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Case Report

A case of a rare hibernoma tumour and a brief literature review

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ABSTRACT

Hibernomas refer to benign tumours of immature adipose tissue known a brown fat. They are most commonly found in areas where brown adipose tissue is still present in adulthood such as the shoulder, back, neck, best, arm and abdomen. This case study describes a 60 year old male who presented with a growing 15 mm lump in the right forearm. On examination, tenderness in the area surrounding the mass was elicited. A magnetic resonance image of the right forearm was performed which reported a large intramuscular lipomatous tumour within the brachioradialis muscle, in close relation to the neuromuscular bundle. Surgical excision was performed successfully. Histology was consistent with a diagnosis of a hibernoma tumour. The patient healed well with no evidence of infection or recurrence on follow up.

Keywords: Lipoma, Brown fat, Pain, Benign neoplasms, Hibernoma

INTRODUCTION

Hibernomas are rare tumours of adipose tissue, most commonly found in the population between 30-40 years of age. These tumours are found in areas with high content of brown adipose tissue such as the axillae, neck and interscapular region, cases have also shown these tumours in the abdomen, thighs and buttocks (Wei et al).[1] Hibernoma tumours consist of benign lipomatous tissue with a differentiation towards brown fat. Brown fat is mostly found in neonates and hibernating animals, with a physiological role in metabolism and thermogenesis. With age, brown fat is replaced by white fat, whilst brown fat persists in specific areas in which hibernomas may form (Gabra et al).[2]

Hibernomas usually present as incidental findings, as painless, mobile, firm, slow growing lumps in the subcutaneous tissue. A differential diagnosis may include fat necrosis, angiolipoma, giant cell tumour, rhabdomyosarcoma in children and an atypical lipoma or liposarcoma (Nasner et al).[3]

It is very rare for these tumours to undergo malignant transformation, most commonly occurring the setting of incomplete excision (Wei et al).[1] Treatment often consists of planned excision following core biopsy. Watchful waiting for non-growing tumours may be indicated in some clinical settings after malignancy is ruled out (Al Hmada et al.[4] We here present the case of a Hibernoma in a 60 year old gentleman.

CASE REPORT

A 60-year-old, previously healthy male, was referred to orthopaedic surgery in view of a growing lump in the right forearm. It was occasionally painful. The lump was on the anterolateral aspect of the right forearm, around 15 cm in diameter, clinically described as an intramuscular lipoma. A systems review showed no other clinical signs or symptoms. With regards to surgical history, he underwent previous surgery 9 years back, where general surgeons excised lipomas in the neck, right shoulder and abdominal wall. On histology these were reported as lipomas, showing mature lobulated adipose tissue with scattered

capillary vessels and a focal fibrous capsule. No atypical features were reported.

