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*Original Research Article*

# Histopathological Spectrum of Adipocytic Tumors in a Tertiary Care Centre in South India: A 10 Year Study

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**Abstract**

*Introduction:* Lipomatous tumors are one of the most common neoplasms in humans and are one of the very complex areas of soft tissue tumors. These tumors vary greatly in incidence, clinical presentation, gross, microscopic appearance and also in biological behavior. *Aim:* The goal of this study was to find out the ten year incidence, histological spectrum and demographic features of lipomatous tumors in a tertiary care centre in Kerala. *Materials and Methods:* This is a retrospective study conducted in Department of Pathology, Sree Narayana Institute of Medical Sciences, Eranakulam. We collected the information regarding all resected cases of lipomatous tumors in last 10 years (April 2009 to March 2019) from departmental records and also from MRD. Tissues were received in 10% formalin, processed and stained with hematoxylin and eosin staining. *Results:* It is seen that out of 418 lipomatous tumors reported in our department in last ten years, commonest one being mature lipoma followed by angiolipoma. Most of the tumors were benign with one well differentiated liposarcoma and four cases of high grade liposarcoma. Tumors seen more in males (67%). The common sites affected are head and neck, trunk, extremities, shoulder etc. Malignant tumors were seen mainly in elderly population and occur in deeper soft tissues. *Conclusions:* Detailed histopathological examination combined with novel diagnostic techniques like molecular studies can be more helpful in reaching correct diagnosis and further studies are recommended in this area.

**Keywords:** Soft tissue, Lipoma; Sarcoma

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## Introduction

Lipomatous tumors includes one of the most common neoplasms in humans and also form one of the very complex areas of soft tissue tumors.[1] The subtypes of different lipomatous tumors vary greatly in their incidence, clinical presentation, gross, microscopic appearance and also in biological behavior.

Lipomatous tumors form the most common soft tissue tumor forming about 16% of all mesenchymal tumors.[2] Most of the tumors are

benign in nature and are composed of mature adipocytes with uniform nuclei. Lipomatous tumors are usually seen in middle aged adults, no specific gender or ethnic difference are seen in their incidence. These tumors are found to be rare in children. Benign lipomatous tumors are commonly seen in subcutaneous areas in trunk, back, shoulder, neck, and proximal extremities while malignant tumors like liposarcoma are usually deep seated. These tumors are seen in unusual sites including oral cavity, pancreas, breast, and intestines. Lipomatous tumors can be multiple especially angiolipomas which are more common in women, often familial and seen to be associated with neurofibromatosis or multiple endocrine neoplasia syndromes.

Benign adipocytic tumors are treated by Excision, but 1–4% recur. Malignant tumors require excision with adequate margins and also adjuvant treatment. Grossly these tumors are yellowish in color with lobulated cut section; while malignant tumors show hemorrhagic and necrotic appearance. Light microscopy show mature adipocytes in benign tumors with lipoblasts and dedifferentiated area in malignant ones. Immunohistochemically tumor cells will show positivity for vimentin, S 100 and CD 34. Electron microscopy shows mature adipocytes which have univacuolar peripheral compressed nuclei and pinocytotic vessels. 55%–75% of lipomas showing cytogenetic abnormalities have rearrangements of HMGA2/HMGIC at 12q13–15.

### *Aims*

The goal of this study was to find out the ten year incidence, histological spectrum and demographic features of lipomatous tumors in a tertiary care centre in Kerala.

## Materials and Methods

This is a retrospective study conducted in the Department of Pathology, Sree Narayana Institute of Medical Sciences, Eranakulam. We collected the information regarding all resected cases of lipomatous tumors in last 10 years (April 2009 to March 2019) from departmental records and also from MRD. The collected information include patient characteristics like age and sex, tumor characteristics like site, size, histological type, etc. Tissues were routinely received in 10% formalin, processed and stained with hematoxylin and eosin staining.

## Results

It is seen that a total of 418 cases of lipomatous tumors reported in our department. Commonest one being mature lipoma followed by angiolipoma (Table 1). Most of the tumors were benign with one case of well differentiated liposarcoma and four cases of high grade liposarcoma. Tumors seen more in males (67%) compared to females. Most tumors occur in 40–50 age group (Table 2). The common sites affected by adipocytic tumors include head and neck, trunk, extremities, shoulder etc (Table 3). Malignant tumors were seen mainly in elderly population and occur in deeper soft tissues (Table 4).

