

Histopathological study of tumours of adipose tissue

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Abstract

Background: Tumours of adipose tissue form one of the largest single groups of soft tissue tumours. The benign, subcutaneous lipoma is the most common soft tissue neoplasm in adults, liposarcoma being the most common primary soft tissue malignancy. **Objective:** To study the morphological features of the various adipocytic tumours received in the Department of Pathology. **Materials and Methods:** Cases of adipocytic tumours were retrieved from the archives of the Department of Pathology. **Results:** The total number of cases numbered 155. Amongst these, 143 (92%) were benign and 12 (8%) were malignant. In benign cases, patients were in the age group 4-75 years, with 88 males and 55 females. Among the malignant cases, patients were in the age group 14-68 years, with 7 males and 5 females. The peak age distribution in both benign and malignant cases was in the fourth decade. The most common site of involvement was the nape of neck, followed by back and upper limbs. Conventional lipoma was the most common benign tumour. Variants of lipoma like angioliipoma, chondroid lipoma, dermolipoma etc was noted. Of the 12 malignant tumours, 6 cases were well differentiated liposarcoma, 2 cases variant of myxoid liposarcoma, and one case each of pleomorphic liposarcoma, lipoleiomyosarcoma and lipoma with sarcomatous changes. **Conclusion:** Conventional lipomas were the most common adipocytic soft tissue tumours. Malignant cases were rare, and among them, the most common malignant tumour was well-differentiated liposarcoma.

Key Words: lipoma, liposarcoma, myxoid, well-differentiated.

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INTRODUCTION

Adipocytic tumours represent the largest single subtype of soft tissue tumours.¹ Benign, subcutaneous lipomas are the most common soft tissue neoplasm in adults, with liposarcoma being the most common primary malignancy of the soft tissue.^{1,2} The benign varieties are managed by surgical excision and have a better prognosis when compared with the malignant forms which are associated with a high fatality rate.³ Hence, a detailed study of these lesions is of immense value especially in the case of malignant tumours and even the benign ones, owing to the possibility of malignant transformation.³ This study

analyses the various adipocytic tumours including age, sex, site, size of tumour and histopathology.

MATERIALS AND METHODS

This was a retrospective study covering a period of 5 years (December 2011- November 2016). The demographic findings and complete clinical details, of all the patients included in the study, were recorded. The specimens were received in 10% formalin and grossing was done according to the standard protocol. The tissues were processed and paraffin embedded, and the sections were stained with Haematoxylin and Eosin. Immunohistochemical staining was done where ever possible.

RESULTS

One hundred and fifty five specimens were analysed, out of which, 143 (92%) were benign and 12 (8%) were malignant. The benign tumours comprised of conventional lipoma (n=121), fibrolipoma (n=9), intramuscular lipoma (n=5). Other tumours such as angioliipoma, chondroid lipoma, dermolipoma, spindle cell lipoma, lipomatous hamartoma and neural lipoma accounted for 1 case each. In our study group, the patients

presenting with benign adipocytic tumours fell within an age range of 4 years to 75 years of age. This group consisted of 88 males and 55 females. The peak incidence of these benign tumours, in our study, was seen to be in the 4th decade of life. Conventional lipomas were the most common benign tumour. The most common site of involvement was the nape of the neck, followed by the back and gluteal region. The largest benign tumour encountered in our study measured 17 cms in its greatest dimension. Details of the benign adipocytic tumours including age, sex site and size of tumour is given in Table 1.

Table 1: Details of the benign adipocytic tumours with age, sex, site and size of tumour

Diagnosis [number of cases (n)]	Age (years)	Sex (M:F)	Site	Tumour size (cms)
Conventional lipoma (n=121)	8-75	1.6:1	Nape of neck, back, gluteus	1-17
Fibrolipoma (n=9)	25-64	8:1	Neck, head, back	2-4
Intramuscular lipoma (n=5)	14-55	1:4	Gluteus, arm forearm	2-15
Angiolipoma (n=1)	33	1:0	Right arm	5x4x3
Chondroid lipoma (n=1)	4	0:1	Neck	1x0.5x0.5
Spindle cell lipoma (n=1)	32	1:0	Left foot	4x3x2
Dermolipoma (n=1)	4	1:0	Right eye	1.5x1.5x0.5
Neural fibrolipoma (n=1)	38	0:1	Left ankle	4x1x1
Lipomatous hamartoma (n=1)	4	1:0	Right loin	5x4x3
Lipomeningocele (n=1)	5	0:1	Lower back	7x4x2
Lipoma with secondary Change(n=1)	43	1:0	Right inguinal	5x4x3

The patients with malignant tumours fell within an age range of 14 to 68 years of age. The peak incidence of these malignant soft tissue tumours was also in the 4th decade of life. Well-differentiated liposarcomas accounted for the most commonly seen malignant tumour in our study. The most common site of involvement was the thigh followed by the retroperitoneum, shoulder and spermatic cord in that order. The largest malignant tumour encountered in our study measured 34cm in its greatest dimension. Details of malignant adipocytic tumours including age, sex, site and tumour size is given in Table 2. The gross and microscopic features of some of the tumours encountered in our study are shown in figures 1 and 2.

