

## Adipocytic Tumours: A review of demographics and histological spectrum in a Tertiary Hospital in North-Central Nigeria

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### Abstract

**Background:** Adipocytic tumours, although frequently found in routine clinical practice, the rare forms may occasionally pose diagnostic challenges. The objective of this study was to evaluate the histological spectrum of biopsies of adipocytic tumours in a tertiary health care centre in north-central region of Nigeria.

**Methods:** A retrospective analysis was performed on archival records, slides and case notes of patients with adipocytic tumours whose biopsy specimens were received and histologically diagnosed in the histopathology laboratory of a regional tertiary hospital in Nigeria.

**Results:** There were 105 cases of patients with adipocytic tumours analyzed. The patients had a mean age of 41.9±15.2 years and a peak frequency in the 30-39 years age group. They comprised of 52 (49.5%) males and 53 (50.5%) females. One hundred (95.2%) cases were benign and five (4.8%), malignant. Lipoma made up 94.4% (n=99/105) of all the cases. Most lipomas were found on the back (15.2%, 15), followed by the thigh (8.1%, 8), neck (7.1%, 7), and buttocks (6.1%, 6). Other

benign adipocytic tumours include fibrolipoma, angioliipoma and spindle cell lipoma. The five malignant tumours present were all liposarcomas (4.8%, n=5/105). The patients with liposarcomas had a mean age of 55±13.8 years. The subtypes of this tumour found include the well differentiated (60%, n=3/5), pleomorphic liposarcoma (20%, n=1/5) and myxoid liposarcoma (20%, n=1/5). Two of the well differentiated liposarcomas occurred at intra-abdominal sites while the three other malignant tumours were superficial. Lipoblastoma and dedifferentiated liposarcoma were not found in this review.

**Conclusion:** The adipocytic tumours were mostly benign lipomas while the cancers formed a very minute proportion.

**Keywords:** Adipocytic tumour; Lipoma; Lipomatous tumour; Liposarcoma; North-central Nigeria

Date received: 25 August 2021; accepted: 10 November 2021

Highland Med Res J 2021;21(2):7-11

### Introduction

Adipocytic tumours, occasionally referred to as lipomatous tumours, are mesenchymal tumours which may arise in diverse locations in the body.<sup>1,2</sup>

These lesions run a gamut from the benign forms of lipoma to the rare variants of liposarcoma.<sup>3</sup> Lipomas are the most common types of adipose tissue tumours.<sup>4</sup> They are composed of mature white fat cells and sometimes mixed with other mesenchymal cellular elements.<sup>5</sup> The lipomatous tumours may be categorised into superficial lipoma, deep lipoma, diffuse or infiltrating proliferation of mature fat and other variants of lipoma.<sup>4</sup> In addition, a lipomatous or adipocytic growth may be hamartomatous or truly neoplastic, a feature unveiled only by histology in many cases. Two general aspects of adipocytic tumours deserve mention. Firstly, these tumours are common in medical practice and hardly present diagnostic difficulty except for the rare forms.<sup>3</sup> The variants of the malignant subtypes may occasionally present difficulties histologically because of shared

characteristics.<sup>3,6</sup> Secondly, they have not been exhaustively discussed in medical literature despite their high frequency.<sup>4</sup> In addition, the increasing recognition of their behaviour has led to modification in classification of these tumours recently.<sup>3</sup> In this research, the histological spectrum and location of adipocytic tumours in a tertiary hospital in north central Nigeria were evaluated.

### Materials and methods

The materials for this research consisted of records of biopsies received in the histopathology laboratory of the Benue State University Teaching Hospital, Makurdi from January 2013 to December 2019 (seven years). Demographic and other relevant information such as age and sex were obtained from the laboratory requisition forms and histology report duplicates. The case folders were retrieved to obtain further information where necessary. The biopsy tissues had been fixed in formalin, processed routinely and embedded in paraffin wax. The paraffin blocks were sectioned at a thickness of about 3-5µ and were stained with routine hematoxylin and eosin. The stained glass slides were viewed with binocular light microscope. All records of biopsies histologically diagnosed as adipocytic tumours were included in this study and those with incomplete records excluded. Classification of the tumours was based on the scheme recommended in 2013 World Health Organisation

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classification of soft tissue tumours and bones.<sup>5</sup>

Statistical analysis of the data was performed with Microsoft Excel, version 16.0 (Microsoft Corporation, Redmond, Washington, USA) and SPSS Statistics, version 25 (IBM Corporation, Armonk, New York, USA). Categorical data such as age, sex and the location of the lesions were analysed with descriptive statistical tools and presented on frequency tables, and proportions were expressed as percentages. The distributions of some of the variables were evaluated using cross tabulation tables.