**Table 1:** Distribution of different histopathological type of adipocytic tumors.

| | Histopathological type | Number |
|---|---|---|
| 1 | Lipoma | 192 |
| 2 | Angiolipoma | 119 |
| 3 | Fibrolipoma | 74 |
| 4 | Myolipoma | 6 |
| 5 | Spindle cell lipoma | 12 |
| 6 | Pleomorphic lipoma | 7 |
| 7 | Multiple lipoma | 3 |
| 8 | Well differentiated liposarcoma | 1 |
| 9 | Liposarcoma | 4 |

**Table 2:** Distribution of adipocytic tumors according to age

| Age | Number |
|---|---|
| <20 | 7 |
| 20–30 | 39 |
| 30–40 | 104 |
| 40–50 | 118 |
| 50–60 | 103 |
| 60–70 | 35 |
| >70 | 12 |

**Table 3:** Distribution of adipocytic tumors according to site

| Site | Number |
|---|---|
| Head and neck | 106 |
| Shoulder | 54 |
| Trunk | 103 |
| Upper limb | 65 |
| Lower limb | 86 |
| Deep | 4 |

**Table 4:** Characteristics of malignant adipocytic tumors

| Number | Age | Sex | Site |
|---|---|---|---|
| 1 | 48 | M | Thigh |
| 2 | 54 | F | Thigh |
| 3 | 68 | M | Chest wall |
| 4 | 71 | M | Upper limb |

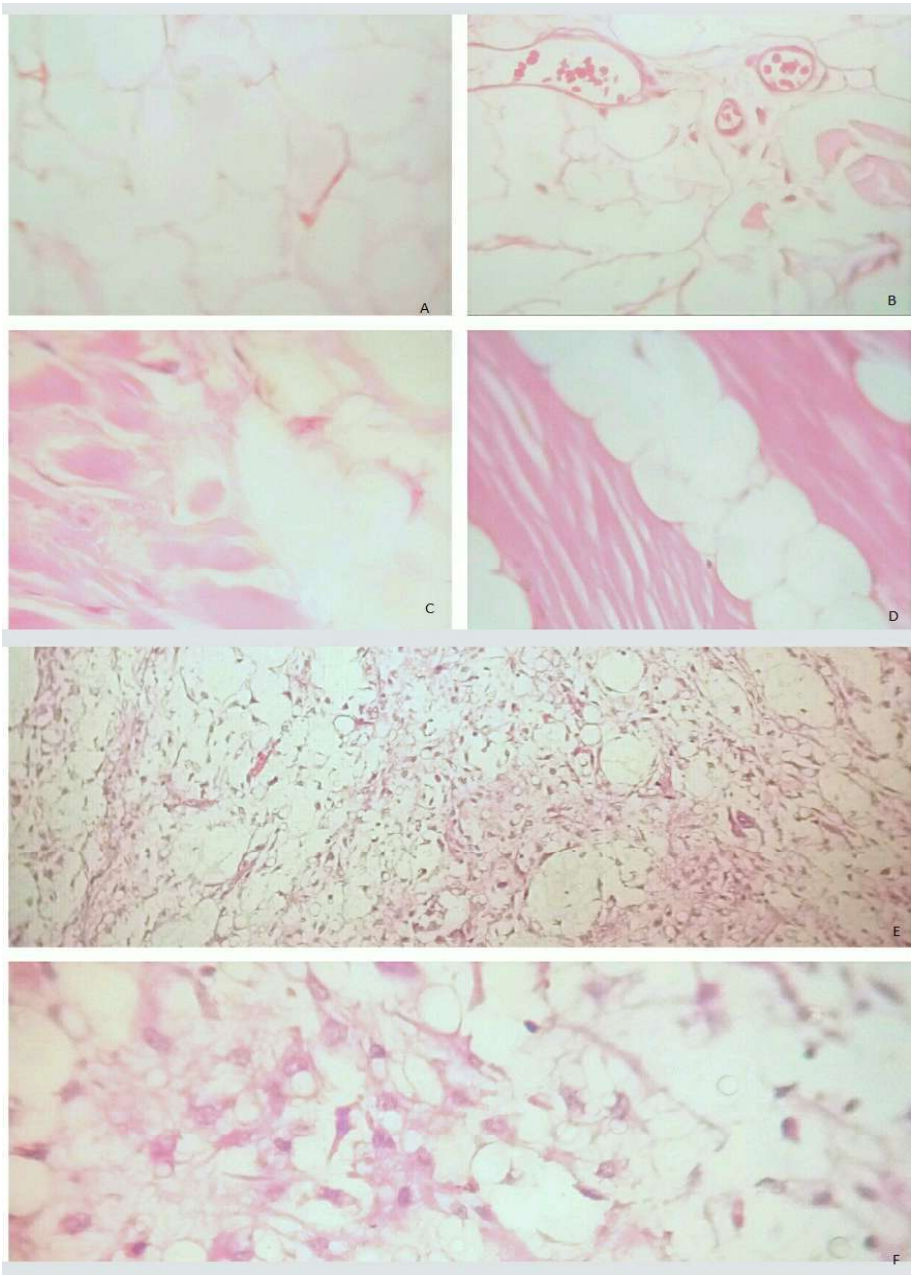


**Fig. 1:** Shows microscopic appearance (40x) of benign adipocytic tumors; (A.) Lipoma, (B.) Angiolipoma, (C.) Fibrolipoma, (D.) Myolipoma (E & F.) Atypical cells and lipoblasts in liposarcoma

