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# Benign soft tissue tumours: analysis and histopathological study of 2,213 cases in an indigenous black African population

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**Abstract**

*Aims and objectives*: The aim of this retrospective study was to determine the pattern of benign soft tissue tumours in a tertiary hospital based histopathology service in South-western Nigeria.

*Materials and method:* The records of all benign soft tissue tumours diagnosed in the Department of Pathology, University College Hospital, Ibadan, between January 1970 and December 2002 were retrieved, and reclassified using the 2002 World Health Organization classification of soft tissue tumours. The sites of lesions were coded into five categories: upper extremity, lower extremity, head and neck, trunk and abdomen. Clinical information obtained included age, gender, histopathological diagnosis, recurrence and presence of multiple lesions. All cases where any of this information,was not available were excluded from the study.

*Results*: Two thousand two hundred and thirteen (2213) cases fulfilled the inclusion criteria out of 2801 cases retrieved from the records of the department. They comprised adipocytic tumours (accounting for 55.5%), vascular (24.5%), fibroblastic/ myofibroblastic (9.4%), fibrohistiocytic (8%), smooth muscle (0.9%), perivascular/pericytic (1.2%), chondro-osseous (0.1%) and tumours of uncertain differentiation (0.4%). Overall male: female ratio was 1:1. The age range was from 5months to 83 years, with peak age group of 30-39 years in males and 20-29 years in females.

*Conclusion:*This study shows a similar pattern of benign soft tissue tumours in our series to what obtains in other parts of the world, although our patients tended to be younger, a reflection of the population structure of our country. However, in contrast to Caucasian series, deep fibromatosis was observed to be far more common than superficial fibromatosis. Also giant cell tumour of tendon sheath has a slight male predominance in contrast to overwhelming female predominance in other series.

**Keywords:** *Benign, soft tissue, black African*

**Résumé**

Le but de cette étude rétrospective était de déterminer la fréquence des tumeurs bénignes des tissues doux dans un centre tertiaire base sur le service histopathologique au sud-ouest du Nigeria. Les registres de tous les tumeurs bénignes des tissues doux diagnostiqués au département de pathologie, Centre Universitaire Hospitalier, Ibadan, Nigeria entre janvier 1970 à Décembre 2002 étaient retires, reclassés utilisant la classification de l'OMS des tumeurs des tissues doux. Les sites des lésions étaient codés en cinq catégories : extrémité supérieur, extrémité inferieure, la tête et le cou, le tronc et l'abdomen. Les informations cliniques obtenues inclues: l'âge, le genre, le diagnostic histopathologique, la récurrence et la présence des multiple lésions. Tous les cas ou aucune information a l exception de la récurrence et des multiple lésions, étaient exclus de cette étude. Deux mille deux cent trente un (2231) cas obéissaient aux critères inclusion des 2801 cas retirés des registres du département. Ils étaient constitués de tumeurs adipocytiques (estimant à 55.5%), vasculaire (24.5%), fibroblastique/myofibroblastique (9.4%), fibrohistiocytique (8%), muscle lisse (0.9%), perivasculaire/pericytique (1.2%), chondro-osseuse (0.1%) et tumeurs à différentiation incertaines (0.4%). La proportion totale male: femelle était de 1:1. La variation d'âge était de 5mois à 83 ans, avec un sommet d'âge entre 30-39 ans chez les hommes et 20-29 ans chez les femmes. Cette étude montre une fréquence similaire des tumeurs bénignes des tissues doux dans cet environnement comparé aux résultats d'autres parties du monde, bien que nos patients sont plus jeune, une réflexion de la distribution de la population de notre pays. Cependant chez les européens, la fibromatose profonde était observé plus commun que celle superficielle.

