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**Case Report**

# Not just another hernia: a rare case of groin hibernoma

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## ABSTRACT

Hibernoma is a rare, benign tumor originating from brown fat, often misdiagnosed due to its resemblance to liposarcoma. We present a case of a 29-year-old male with a painless, progressively enlarging mass in the right groin. Clinical and radiological evaluation suggested a lipomatous tumor. Complete surgical excision was performed, and histopathology confirmed a diagnosis of a hibernoma. This report emphasizes the importance of considering hibernoma in the differential diagnosis of groin masses and the pivotal role of histopathology in reaching a definitive diagnosis.

**Keywords:** Hibernoma, Groin mass, Irreducible hernia, Brown fat

## INTRODUCTION

Hibernoma is a rare benign lipomatous tumor derivedfrom residual brown fat, first described by Merkel in 1906 and later named by Gery in 1914.[1,2] It most commonly affects individuals in their third to fourth decades of life, with a slight male predominance. Typical sites include the thigh, shoulder, back, neck, chest, and axilla.[3] Clinically, hibernomas often present as slowly growing, painless masses, and may mimic malignant lesions such as well-differentiated liposarcoma or atypical lipomatous tumors.[2,3] This report presents a rare case of hibernoma in the right groin, mimicking an irreducible inguinal hernia.

## CASE REPORT

A 29 year old male presented with incidental discovery of a painless mass in right groin for the last 1 year, gradually progressive in size. He reported constant sensation of mild discomfort in the inguinal region. The mass was non reducible and showed no variation in size on lying down or manipulation. There were no gastrointestinal, genitourinary, or constitutional symptoms, and no relevant family or social history.

On physical examination, an 8×5 cm ovoid mass was palpable deep in the right inguinal region with mild tenderness. The lump was non-reducible and had restricted mobility. No palpable lymphadenopathy, organomegaly or evidence of external hernias was noted. The remainder of the examination was unremarkable. Laboratory studies, including white cell count, haematocrit, electrolytes and liver function tests were within normal limits.

Ultrasound scan of the abdomen revealed a homogeneously hyperechoic mass measuring 85×45×37 mm, suggestive of lipoma.

Surgical exploration was performed via a 7 cm supra-inguinal linear skin incision. The mass was well localized, overlying the external oblique muscle with its vascular pedicle seen emerging from underneath the muscle. The external oblique muscle was divided up to the superficial inguinal ring and the inferior flap dissected to expose and ligate the feeder vessels. The mass was excised completely. The external oblique muscle, aponeurosis and skin were reapproximated in layers.

Macroscopic examination revealed a fatty, tan red to brownish mass with rubbery consistency, measuring 85×42×35 mm. The cut surface lacked necrosis, haemorrhagic or fibrous septae formation. Microscopically the tumour consisted of lobules of brown fat with abundant macrovesicles (Figure 3-5), without evidence of increased mitotic activity or infiltrative margins. IHC marker-S100 (Figure 6) was tested for, which was immunoreactive with a score of 3+ in lesional cells.

The postoperative course was uneventful. Review at 4 weeks and again at 6 months revealed no ongoing symptoms or evidence of recurrence.