Ethical approval for this work was granted by the Health Research Ethics Committee of the Benue State University Teaching Hospital, Makurdi (Protocol reference number: BSUTH/CMAC/HREC/101/VI/200; Date: 5<sup>th</sup> March 2020).

**Results**

One hundred and five cases were included in this analysis which comprised of 52 (49.5%) males and 53 (50.5%) females. The age ranged from 6 to 76 years and had a mean of 41.9±15.2 years. Table 1 shows the age distribution of the tumours found in this research. The peak frequency was in the 30-39 years age group. There were eight (7.6%) children (≤19 years) with a mean age of 14.3 ±4.4 years.

One hundred (95.2%) of the cases were benign and five (4.8%) were malignant. The histological types of adipocytic tumours found in this analysis are shown on Table 2. One percent of the benign tumours were formed by nevus lipomatosus superficialis while conventional lipoma, fibrolipoma, angioliipoma and spindle cell lipoma collectively constituted up 94.4% (n=99/105). In the malignant category, the five cases of liposarcoma comprised 4.8% (n=5/105) of all the tumours (Table 2).

Lipoma was slightly more common among females (51, 51.5%) than males (48, 48.5%). The individuals with this condition had a mean age of 41.6±14.7 years. The age frequency of those with lipoma peaked in the 30 – 39 years age group (Table 3). Conventional lipoma constituted the majority (97%, 96/99) of all the forms of lipoma while fibrolipoma, angioliipoma and spindle cell lipoma, each had only one case. Details about the distribution of the lipoma subtypes across the various age groups are presented in Table 3.

The locations of the lipoma growth were specified on the histology requisition form filled by the surgeons following biopsy in 80.8% (n80/99) of the cases but in the remaining 19.2% (n19/99) the site of the biopsied lesion was either not named or vaguely described as a subcutaneous growth. As shown on Table 4, most of the cases of lipoma occurred on the back (15.2%, 15), followed by the thigh (8.1%, 8), neck (7.1%, 7), buttocks (6.1%, 6). The least common locations were eyes, forehead, hand, legs, lips and loins (Table 4). One

patient, a 42 years old female had lipoma at multiple sites (her buttock and back).

The duration of the tumour growth, as ascertained by the patient, prior to presentation was specified in only 31 out of the 99 lipoma cases, ranged from 1 to 15 years and had a mean of 5.2±3.6 years.

The five tumours in the malignant category were liposarcomas and the patient ages ranged from 38 – 76 years with a mean of 55±13.8 years. The peak age group was 50 – 59 years with 3 cases (60%) and 1 case in each of 30 -39 years and 70 – 79 years age groups, respectively. There were three males (60%) and 2 females (40%). The subtypes of liposarcoma found in this research included 3 cases of the well differentiated subtype and a case each of myxoid and pleomorphic subtypes. The locations where these tumours occurred are presented on Table 5. Two of the well differentiated liposarcomas occurred at intra-abdominal locations while the pleomorphic and myxoid liposarcoma cases were located on the neck and shoulder, respectively (Table 5). Lipoblastoma and dedifferentiated liposarcoma were not found in this review.

Table 1: Age distribution of adipocytic tumours

	Frequency	Percent
0-9	2	1.9
10-19	6	5.7
20-29	13	12.4
30-39	27	25.7
40-49	20	19.0
50-59	23	21.9
60-69	10	9.5
70-79	4	3.8
Total	105	100.0

Table 2: Histological types of adipocytic tumours (n=105)

Tumour type	Frequency	Percentage
A. Benign tumours		
i. Hamatomatous		
1. Nevus lipomatosus superficialis	1	1.0
ii. Neoplastic		
2. Lipoma	96	91.4
3. Fibrolipoma	1	1.0
4. Angioliipoma	1	1.0
5. Spindle cell lipoma	1	1.0
B. Malignant tumours		
6. Liposarcoma	5	4.8
Total	105	100.0

Table 3: Age group distribution of lipoma sub-types (n=99)

