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Review Article

Lipoma: neoplasm beyond boundaries

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ABSTRACT

Lipoma is one of the commonest mesenchymal tumours arising from fat cells of the adult type. It is benign in nature in majority of cases. However, conversion to liposarcoma is described especially in lipomas situated in the retroperitoneum and thigh. Lipomas may be associated with variety of familial syndromes. In such situations they are mostly multiple. Typical physical signs of lobulated nature, slipping sign and pseudo-fluctuation are diagnostic of benign lipomas. MRI is essential to confirm the exact location, extent and infiltration of the surrounding tissues especially when malignant change is suspected. FNAC helps in establishing the diagnosis. Meticulous complete excision is the mainstay of treatment taking utmost care to avoid breach of capsule. Recurrence rate is extremely low.

Keywords: Lipoma, Diagnosis, Treatment

INTRODUCTION

Lipomas are benign mesenchymal tumours arising from fat cells or adipocytes.[1,2] They can be located anywhere in the body and usually present as painless masses. They have variable size which may exceed 10 cm in a few cases. Majority of lipomas are benign in nature.[3,4]

AETIOLOGY

Lipoma constitutes the most common mesenchymal tumour. Majority affect the trunk and upper extremity.[5,6] But they can be situated anywhere on the body wherever there are fat cells.[7] The exact aetiology of lipomas is unknown. However, a potential link between trauma and lipoma has been postulated. Trauma causes cytokine release and may trigger pre-adipocyte differentiation and maturation.[8-10] Genetic predisposition may be responsible in 2-3% of the affected patients who usually present with multiple lesions.[10,11] Gene association of chromosome 12 in solitary lipomas as well as a mutation in the HMGA 2-LPP may be present in a few tumours.[12] Obesity, hyperlipidaemia and diabetes may be responsible in a few cases.[11] Males in the 4th-5th decade of life are more commonly affected than females. Multiple lipomatosis can be a constituent of many syndromes (Table 1).[11]

Table 1: Syndromes associated with multiple lipomatosis.

Syndrome	Description
Proteus syndrome	Mutation in AKTI oncogene. It may be composed of lipomas, haemangiomas, palmoplantar cerebriform connective tissue, epidermal nevi, scoliosis and hyperostosis of the epiphysis.
Familial multiple lipomatosis	Prevalent in the 4th decade of life with numerous encapsulated noninfiltrating lipomas.
Dercum's disease	Patient complains of several painful lipomas on trunk and extremities with pins and needles sensation over the affected area. Usually seen in post-menopausal women.

Continued.

Syndrome	Description
MEN type-1	Autosomal dominant mutation in this gene, involving pituitary, parathyroid and pancreatic tumors. It may feature with café au lait spot, angiofibromas, collagenomas and several lipomas
Cowden syndrome	PTEN gene is affected. Associated with oral papilloma's, punctate palmar keratoses, multiple lipomas and malignancy including hamartomatous polyp of the GI tract, endometrial carcinoma etc.
Gardner's syndrome	Mutation is in the adenomatous polyposis coli (APC) gene. They usually develop adenocarcinoma of the GI tract. Other clinical features include osteomas of the skull, supernumerary teeth, malignancy like thyroid papillary carcinoma, hepatoblastoma and adrenal adenoma. The patient may present with multiple lipomas
Bannayan-Riley-Ruvalcaba syndrome	PTEN gene is affected. May simulate the pediatric version of Cowden syndrome. Symptoms may vary from an intestinal hamartoma, multiple lipomas, mental retardation, macrocephaly, genital lentigines
Benign symmetrical lipomatosis	Diffuse, infiltrative, symmetrical painless lipomatous growth affecting head and upper trunk. Mitochondrial tRNA lysine gene is affected

PATHOLOGY

Exact pathophysiology is unclear. Benign lipomas can arise from any part of the body which has fat cells. Hence the tumour is rightly described as 'ubiquitous' tumour.[13,14] Majority of lipomas lie in subcutaneous plane and are freely mobile. However, lipomas situated in the deeper layers may infiltrate the muscles. GI tract is also site for sub-mucosal lipomas. They are commonly located in small intestine, stomach and the oesophagus. They cause symptoms either due to mucosal erosion or mechanical obstruction. Lipomas in ileum are usually pedunculated and may cause obstruction and intussusception.[15-17] More and more genetic abnormalities have been identified. These include mutation in chromosome 12q 13-15 in 65% of the cases, deletion of 13q in 10% of cases and rearrangement of 6p 21-33 in 5% of cases. Unidentified mutations may be seen in 15-20% of cases.[17,18]

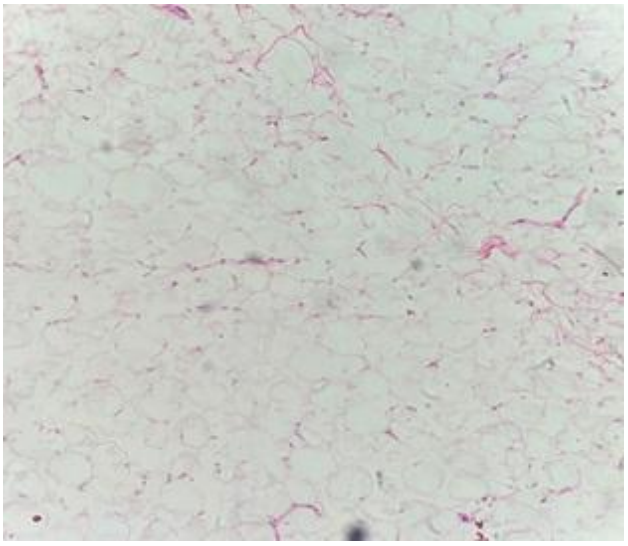

Figure 1: Histopathology of a lipoma of typical fats cells.