Table 2: Details of liposarcomas with age, sex, site and size of tumour

Diagnosis [number of cases (n)]	Age (years)	Sex	Site	Tumour size (cms)
Atypical liposarcoma / Well-differentiated liposarcoma (n=7)	14-56	5:2	Right thigh, retroperitoneum, spermatic cord	8-34
Myxoid liposarcoma (n=2)	68 48	1:1	Right shoulder Right thigh	10-21
Pleomorphic liposarcoma (n=1)	60	0:1	Left thigh	32x24x11
Lipoleiomyosarcoma (n=1)	68	1:0	Left thigh	17x15x4
Lipoma with sarcomatous change (n=1)	55	0:1	Left thigh	7x5x3

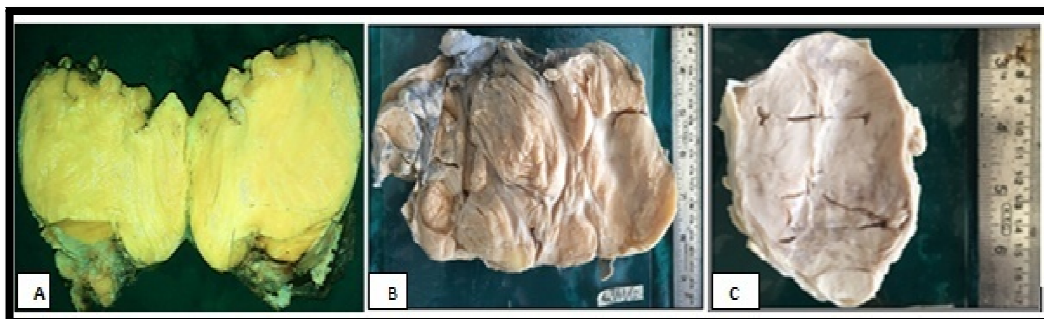


Figure 1 A: Cut surface of well differentiated liposarcoma- homogenous, pale yellow. B: Cut surface of atypical lipomatous tumour- yellowish, lobulated and shows a brownish black area. C: Cut surface of myxoid liposarcoma- grey white to yellow with lobulated areas. It is gelatinous in consistency with a mucoid slimy surface.

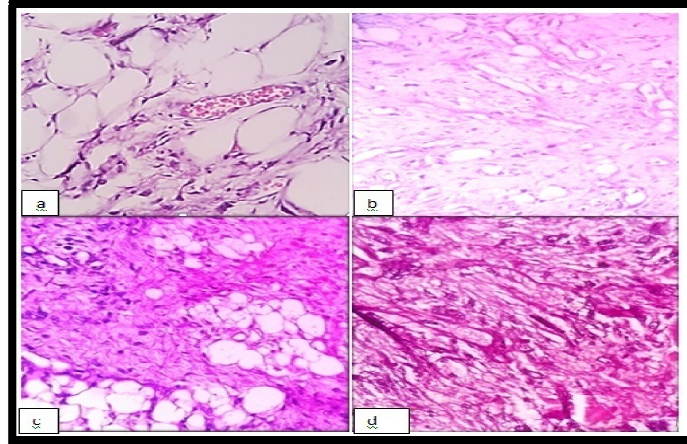


Figure 2: A: Well-differentiated liposarcoma showing lipoblasts and atypical hyperchromatic cells. (HandE, x10)

B: Myxoid liposarcoma showing uniform to round oval cells in myxoid stroma, rich in delicate arborising chicken-wire capillary vasculature along with monovacuolated and multivacuolated lipoblasts. (HandE, x10)

C: Lipoleiomyosarcoma showing spindle shaped cells arranged in interlacing bundles, with moderately pleomorphic hyperchromatic nuclei and neoplastic fat cells. (HandE, x10)

D: Pleomorphic liposarcoma showing pleomorphic, multivacuolated lipoblasts with bizarre, hyperchromatic and scalloped nuclei in a myxoid stroma. (HandE, x40)