## Introduction

Benign soft tissue tumours are relatively common in clinical practice. They are a large and heterogeneous group of neoplasms, which can be found in virtually any location in the human body [1,2]. These tumours

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may arise from soft tissue, skin, subcutis or various other organs . They show a broad range of differentiation, such as adipocytic (lipoma), smooth muscle (leiomyomas) or fibroblastic (e.g. fibromas). Most attention, as indicated in literature, has been devoted to the study of the malignant forms, despite the fact that benign soft tissue tumours may be as much as 100 times more common than the malignant variants [3]. Published data on benign soft issue tumour from our environment is limited but single entity or individual tumour studies are common.

Although there are divergent opinions regarding the definition of what constitutes a soft tissue tumour, the 2002 World Health Organization classification of soft tissue tumours has a relatively high degree of acceptance [4,5]. There are no strong aetiological factors associated with the development of benign soft tissue tumours, but some types such as fibromatosis, lipomas and leiomyomas, are known to occur with clustering in families [1,6]. There is no significant racial predilection in benign soft tissue tumours [1,4,7].

Population studies of soft tissue tumours are extremely rare in literature. In 1981 Myhre-Jensen in one of the very rare population based studies of soft tissue tumours reported an incidence of about 300 per 100,000 population for soft tissue tumours in the Scandinavia [8]. Many benign soft tissue tumours such as lipoma and haemangioma, will go unbiopsied unless cosmetically unacceptable to the patient, hence direct application of data derived from hospital series will be inappropriate for the general population [1,4,9].

This study sets out to determine the demographic pattern, relative rate of occurrence and histological pattern of benign soft tissue tumours at the University College Hospital, Ibadan, over a 33 year period.

## Materials and method

The records of all benign soft tissue tumours histologically diagnosed in the Department of Pathology, University College Hospital, Ibadan, Nigeria, over a period of thirty-three years from January 1970 to December 2002 were retrieved, reviewed and reclassified based on the 2002 World Health Organization (WHO) classification of soft tissue tumours [4]. Only tumours arising from soft tissues and specifically the cutaneous, subcutaneous and deep forms of benign fibrous histiocytoma were included in the fibrohistiocytic category. Tumours arising from organ specific locations were excluded in this study, because, the strict definition of soft tissues does not take these sites into consideration. However, abdomino-pelvic, retroperitoneal, chest and abdominal wall lesions are included; so far they do not originate from specific organ site. Lesions were coded to 24 anatomical locations, but for the purpose of analysis they were placed in one of five categories: upper extremity, lower extremity, head and neck, trunk and abdomen.

The site of lesion, patient's age, gender, histopathological diagnosis, and presence of recurrence or multiple lesions in individual patients were coded and entered into a computer data base using the EPI-INFO (http://www.cdc.gov/epiinfo) software. All cases where any of these information, except for recurrence or multiple lesions, was not available were excluded from the study.

**Table 1**: Major categories of benign soft tissue tumours

| Tumour | Number | % |
|---|---|---|
| Adipocytic | 1229 | 55.5 |
| Vascular | 542 | 24.5 |
| Fibroblastic/ myofibroblastic | 208 | 9.4 |
| Fibrohistiocytic | 177 | 8.0 |
| Smooth muscle | 19 | 0.9 |
| Perivascular/ pericytic | 27 | 1.2 |
| Chondro-osseous | 2 | 0.1 |
| Uncertain differentiation | 9 | 0.4 |
| Total | 2213 | 100 |

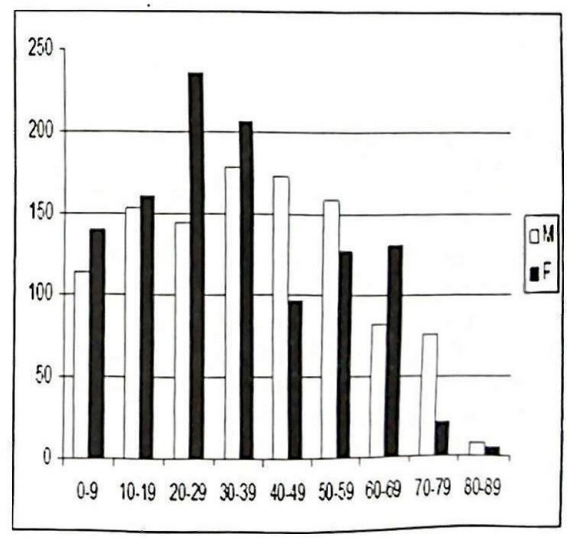


**Fig.1**: Age distribution of patients with benign soft tissue tumours

## Result

A total of 2,213 cases had complete data and fulfilled the inclusion criteria for this study out of the 2,801cases from the records and files of the