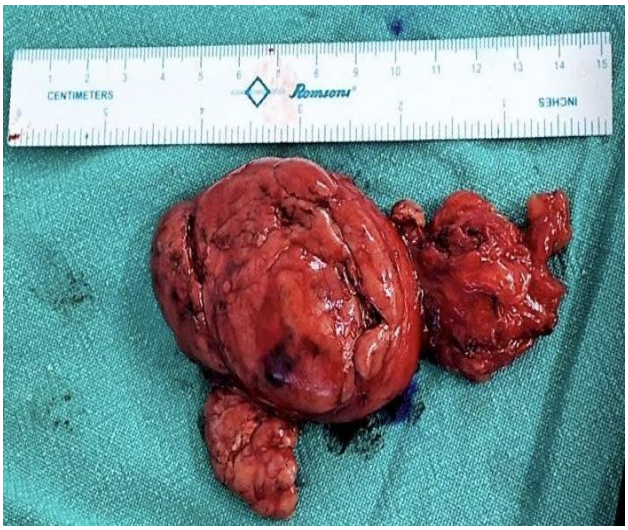


**Figure 1: Excised gross specimen showing well-circumscribed tan-red mass.**

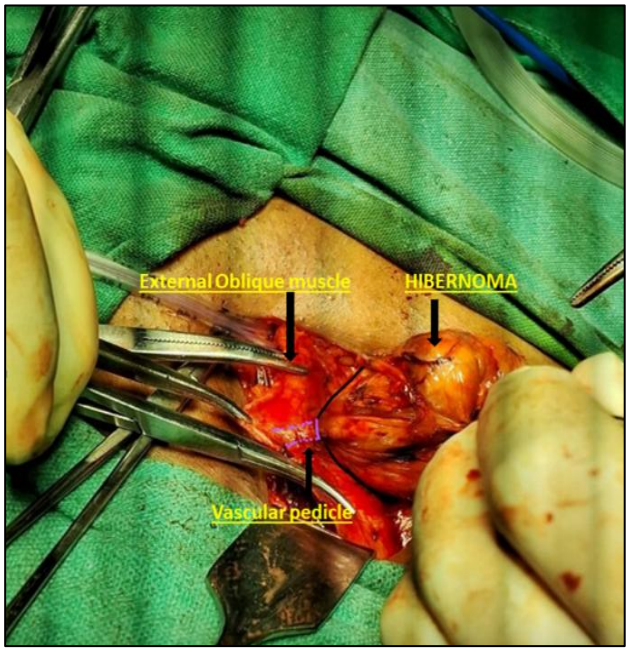


**Figure 2: Intraoperative view: vascular pedicle of the mass embedded beneath the external oblique muscle.**

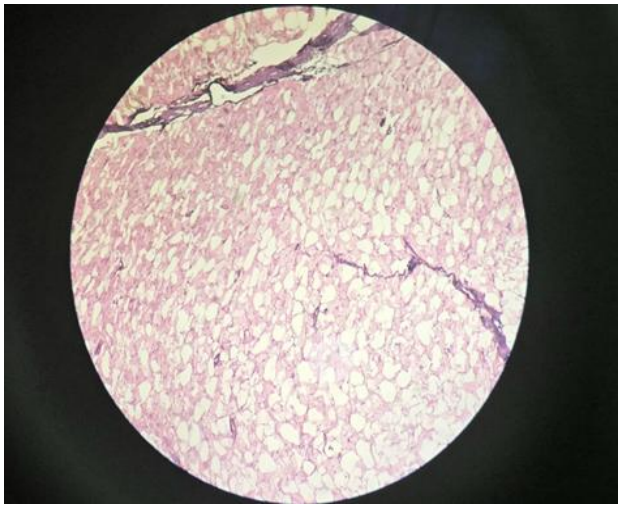

**Figure 3: Low power (10×): benign adipocytes with granular eosinophilic cytoplasm and central to peripheral nuclei.**

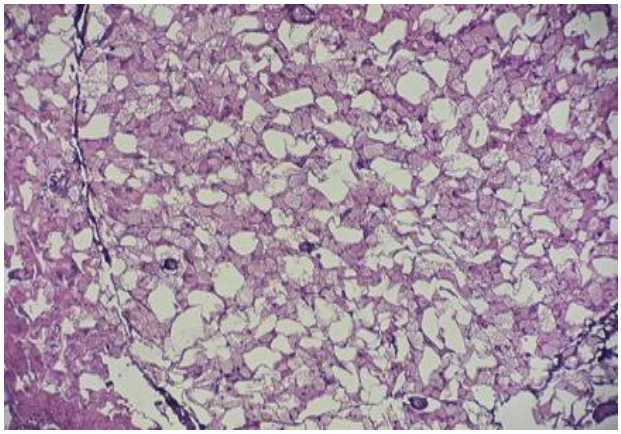

**Figure 4: High power (40×): sheets of brown fat cells with granular vacuolated cytoplasm.**

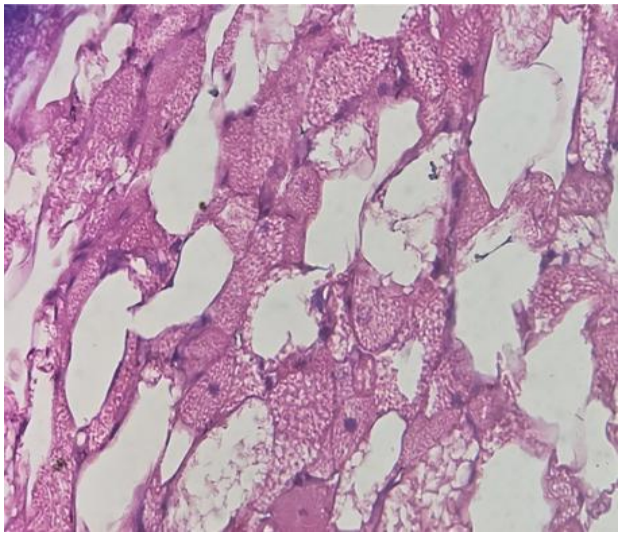

**Figure 5: High power (100×): mixture of brown and white fat cells with multi vacuolated eosinophilic cytoplasm and central nuclei.**

