Hibernoma of the thigh: a report of four cases

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ABSTRACT

Hibernoma is a rare benign adipocyte tumour of brown fat. We report on 4 patients with hibernoma of the thigh. Clinical features and magnetic resonance imaging suggested the tumours were liposarcomas, but biopsy yielded the diagnosis of hibernoma. All 4 patients underwent complete excision of the tumour and had no recurrence.

Key words: lipoma; thigh

INTRODUCTION

Hibernoma (a type of lipoma) is a rare benign tumour of soft tissue. It develops in areas where brown fat persists and manifests as a slow-growing, painless mass. It is difficult to differentiate it from other types of lipoma and hypervascular lesions such as liposarcoma.

CASE REPORTS

Records of 3 women and one man aged 35 to 54 (mean, 46) years with hibernoma of the thigh treated in our hospital between 1994 and 2006 were reviewed (Table). The tumours were located in the posterior (n=1) and anteromedial (n=3) compartments and had existed for 6 to 14 years. The masses were 12 to 22 cm in diameter, firm, painless, non-pulsatile, movable on the surface but fixed to the muscle. The patients had normal C-reactive protein level and no inflammation. Sensorimotor control and all distal pulses were present. In one patient, the tumour expanded rapidly over 6 months and resulted in discomfort during walking and weight loss.

Radiography revealed no calcification. In one patient, computed tomography revealed the mass to be hyperintense and heterogeneous, with a zone of central necrosis and no bone abnormality (Fig. 1). In another patient, the mass was hypointense even after contrast enhancement (Fig. 1). In the other 2 patients, magnetic resonance imaging was isointense on T1-weighted images and hyperintense on T2-weighted
images, with fat saturation (Fig. 2). After injection of Gadolinium, there was diffuse contrast enhancement corresponding to the vascular branches (Fig. 2). All 4 patients underwent biopsy and the histological diagnosis was hibernoma in 2 and ‘lipoma-like’ in the other 2 (Fig. 3).

All patients underwent complete excision under local anaesthesia. In one patient, the tumour was hypervascular. At the last follow-up, no patient had recurrence or functional deficit.

**DISCUSSION**

In hibernating animals, brown fat plays an important role in temperature regulation and energy. Hibernoma develops from foetal brown fat. In adults, brown fat is mostly located in the shoulder region and neck. It can be encountered at any age, the peak being the third decade, and it shows a slight female predominance. Common sites of hibernoma are the shoulder, back, neck, thorax, arm, and abdomen.
Hibernomas usually grow slowly but can also grow rapidly, and sometimes cause pain when they compress adjacent structures. Some are warm to touch owing to their vascular nature. They may be associated with intense weight loss, owing to excessive thermogenesis via intense catabolism of carbohydrate and lipid in brown fat. Body weight returns to normal after their excision.

The diagnosis is difficult, and rarely by radiography. Ultrasonography reveals hibernomas to be uniformly hyperechogenic, whereas angiography shows highly vascularised tumours with occasional arteriovenous shunts. Technetium scintigraphy yields areas of increased uptake. Computed tomography shows the tumour density to be intermediate between muscle and fat, with possible heterogeneous enhancement after contrast enhancement, and the presence of intratumoral vessels. In addition, the tumour can be hypointense or slightly hyperintense compared to the subcutaneous fat. Magnetic resonance imaging enables making a specific diagnosis, using the signal characteristics of soft tissues. The masses can be hypointense or isointense on T1-weighted images or isointense or hypointense on T2-weighted images (relative to the fat). Fatty-suppressed sequences can reveal its vessels. The Gadolinium enhancement is particularly intense in areas of low signal. Signals vary depending on the cellular composition of each hibernoma. The differential diagnosis includes lipoma, angiolipoma, malignant fibrous histiocytoma, and liposarcoma. Thus, biopsy is necessary to confirm the diagnosis.

Percutaneous biopsy confers a haemorrhage risk due to their vascularity. The tumours are encapsulated by a fine translucent film and may adhere to fine trabecular muscle, making them difficult to excise. These adhesions should not be interpreted as features of malignancy.

The hibernomas are characterised by various levels of differentiation and a mixture of mature...
adipocytes cells, multivacuolar cells, and round cells, with a central pit and eosinophilic cytoplasm corresponding to the brown fat cells. Hibernomas can be classified into 4 histological variants: typical, spindle, lipoma-like, and myxoid. Cytogenetically, hibernomas are characterised by chromosomal aberrations with a reciprocal translocation involving 9q34 and 11q13 bands t (9;11) (q34; q13).21

As hibernomas are very vascular, maintaining haemostasis during surgical excision is important, and they do not degenerate.22

DISCLOSURE

No conflicts of interest were declared by the authors.

REFERENCES