Age group	Lipoma <sup>†</sup>		Fibrolipoma		Angiolipoma		Spindle cell lipoma		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Sum	%
0-9	0	0.0	0	0.0	1	1.0	0	0.0	1	1.0
10-19	6	6.1	0	0.0	0	0.0	0	0.0	6	6.1
20-29	13	13.1	0	0.0	0	0.0	0	0.0	13	13.1
30-39	26	26.3	0	0.0	0	0.0	0	0.0	26	26.3
40-49	20	20.2	0	0.0	0	0.0	0	0.0	20	20.2
50-59	18	18.2	1	1.0	0	0.0	1	1.0	20	20.2
60-69	10	10.1	0	0.0	0	0.0	0	0.0	10	10.1
70-79	3	3.0	0	0.0	0	0.0	0	0.0	3	3.0
Total	96	97.0	1	1.0	1	1.0	1	1.0	99	100

<sup>†</sup>The expression 'Lipoma' as used here refers to the usual or conventional type. Freq: Frequency. %: percentage

Table 4: Organ and tissue site distribution of lipoma subtypes

Location	Lipoma <sup>†</sup>		Fibrolipoma		Angiolipoma		Spindle cell lipoma		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Sum	%
1 Unspecified <sup>§</sup>	19	19.2	0	0.0	0	0.0	0	0.0	19	19.2
2 Back	14	14.1	1	1.0	0	0.0	0	0.0	15	15.2
3 Thigh	7	7.1	0	0.0	0	0.0	1	1.0	8	8.1
4 Neck	7	7.1	0	0.0	0	0.0	0	0.0	7	7.1
5 Gluteal region	6	6.1	0	0.0	0	0.0	0	0.0	6	6.1
6 Forearm	4	4.0	0	0.0	1	1.0	0	0.0	5	5.1
7 Head	5	5.1	0	0.0	0	0.0	0	0.0	5	5.1
8 Shoulder	5	5.1	0	0.0	0	0.0	0	0.0	5	5.1
9 Chest	4	4.0	0	0.0	0	0.0	0	0.0	4	4.0
10 Breast	3	3.0	0	0.0	0	0.0	0	0.0	3	3.0
11 Scrotum	3	3.0	0	0.0	0	0.0	0	0.0	3	3.0
12 Back of head	2	2.0	0	0.0	0	0.0	0	0.0	2	2.0
13 Face	2	2.0	0	0.0	0	0.0	0	0.0	2	2.0
14 Foot	2	2.0	0	0.0	0	0.0	0	0.0	2	2.0
15 Knee	2	2.0	0	0.0	0	0.0	0	0.0	2	2.0
16 Upper arm	2	2.0	0	0.0	0	0.0	0	0.0	2	2.0
17 Eye	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0
18 Eyelid	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0
19 Finger	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0
20 Forehead	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0
21 Hand	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0
22 Jaw	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0
23 Leg	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0
24 Lips	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0
25 Loin	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0
Total	96	97.0	1	1.0	1	1.0	1	1.0	99	100

<sup>†</sup>The name 'Lipoma' used here refers to the conventional type.

<sup>§</sup>In cases with location categorised as "Unspecified", the site of the biopsied lesion was either not named on the laboratory requisition form or vaguely described as a subcutaneous growth. Freq: Frequency. %: percentage.

Table 5: Organ or tissue site of occurrence of liposarcoma subtypes

Liposarcoma Subtype	Neck	Shoulder	Inguinal region	Intra-abdominal	Total	%
Well differentiated liposarcoma	0	0	1	2	3	60
Pleomorphic liposarcoma	1	0	0	0	1	20
Myxoid liposarcoma	0	1	0	0	1	20
Total	1	1	1	2	5	100

## Discussion

The demographic characteristics of the patients and histological features of the cases found in this study resonate with descriptions provided by various authors who have previously reviewed this category of tumours in various places in Nigeria. In Port Harcourt, females made up 51.3% of the 182 adipose tissue tumours in a report.<sup>7</sup> Similarly, a report of 403 adipocytic tumours in Zaria documented a slight female preponderance of 51.1% (n=206/403).<sup>8</sup> More females were also found in an analysis of 325 adipocytic tumours in Benin-City.<sup>9</sup> These figures are similar to the 50.5% found in this study. The inference from these figures is that although adipocytic tumours are more common in females, the almost equal proportion with males suggests that the patient's gender is a minimal determining factor, if any at all, in the occurrence of these tumours and the observation in these studies may simply be a reflection of the greater anatomical adipose tissue volume in females. Similarly, one study found lack of significant difference in oestrogen and progesterone receptor expression in cells in lipomas when compared with other fat cells from the same sites as the tumour.<sup>10</sup>

Reports show that the ages of patients from some studies peaked in the fifth decade<sup>7,8</sup> unlike in our own study which peaked a decade earlier, in the 30 – 39 years age group. Adipocytic tumours are relatively less common among children. In this study, children constituted only 7.6% similar to 6.5%<sup>8</sup> and 10.9%<sup>9</sup> of adipocytic tumours reported from other studies.