DISCUSSION

Adipocytic tumours constitute one third of all soft tissue tumours. They are also the most commonly occurring. Benign lipomatous tumours include conventional lipoma, lipoblastoma, angioliipoma, myoliipoma, chondroid lipoma, spindle cell lipoma and hibernoma.² Conventional lipomas are common and are usually seen in adults over the age of 30, they are rarely more than 10 cm in size and are histologically composed of mature isomorphic adipocytes admixed with collagenous fibrous tissue. The most common sites of occurrence are the trunk and proximal limbs.⁴ In our study the most common site, however was the nape of neck. Lipomas are uncommonly seen in children. However in our study 23 cases of conventional lipoma in children below the age of 15 were seen. Angioliipomas are common benign subcutaneous and usually multiple. It is predominantly seen in adult males. The most common site is upper limbs, especially, the forearm. The lesions are usually less than 2 cms in size and may present with pain and tenderness. Histologically they differ from conventional lipomas by the presence of thin walled vessels situated mainly at the periphery of the tumour. Classically, these vessels contain small fibrin thrombi. If the vascular component comprises more than 90% of tumour, it is sometimes termed as a cellular angioliipoma.¹ Only one case of angioliipoma was seen in our study. Chondroid lipomas are uncommon entities which are readily mistaken for sarcomas because of the close resemblance of its constituent cells to lipoblasts and chondroblasts. Adult women are most commonly affected and it shows

no specific predilection for any particular anatomic site. Histologically, they are composed of abundant uni and multivacuolated lipoblasts embedded in a myxoid to hyalinised chondroid matrix admixed with variable amount of mature adipose tissue.¹ In our study, we reported a case of chondroid lipoma in a 4 year old child who presented with swelling in the nape of neck. Spindle cell lipomas are common and is predominantly seen in males in their late adult life. The usual presentation is of a circumscribed, subcutaneous lesion on the posterior neck and shoulder areas. Histologically, these tumours are composed of bland spindle cells along with bundles of thick roopy collagen fibres and a small number of adipocytes.⁵ In our study we encountered one case of spindle cell lipoma, who presented with a single lesion over the left foot. Atypical lipomatous tumour/well-differentiated liposarcoma is an intermediate malignant mesenchymal neoplasm which accounts for 40-45% of all liposarcomas. The most common sites of occurrence are the thigh, retroperitoneum, paratesticular area and mediastinum.⁶ These lesions mostly occur in 5th to 7th decade of life with no predilection towards either gender. Histologically, they are subdivided into four types: adipocytic (lipoma-like), sclerosing, inflammatory and spindle cell.² In our study, the majority of the patients were in the 5th decade of life and most common sites of involvement were thigh and retroperitoneum. The malignant lipomatous tumours include dedifferentiated liposarcoma, myxoid liposarcoma and pleomorphic liposarcoma.² Myxoid liposarcomas accounts for 30- 35% of liposarcomas and is the second most common subtype of liposarcoma. These tumours do not have any gender

predilection and is seen commonly in the 4th and 5th decades of life. They usually present as a large painless mass within the deep soft tissues of the limbs. Histologically, they consist of undifferentiated small spindle cells and small lipoblasts in a prominent myxoid stroma, rich in delicate, arborising, “chicken wire” capillary vasculature.² Two cases of this tumour was seen in our study. Pleomorphic liposarcomas are the rarest subtype of liposarcoma and account for 5% of all liposarcomas. The majority of these tumours arise in elderly patients with an equal sex distribution. Histologically they are composed of pleomorphic, spindle shaped tumour cells admixed with multinucleated giant cells and pleomorphic, multivacuolated lipoblasts with bizarre, hyperchromatic and scalloped nuclei.² In our study, we reported one case of pleomorphic liposarcoma in a 60year old female who presented with a large swelling over the right thigh. In our study, majority of the tumours were benign and accounted for 92% of all the cases and a few malignant (8%). This observation is similar to studies done by Rydholm *et al*⁷ and Mohammed *et al*⁸. Gender distribution of adipocytic tumours differ from study to study. We observed a male preponderance which is similar to the findings published by Rydholm *et al*⁷, whereas Mohammed *et al*⁸ reported a female preponderance in their study of adipocytic tumours. Peak incidence in our study was seen in the fourth decade, whereas Mohammed *et al*⁸ reported a peak incidence in the fifth decade. The most common site of involvement in our study was the head and neck region followed by the trunk and upper limbs, which is similar to the findings of Mohammed *et al*⁸ and Seleye *et al*⁹. Liposarcoma is the commonest sarcoma of adults and is commonly seen in those aged between 40 and 60 years, and rarely in children. Our cases occurred within this same age group, while 2 cases were seen in the age group 14-25 years. In our study, well differentiated liposarcoma was the most common malignant tumour, which is similar to the study conducted by Odokuma *et al*¹⁰. However, myxoid liposarcoma was the most common malignant tumour accounted in study done by Mohammed *et al*⁸.

CONCLUSION

Conventional lipomas are the most common adipocytic soft tissue tumours. Malignant cases are rare, and among them, the most common malignant tumour is the well-differentiated liposarcomas. Differentiating an atypical lipoma/well-differentiated liposarcoma from a lipoma is of paramount importance due to the difference in the behaviour of the tumour.

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