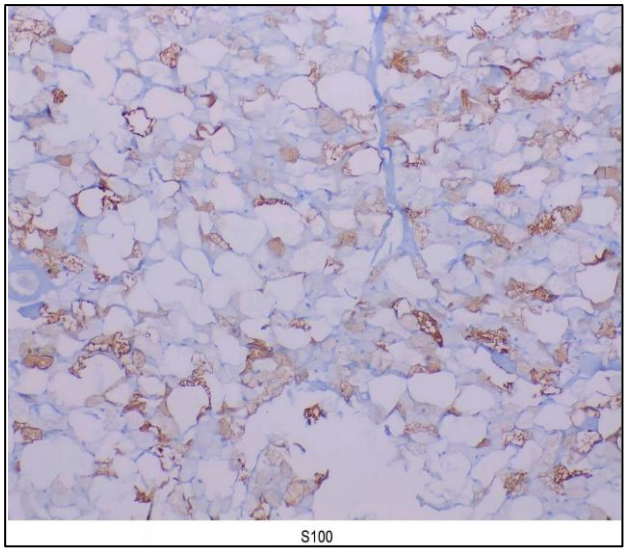


**Figure 6: S100 protein immunohistochemistry highlights scattered brown fat cells.**

## DISCUSSION

Hibernomas are rare benign soft tissue tumors originating from brown adipose tissue, with fewer than 250 cases documented in the literature to date.[3] They usually occur in anatomical regions where residual brown fat persists. Clinically, they present as slow growing, painless and well-circumscribed masses.

Hibernomas often resemble lipomas or liposarcomas radiologically, making diagnosis difficult. On MRI typically appear as well-circumscribed, heterogeneous mass with high signal intensity on T1- and T2-weighted images and contrast enhancement due to their vascularity.[7] However, imaging characteristics are not pathognomonic and cannot definitively differentiate hibernomas from other lipomatous neoplasms.

Histopathological examination remains the gold standard for diagnosis. Histologically, hibernomas are classified into four subtypes: typical (82%), myxoid (8%), lipoma-like (7%), and spindle cell.[3,4] They are characterized by multi vacuolated eosinophilic cells with centrally located nuclei, distinguishing them from other lipomatous tumors. The absence of cytologic atypia, mitotic figures, and necrosis further supports their benign nature.[3-6] Immunohistochemically, these tumors are consistently positive for S-100 protein, a marker indicative of adipocyte lineage. In this case, S-100 positivity supported the diagnosis and aiding in the exclusion of malignancy.

Surgically, the high vascularity of hibernomas necessitates meticulous dissection and ligation of feeding vessels to minimize intraoperative bleeding. Nevertheless, complete excision is curative, and there have been no documented cases of recurrence or malignant transformation to date.[7] Thus, awareness and recognition of this rare entity are essential to avoid unnecessary aggressive interventions.

This case uniquely illustrates a hibernoma arising in the groin, mimicking an irreducible inguinal hernia. Typically, irreducible hernias present as firm, non-compressible and persistent lumps in the inguinal area-findings that were similarly observed in our patient. However, unlike hernias, hibernomas do not exhibit fluctuation in size with straining or positional changes and lack bowel sounds or associated gastrointestinal symptoms.

The firm, immobile nature of the mass in this case, along with its persistence and mild tenderness, initially pointed towards a diagnosis of incarcerated or irreducible hernia. However, the absence of classical hernia signs, absence of reducibility and the unusual location prompted further radiological evaluation. Despite the imaging appearing suggestive of a lipomatous lesion, the suspicion of a more complex pathology remained. This highlights the importance of maintaining a broad differential diagnosis when approaching groin masses.

## CONCLUSION

Hibernoma should be considered in the differential diagnosis of slow-growing, lipomatous tumors, particularly when located in atypical regions such as the groin. Due to their overlapping radiological features with liposarcomas, definitive diagnosis relies on histopathological confirmation. Surgical excision is curative, with no reported cases of recurrence or malignant transformation. Increased awareness of this benign tumor can prevent misdiagnosis and avoid overtreatment.

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