**Table 2-** Frequency distribution, gender ratio and age distribution of benign soft tisuue tumours

| Tumour group | Number of cases | Percent | M:F | Age Range (yrs) | Mean Age (yrs) |
|---|---|---|---|---|---|
| *Adipocytic* | 1229 | 55.5 | 1:1 | 1-83 | 43 |
| Lipoma/ fibrolipoma | 1171 | 52.9 | | | |
| Hibernoma | 16 | 0.7 | | | |
| Lipomatosis | 18 | 0.7 | | | |
| Myolipoma | 7 | 0.3 | | | |
| Chondrolipoma | 2 | 0.1 | | | |
| Angiolipoma | 27 | 1.2 | | | |
| Intramuscular lipoma | 6 | 0.2 | | | |
| Angiomyolipoma | 8 | 0.4 | | | |
| *Vascular* | 542 | 24.5 | | | |
| Capillary haemangioma | 347 | 15.7 | 1:1.0 | 6mths- 72 | 21 |
| Cavernous haemangioma | 73 | 3.3 | 1:1.1 | 6mths-70 | 14 |
| Lymphangioma | 94 | 4.2 | 2:1.0 | 5mths-50 | 10 |
| Epithelioid haemangioma | 28 | 1.3 | 1.3:1 | 10-65 | 25 |
| *Fibroblastic/ myofibroblastic* | 208 | 9.4 | | | |
| Fibromatosis | 120 | 5.4 | 2:1 | 7-69 | 20 |
| Nuchal-type fibroma | 30 | 1.4 | 1.5:1 | 30-49 | 39 |
| Fibroma of tendon sheath | 14 | 0.6 | 1:2.0 | 27-40 | 34 |
| Nodular fasciitis | 44 | 2.0 | 1:3.0 | 24-60 | 50 |
| *Fibrohistiocytic* | 177 | 8.0 | | | |
| Benign fibrous histiocytoma | 88 | 4.0 | 1:1.3 | 12-45 | 32 |
| Giant cell tumour of tendon sheath | 65 | 2.9 | 1.2:1 | 11-70 | 34 |
| Diffuse type giant cell tumour | 24 | 1.1 | 2:1.0 | 18-60 | 40 |
| *Smooth muscle* | 19 | 0.9 | | | |
| Deep leiomyoma/Angioleiomyoma | 19 | 0.9 | 1:1 | 30-50 | 45 |
| *Perivascular/pericytic* | 27 | 1.2 | | | |
| Glomus tumour and its variants | 27 | 1.2 | 1:1 | 5mths-50 | 29 |
| *Chondro-ossseous* | 2 | 0.1 | | | |
| Soft tissue chondroma | 2 | 0.1 | 1:1 | 34-44 | 39 |
| Uncertain differentiation | 9 | 0.4 | | | |
| Juxta articular myxoma | 3 | 0.1 | 2:1 | 24-45 | 35 |
| Deep aggressive angiomyxoma | 6 | 0.3 | 0:6 | 25-55 | 36 |