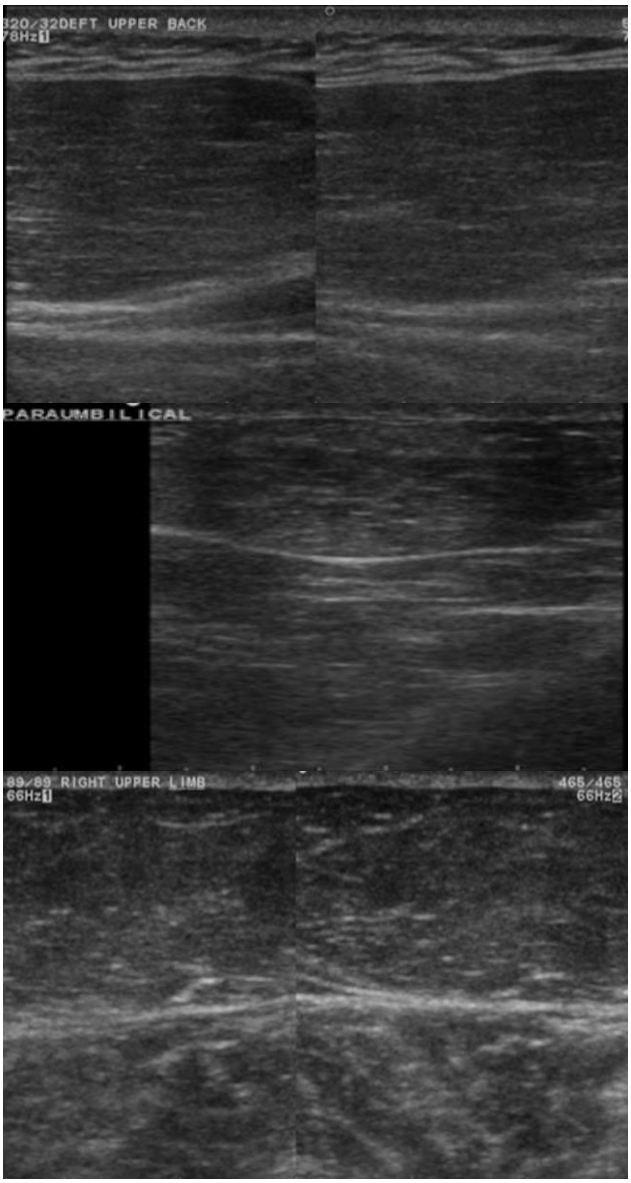

Figure 1: Ultrasound imaging of neck, abdomen and right shoulder respectively, each corresponding to hypo echoic masses in the fatty layer of the subcutaneous tissue.

There were no relevant family or social histories. On clinical examination of the arm there was some tenderness in the area surrounding the mass. A magnetic resonance image of the right forearm was ordered in order to investigate further the lump which was given an initial provisional diagnosis of a lipoma invading the muscle. Standard protocol MRI right forearm was performed. It reported that the clinically palpable lump was representing a large intramuscular lipomatous tumour measuring 6×3.5×13.8 cm. The lesion was lying within the brachioradialis muscle. No sinister features were identified. The apex of the lesion however was reported to be passing very close to the radial neuromuscular bundle.

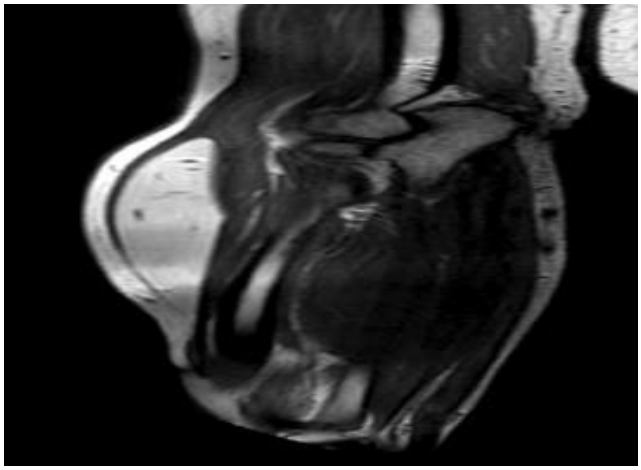

Figure 2: Coronal MRI view of the right forearm showing a hyperintense mass in the right forearm muscle with close proximity to the radial neuromuscular bundle.

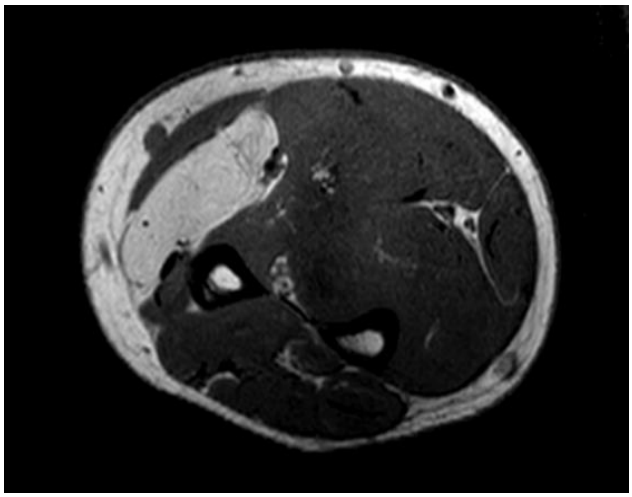

Figure 3: Transverse MRI view of the right forearm again showing the hyper intense mass.