Mature adipocytes typically have a small eccentric nucleus intermixed with thin fibrous septa containing blood vessels.[19,20] These characteristics are exactly similar to fat cells in the subcutaneous tissue (Figure 1). There may be other variants of lipomas in which there may be other tissue components such as myelolipoma, angiolipoma, spindle cell lipoma, pleomorphic lipoma. Lipomyosarcoma is a malignant variant containing lipoblasts characterized by coarse vacuoles and scalloped hyperchromatic nuclei.[21]

CLINICAL FEATURES

Lipoma usually presents as a painless soft, freely mobile subcutaneous swelling. Diagnostic signs are slipping sign, lobulated feel and pseudo fluctuation. They may attain very large size exceeding 10 cm thereby being referred to as giant lipoma. Nape of the neck, upper trunk, forearm and proximal part of the extremities are common sites. They may occur at any plane such as subcutaneous, deep dermal, sub fascial, intermuscular and retroperitoneal sites. Lipomas which are retroperitoneal or in the thigh have malignant potential.[21] The use of protease inhibitor may cause lipodystrophy and induce lipomas.[21] The location and size of the lipoma may determine the spectrum of clinical presentation. Intraluminal lipomas especially within the gut can cause dysphagia, obstruction, regurgitation, vomiting and occasionally respiratory complications as well.[22] The attending surgeon must be cautious in assessing lipomas which exhibit the following characteristics: Size>10 cm, rapid growth, onset of pain, fixity to underlying tissue and deep location in the thigh and retroperitoneal space.

Confirmation of the diagnosis is essential to develop a treatment plan. In superficial lipomas, MRI is the investigation of choice (Figure 2).[23] It provides the specific information: Site of the lipoma, size of the lipoma, infiltration of deeper structures and vascularity.

If there is suspicion of liposarcoma, pre-operative FNAC is mandatory to ascertain the diagnosis. For intraluminal GI lipomas, CECT of the abdomen is diagnostic and provides a lead to diagnosis. If endoscopically accessible, biopsy can be done for intraluminal lesions. [24,25]

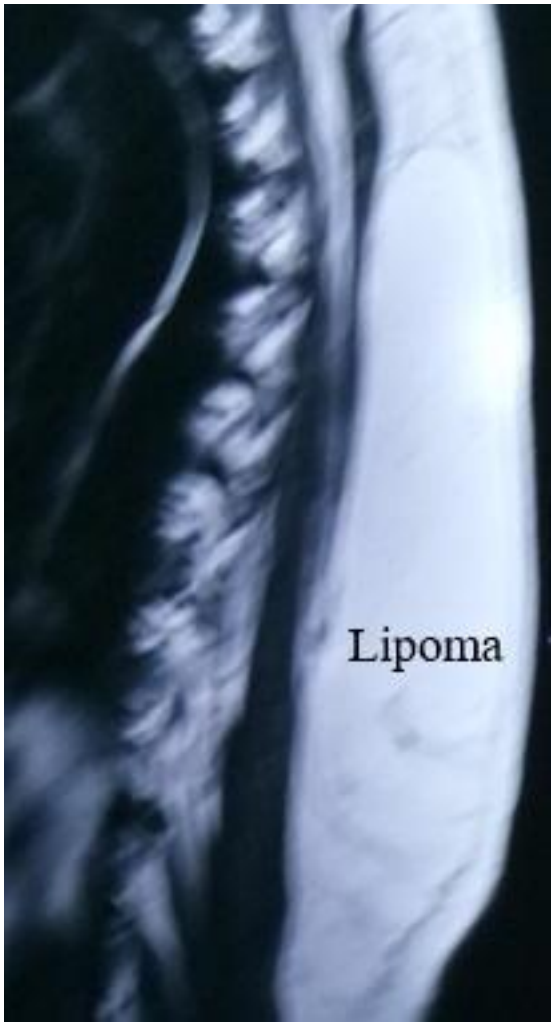

Figure 2: MRI showing a lipoma.

TREATMENT

Surgery is the mainstay of treatment. Complete excision of the tumour along with the capsule is necessary to prevent recurrence. Liposuction can be done in established benign lipomas. In case of giant lipomas removed by wide local excision, negative suction drain is used to obliterate the dead space. In GI lipomas exploratory laparotomy with resection anastomosis of the bowel containing the lipoma is the mainstay of treatment. In liposarcoma and deep-seated lipoma a wide local excision is the treatment of choice.

CONCLUSION

Lipoma continues to be described as a ubiquitous tumour due to its omnipresence as it can present in any part of the body. Imaging in the form of MRI is essential to plan the surgical treatment. Tissue diagnosis is necessary in cases of lipomas wherein malignancy is suspected. Complete surgical excision is the mainstay of surgical treatment.

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