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Case Report

Hibernoma of the thigh: a case report and literature review

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ABSTRACT

Hibernoma is a rare benign tumor of brown fat. It presents as a voluminous slow growing mass in the regions where remnants of brown fat can remain in adults. We report a case of a hibernoma on the thigh and present the diagnostic and therapeutic elements of this type of tumor, whose differential diagnosis of liposarcoma.

Keywords: Brown fat, Hibernoma, Thigh

INTRODUCTION

Hibernoma is a relatively rare benign lipomatous tumor, first described in 1906 by Merkel as "pseudo lipoma". Eight years later, following Gery's study which found similarity between tumor cells and normal brown adipose cells in hibernating animals and newborns, he named this type of tumor "hibernoma". Remnants of this fat can be found in adults in the scapular region, neck, and rarely in the thigh.[1,2]

The tumor is painless and often of significant size at the time of diagnosis, which poses differential diagnostic challenges with sarcomas. We report a case of hibernoma in the thigh, reviewing the specifics of this tumor.

CASE REPORT

A 67-year-old man with no notable medical history presented with a painless swelling at the root of the left thigh, which had been evolving for two years. The patient was apyretic and in good general condition. Clinical examination revealed a firm, non-pulsatile, mobile mass measuring 7 cm in length and 3 cm in width, located on the anteromedial aspect of the thigh. There were no downstream vascular or nerve disorders, no satellite adenopathies, and hip mobility was normal. Biological tests were normal.

X-rays of the pelvis and femur revealed no bone lesions, calcifications or soft-tissue ossifications. The patient then underwent magnetic resonance imaging (MRI) of the thigh, which showed a well-defined subcutaneous mass with lobulated margins in the anterior region of the thigh, measuring 7 cm long and 3 cm wide, with enhancement after gadolinium injection (Figure 1). Ultrasound-guided biopsy and histological examination confirmed the diagnosis of hibernoma.

Surgical excision under locoregional anaesthesia was performed via an anteromedial approach to the thigh, enabling complete removal of this greyish, encapsulated, non-haemorrhagic tumour.

Macroscopically, the tumour measured 7×3×2 cm, weighing 100 g. It was brown, encapsulated and crossed by a superficial venous network (Figure 2).

Histologically, the tumor consisted of lobules of variable size, delimited by highly vascularized fibrous septa. Cell proliferation consisted of large, spherical, polyhedral cells, riddled with fatty vacuoles. These cells had a rounded

central nucleus. In addition, there were numerous mature adipocytes (Figure 3). No cellular atypia was noted. This appearance was suggestive of a hibernoma. After 24 months' follow-up, the patient showed no signs of local recurrence.

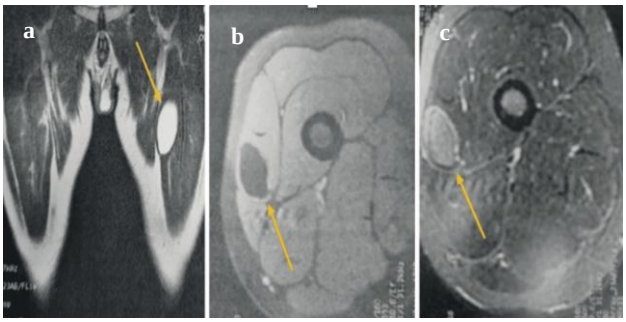

Figure 1 (a-c): MRI of the thigh, showing a well-defined subcutaneous mass with lobulated margins in the anterior thigh region, measuring 7 cm in length and 3 cm in width with enhancement after gadolinium injection.

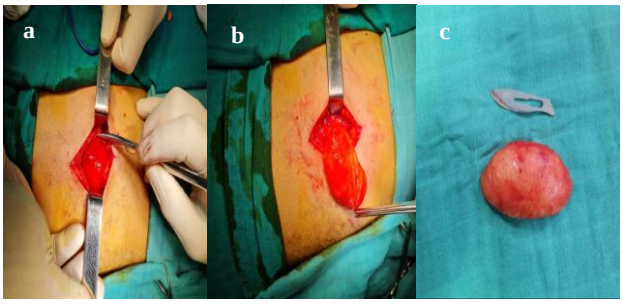

Figure 2 (a-c): Surgical excision under regional anesthesia via an antero-internal thigh approach.