One hundred (95.2%) of the cases were benign and five (4.8%) were malignant in this study. In Benin, 96% benign and 4% malignant cases were found out of the 325 cases reviewed.<sup>9</sup> Similarly, 95.6% benign and 4.4% malignant cases were reported from Port Harcourt.<sup>7</sup> Similar results of exceeding preponderance of benign tumours have also been reported by other authors.<sup>8,11</sup>

Lipoma is well recognised to be the most common adipose tissue tumour.<sup>5</sup> In this study, it was found not only to be the most common but occurred as a solitary tumour at various locations of the body. Superficial or subcutaneous lipoma tends to be more common on the back, neck, shoulder and abdomen.<sup>4</sup> The most common reported site in this research was on the back. Deep lipomas are rare.<sup>4</sup> A conventional lipoma is usually an ovoid soft circumscribed subcutaneous mass which on

cross-section has a yellow greasy surface and lobulated by thin fibrous strands. Histological features of lipoma include the presence of a thin fibrous capsule which delineates the growth from the surrounding tissue; sheets of mature adipocytes, each with a clear voluminous cytoplasm and relatively uniform peripherally displaced nucleus. These cells exhibit only slight variation in shape and size compared with normal adipose tissue.<sup>5</sup> The occasional presence of other mesenchymal components, lends credence to the subtypes of lipoma.<sup>5</sup> In this work, angioliipoma, fibrolipoma and spindle cell lipoma were the subtypes found in addition to conventional lipoma. The occurrence of lipoma in the oral cavity<sup>12-14</sup> and abdominal wall<sup>15-17</sup> has been well reported and reviewed in the medical literature but surprisingly, none was observed in this review.

Although lipomas are mostly solitary, the occurrence of lipoma at multiple sites in an individual, familial lipomatosis, has been rarely reported in the literature.<sup>18</sup> One of the patients in this study was observed to have lipoma at two locations, the buttock and back. Multiple lipomatosis has a familial association and has also been associated with syndromes such as Cowden syndrome,<sup>19</sup> prune-belly syndrome,<sup>20</sup> Fröhlich syndrome, Bannayan-Zonana syndrome<sup>19</sup> and CLOVE (Congenital lipomatous overgrowth, vascular malformations, and epidermal nevi) syndrome.<sup>21</sup>

Only a small portion of the adipocytic tumours were recorded in the breast. In this study it constituted only 3% and they were all lipomas. Our observation is congruent with the 4% recorded in Zaria,<sup>8</sup> but higher than the 0.7% from Kano<sup>22</sup> and 0.3% in Abakaliki,<sup>23</sup> all depicting the rarity of this condition despite the abundance of adipose tissue in the breast.

Myxoid adipocytic tumours encompass a broad range of tumours which have a typical myxoid appearance. These tumours include myxoid liposarcoma, lipoblastoma, pleomorphic liposarcoma, chondroid lipoma, spindle cell lipoma, dedifferentiated liposarcoma.<sup>24</sup> Only one case of myxoid liposarcoma was found in this study. Lipoblastoma, a rare type of adipocytic tumour was not seen among the tumours reviewed, but this tumour has been reported to mimic myxoid liposarcoma histologically; and a careful examination and immunohistochemistry may be required to differentiate between the two conditions.<sup>6</sup>

The other two malignant adipocytic tumours found include pleomorphic liposarcoma and well differentiated liposarcoma.

The broad concurrence of the findings of this study with reports from other places suggests insignificant differential environmental influences.

### Conclusion

This was a seven year retrospective analysis of histologically diagnosed adipocytic tumours in a health centre located in north-central Nigeria. The most frequently encountered tumours were the benign lipomas. The malignant ones included subtypes of liposarcoma which constituted a very minute proportion of the adipocytic tumours.

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