**Table 3:** Site distribution in percentages of some benign soft tissue tumours in UCH, Ibadan

| Tumour | Upper limb | Lower limb | Trunk | Head and neck | Abdo-men | Total (%) |
|---|---|---|---|---|---|---|
| *Lipomatous* | 19 | 16 | 38.1 | 26.2 | 0.7 | 100 |
| *Vascular* | | | | | | |
| Capillary haemangioma | 13 | 14 | 20 | 53 | - | 100 |
| Cavernous haemangioma | 12 | 12 | 4.6 | 70 | 1.4 | 100 |
| Lymphangioma | 10 | - | 18 | 70 | 2 | 100 |
| Epitheloid haemangioma | 15 | 15 | 5 | 65 | - | 100 |
| *Fibroblastic/ myofibroblastic* | | | | | | |
| Fibromatoses | 15.8 | 31.6 | 32.1 | 10.5 | 10 | 100 |
| Fibroma of tendon sheath | 5 | 25 | 5 | 65 | - | 100 |
| *Fibrohistiocytic* | | | | | | |
| Benign Fibrous Histiocytoma | 12.5 | 12.5 | 37.5 | 37.5 | - | 100 |
| Giant cell tumour of tendon sheath | 67 | 33 | | | | 100 |
| *Perivascular/Pericytic* | | | | | | |
| Glomus tumour and its variants | 55 | 20 | 5 | 20 | - | 100 |
| *Smooth Muscle* | | | | | | |
| Leiomyoma | - | 50 | - | 50 | - | 100 |

department of Pathology, University College Hospital Ibadan. The tumours were classified into 8 histological groups. Table 1 shows the number of cases and percentages for each category of tumour. Adipocytic, vascular, fibroblastic/myofibroblastic and fibrohistiocytic tumours constituted over 97% of these lesions. Overall, females represented 50.9% of patients in this study, while the rest were males, giving an approximate male: female ratio of 1:1. The age range was 5months to 83 years, with peak age

group of 30-39 years in males and 20-29 years in females as shown in Figure 1. Table 2 shows the detailed frequency distribution, male to female ratio, age range and mean age for each tumour group and subgroup. Table 3 shows the most common tumours in this series with their site distribution and location. Multiple biopsies from the same site of initial lesion were found in 146 cases, which were either from patients with an initial incisional and later a definitive excisional biopsy specimen, or from recurrences at the same primary site. These cases were counted only once so as not to give a falsely increased rate for such lesions. In addition, multiple anatomically distinct lesions were seen in 20 patients; with 12 patients having two lesions, six having three lesions and two having four lesions. These multiple lesions were seen in patients with diagnosis of lipomatosis.

## Discussion

The pattern of benign soft tissue tumours observed in this study is similar to those described in other parts of the world. Benign soft tissue tumours are usually associated with very low risk of recurrence after adequate surgical excision. The few recurrences observed in this study we have assumed were probably due to inadequate surgical excision and not a "new tumour" entirely. Single studies devoted to all benign soft tissue tumours are very few but those of individual tumour types are quite common. The classification of soft tissue tumours has undergone many changes but the 2002 WHO classification appears globally acceptable and has been utilised for the purpose of this study. This is to allow for good comparison with studies from other investigators.

The peak age occurrence in this study was in the third and fourth decades of life in females and males respectively. This may reflect a relative younger population in the environment where we practice. The overall approximate equal male: female ratio of 1:1 supports previous studies from the North central region of Nigeria, Denmark, United States and Thailand [8,10-12].

Lipomas were the most common tumours in this study accounting for more 55% of the cases. This supports the general trend in the literature that lipomas are the most common mesenchymal neoplasm constituting about 30-50% of all benign soft tissue tumours [8,10-12]. Lipomas generally occurred most frequently in the fifth and sixth decades as we have found in this study and is common in obese individuals [1,13,14]. Rydholm and Berg estimated the annual clinical incidence of lipoma to be about 1 in 1000 [14]. Specific histological variants of lipomatous neoplasms such as hibernoma, myolipoma, chondrolipoma and angiomyolipoma were not commonly seen in the present study.

Vascular tumours were the second most common tumours in this study constituting 24.5% of cases. It is often difficult to determine whether benign vascular lesions (haemangiomas and lymphangiomas) are malformations, true neoplasms or reactive processes [4]. Capillary and cavernous haemangiomas and lymphangiomas are considered to be hamartomas by some authorities and as true neoplasms by others.