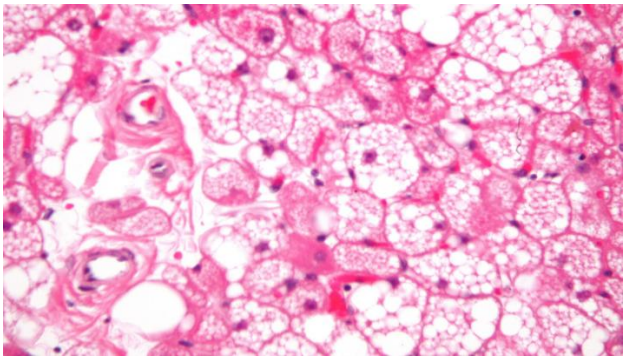

Figure 3: Histological appearance of hibernoma.

DISCUSSION

Lipomatous tumors are relatively common reasons for consultation, with a wide diagnostic range including lipomas, lipofibromas, angiolipomas, hibernomas, liposarcomas, etc. Hibernomas represent approximately 1.6% of all benign lipomatous tumors and about 1.1% of all adipose tissue-derived tumors. To date, malignant tumors of brown fat tissue have never been described, indicating that the pathophysiology of these tumors remains poorly understood.[3-5]

The gender predominance is controversial; some authors report a male predominance while others consider a female predominance.[6,7]

They most often affect young adults between 30 and 40 years. Previously, it was commonly accepted that hibernoma's site of predilection is areas where remnants of brown fat persist in adults, notably in the mediastinum, neck, and axillary region; however, several recent studies have shown other sites of localization, including the lower and upper limbs, with significant involvement such as thigh affecting 30% of cases.[6,8]

Clinical manifestation is usually as a superficial, soft, well-defined, painless, firm mass with slow growth. However, it can suddenly increase in size. As hibernoma is a hypervascularized mass, the overlying skin is often warm. It has an average diameter of 5 to 10 cm but can reach up to 18 cm in the largest dimension. In the thigh, the mass may be associated with walking discomfort, pain, tingling, heaviness, or fatigue of the lower limb.[9-13]

On standard radiographs, hibernomas are often non-apparent or may sometimes be detected as a mass of increased density or fatty opacity. Radiographs often show a mass with radiolucency compatible with adipocytic tumor, or some increased soft tissue density, without bone involvement.

Ultrasound shows a hyperechoic mass, and Doppler examination may identify several large vascular channels within the mass. In computed tomography, this condition can present as a well- or ill-defined adipocytic mass, and it can be heterogeneous due to the presence of septa and other soft tissue components. Many researchers have reported that MRI has diagnostic value in distinguishing fatty tumors from other tumors due to its ability to detect fatty components.[13-15]

MRI typically shows a heterogeneous or lobulated mass, iso-intense or typically slightly hypo-intense to subcutaneous fat on T1-weighted MRI sequences, but often hyper-intense to normal muscle tissue. On T2-weighted sequences, the mass may be almost iso-intense to subcutaneous fat.[16,17]

The confirmation diagnosis is an anatomical pathology: histologically, these tumors have a lobulated architecture, composed of oval or round monomorphic cells, with a small central nucleus and eosinophilic granular or multi-vacuolated cytoplasm. Histological classification is based on the nature of the stroma and the appearance of multi-vacuolated cells: the typical form, the lipomatous tumor, the myxoid form, and the spindle cell hibernoma. Blood circulation is generally more abundant than in a lipoma. Complete surgical excision constitutes adequate management of hibernoma, preventing the mass effect of

this tumor on neighboring anatomical structures, and histologically affirming the diagnosis.[14,15,18]

CONCLUSION

Hibernoma is an uncommon benign tumor of the thigh. It is generally painless. It is slightly more common in men than women. Although hibernoma is a benign tumor with an excellent prognosis, accurate diagnosis is crucial to exclude more serious pathologies and ensure optimal management. Complete surgical exeresis remains the key to avoiding the risk of recurrence.

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