret the extramuscular component of the tumour as normal fat tissue leading to early recurrence. This made the excision margin unclear even the abductor digiti minimi muscle was resected together with the tumour and lead to early recurrence.

Contributors THL was responsible for the initial idea, collection of the data and preparation of the manuscript.

Competing interests None.

Patient consent Obtained.

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