Haemangiomas (capillary and cavernous types) are very common in children. We found in our series that over 90% of cases were in children less than 15 years of age. This is close to the figure of 85% in the report of paediatric vascular neoplasms by Rafindadi and Malami in Zaria, Nigeria [15]. The preponderance for the head and neck region in this study is comparable to findings documented by Rafindadi from Zaria, Nigeria, and Weiss and Goldblum from their experience in the United States [1,16].

Lobular capillary haemangiomas are polypoid tumours occurring in the skin and mucosal surfaces, usually with ulceration and associated inflammation [1]. Uncomplicated cases lack these two features and are quite similar to ordinary capillary haemangiomas, except for their distinct gross appearance and clinical features [1]. The current nomenclature regarding lobular capillary haemangioma encompasses the old designation of pyogenic granuloma, the use of which is still very common among clinicians. The findings of greater than 50% of cases occurring in the head and neck region close to mucosal surfaces, as well as the approximately equal male to female ratio and affecting all ages supports the findings of Kerr in an original description of the lesion and by Gordón-Núñez from Brazil [17,18].

Lymphangiomas in this series occurred as early as 6 months of life, with a mean age of 10 years. This finding supports the notion that they are developmental malformations, with genetic abnormalities playing an additional role, like in Turner's syndrome where they may be congenital, or develop during the early years of life [4,18,20]. In this study the majority of cases, occurred in head and neck or axilla, and this is comparable to those of Alqahtani et al from the United States and Rafindadi from Zaria, Nigeria [16,21].

The fibroblastic and myofibroblastic category represent a very large diverse group of distinct entities that differ greatly in behaviour [4] and were the third most common in this study and

accounting for 9.4% of the cases. The mean age of patients with fibromatosis was 20 years in this study mimicking the findings in other parts of the world [22-25]. The superficial fibromatoses are much more common than deep fibromatoses in Caucasian populations [22]. They are most common in Northern Europe and those parts of the world inhabited by people of Northern European extraction [24]. There were only 25 cases of plantar or palmar fibromatosis in this series and this may support the suggestion that these lesions are quite rare in non-Caucasian populations [23]. However, the deep fibromatoses predominated in the present study, accounting for 115 (82.1%) of the cases of fibromatoses seen. Most of these were located in the abdominal wall. Fibromas in this study were located mainly in the head and neck (65%), mainly in the posterior neck region (nuchal) and in other locations like the extremities. This finding is similar to that of Michal *et al* [26]. Since extranuchal lesions are histologically indistinguishable from nuchal examples, Michal *et al* have proposed the designation nuchal-type fibroma to encompass all histologically alike lesions irrespective of their origin [26].

In the fibrohistiocytic group, the benign fibrous histiocytomas constituted 89% of cases. The mean age of 32 years and the almost equal distribution between the head and neck, trunk and extremities in this study, is comparable to the findings of Ihekwaba *et al* from an earlier study in Ibadan, Nigeria [27]. However the sex ratio is marginally skewed toward females in this study unlike other studies which show predominance in males [27]. Giant cell tumour of tendon sheath showed a 1.3:1 marginal male predominance in this study unlike the findings of up to 2:1 female predominance in other studies [28,29]. However, the mean age of 34 years in this study is similar to the distribution in the Japanese series of Ushijima *et al* [29] and the Caucasian series of Monaghan *et al* [30]. The overwhelming predominance of occurrence in the fingers of the upper limb is comparable to findings in these other studies as well.

In conclusion benign soft tissue tumours are fairly common in our environment. This study shows a similar pattern of benign soft tissue tumours in our cases to what occurs in other parts of the world, although our patients tend to be younger, a reflection of the population structure of our country. In contrast to Caucasian series, deep fibromatosis were observed to be far more common than superficial fibromatosis. Further studies need to be done in other to further characterise these lesions at the molecular level so as to confirm and possibly explain the racial differences.

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