## Discussion

Lipomatous tumors form single most largest group in mesenchymal tumors.[1,2] The most of these tumors are benign. According to WHO, adipocytic tumors comes in three subtypes, benign and malignant tumors with an intermediate category.[3]

The commonest adipocytic neoplasm is lipoma (Fig. 1A), which is composed of mature adipose tissue. This is the most common soft tissue tumors accounting for 50% of all mesenchymal tumors. Even though lipomas are commonly seen in subcutaneous fat, rare sites like muscles, synovium or parosteal surfaces can also be involved by these tumors. Lipomas can be superficial or deep, may show regions of nonfat tissue like fibrous tissue (fibrolipoma), cartilage (chondrolipoma), bone (osteolipoma), skeleton muscle (intra/inter muscular lipoma), smooth muscle (myolipoma) etc. common sites involved by superficial lipomas are trunk, shoulders, upper arm, and neck. Deep lipomas commonly affect the large muscles of the lower extremity, trunk and upper extremity[3,4]

Angiolipoma is a benign adipocytic tumor composed of mature adipose cells and branching network of small capillary sized blood vessels (Fig 1B),. These tumors are commonly seen as multiple, tiny, painful nodular lesions located in the forearm, trunk and upper arm. Another common subtype of lipoma is fibrolipoma (Fig. 1C) where adipocytes are separated by dense fibrous tissue in the form of thick fibrous septae.[2,3]

Spindle cell lipoma (SCL), or pleomorphic lipoma, are another variant of lipoma showing replacement of mature adipocytes by spindle cells of differing morphology. Commonly seen in male patients older than 45 years, most of these are located in the posterior neck, shoulder, and upper back. Here in addition to mature fat cells spindle cells show mild to moderate nuclear atypia and hyperchromasia.[5]

Myolipoma or lipoleiomyoma, is a rare tumor composed of mature adipose tissue and smooth muscle cells (Fig. 1D). Myolipoma are typically seen in female in areas like retroperitoneum and abdomen[6]. Intra/intermuscular lipomas show skeletal muscles mixed with adipocytes.[7,8] Chondrolipoma are rare adipocytic tumors commonly seen in females in locations like proximal extremities.[9,10] This tumor as name suggest is composed of mature fat and cartilage in varying proportions.

All these tumors with large amount of fat can develop fat necrosis usually following direct trauma. Fat necrosis can develop as a result of thermal injuries or following autoimmune disorders. Fat necrosis presents clinically as a palpable subcutaneous mass, located over pressure points during imaging studies fat necrosis will resemble areas of liposarcoma.

Well-differentiated liposarcoma/atypical lipomatous tumor is an intermediate grade malignancy that can result in local recurrences but does not usually cause distant metastasis. This tumor is seen in locations like extremities, retroperitoneum, paratesticular region, and mediastinum. Tumor usually present as a painless slow-growing mass in the sixth and seventh decades. Tumor is composed of mature adipose tissue with variably sized adipocytes and bands of fibrous septea containing spindle cells with irregular hyperchromatic nuclei. Morphology varies slightly in subtypes : lipoma like, sclerosing and inflammatory.[11]

Malignant adipocytic tumors are otherwise called liposarcoma. Liposarcoma are seen in elderly population, affecting sites like the deep soft tissues of the extremities, thigh muscles, and retroperitoneum. clinical presentation of liposarcoma is that of an enlarging painless soft tissue mass. Histopathological subtypes include myxoid, round cell or pleomorphic. These tumors are characterized by the presence of large pleomorphic cells mixed with typical lipoblasts with mono vacuolated nucleus (Fig. 1E,F). Liposarcoma shows a high chances of local recurrence and distant metastasis. Unlike other soft-tissue sarcomas, it shows a high incidence of extra pulmonary metastasis to the soft tissues and bones.[12–14]

Dedifferentiated liposarcoma are high-grade sarcoma arising in a primary or recurrent WDLPS/ ALT. These are very aggressive, with high metastatic potential and presents in the seventh decade of life as a painless enlarging mass. The most common location is the retroperitoneum. These tumors show the presence of other high grade soft tissue sarcoma (fibrosarcoma/angiosarcoma) that arises from a well differentiated liposarcoma.[15]

## Conclusion

Being common tumors, lipomatous tumors contribute a major part of routine specimens in any pathology laboratory. Detailed histopathological examination is always recommended not only to confirm the diagnosis, but also to rule out intermediate tumors like well differentiated liposarcoma. Even though immunohistochemistry is having limited role in the diagnosis of lipomatous tumors, molecular studies can be more helpful for which further studies are needed in future.

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