Patient was prepared for immediate surgery. A tourniquet at 250 mmHg was applied for the duration of the surgery, a total of 65 minutes. Henry's approach to the forearm was applied, extended to elbow crease. The apex of the lesion was found distally and dissected carefully under the surface of the brachioradialis. The posterior interosseous nerve was identified and found to be running directly through the tumour. The nerve remained intact with careful dissection of the tumour. A biopsy was taken and sent to histology. The histology results reported that the lesion was made up of numerous lobules of brown fat cells composed of sheets of multi-vacuolated brown fat cells and micro vesicles. The tumour appeared to be at least surrounded by a thin fibrous capsule. No evidence of atypic was seen. This was consistent with a diagnosis of hibernoma tumour. On examination of the area during the outpatients follow up showed that the area was healing well, there were no signs of infection or recurrence and no reported tenderness.

DISCUSSION

Hibernoma is a benign tumour of the brown fat also known as immature adipose tissue, mainly because it is found predominantly in foetal tissue. It makes up to 5% of the body mass of an average neonate.[5] Brown adipose tissue unlike white adipose tissue has numerous mitochondria filled with iron hence giving it the brown colour.[4] In 1914, the tumour was given the name hibernoma by Gery because brown tissue is found in abundance in hibernating mammals.[7] Since most of the brown fat is not carried on to adulthood, most hibernomas are found in areas where the brown adipose tissue is still present. The most commonly reported areas from which this benign tumour arises are the thigh, followed by the shoulder, back, neck, chest, arm and least commonly in the abdominal cavity/ retroperitoneum. Our case demonstrated a hibernoma tumour which presented in the forearm. Hibernomas were most prevalent in 30 to 40 year olds and a slight female predominance was reported.[7] Although rare, our case showed a hibernoma which presented in a 60 year old male. Hibernomas present very similar to lipomas as they are firm however moveable and found in the subcutaneous layer of the skin. It may feel warm upon palpation because the adipose mass is very vascularised.

Although hibernomas may be suggested on imaging, a diagnosis may only be obtained upon histology. Hibernomas may often be misdiagnosed as lipomas or liposarcomas on clinical findings and imaging, and hence it is important to reply on histopathological findings for diagnosis. On histology, brown adipomas appear irregularly lobulated, well-demarcated and pliable oily masses, with a diameter between 5-10 cm (Wei et al).[1] On histology the hibernoma cells can be differentiated from normal adipocytes since a hibernoma would have a nucleus with surrounding granular eosinophilic cytoplasm in contrast with a normal adipocyte which would have a clear cytoplasm.[8] Hibernomas are classified into four different sub types of morphology, most common is typical found in 82% of cases, myxoid found in 8%, lipoma like in 7% and rest are spindle cell.[2] This reported case formed part of the typical subtype as the histology had reported the findings of multi-vacuolated cytoplasm.

It is essential to recognise the lipoma-like hibernoma when present, in order to avoid misdiagnosis and extreme treatment. When compared to lipoma-like hibernomas, atypical lipomatous tumours and well-differentiated liposarcomas may recur and dedifferentiate to a dedifferentiated liposarcoma, with an ability to metastasise in 5% of cases exhibiting recurrence. The mainstay of treatment for hibernomas is surgical excision. Hibernomas rarely recur and do not meta size (Gabra et al).[6] This was evident in our case since our patient did not exhibit recurrence or any sign of metastasis on follow up.

CONCLUSION

Hibernomas are rare, benign tumours derived from brown fatty tissue. Fewer than a total of 200 cases have been reported in literature. These tumours are slow growing and painless, mostly present in the neck, upper trunk and neck. Our case showed a 60 year old male with a hibernoma which presented in the forearm. The treatment for hibernomas is surgical excision, however hibernomas are benign tumours with no tendency to recur or meta size. Although hibernomas are rare, it is important to keep this diagnosis in mind as part of a differential diagnosis in order to avoid misdiagnosis and mismanagement.

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