OSTEOCHONDROMA: A 15 YEAR REVIEW OF ITS DEMOGRAPHICS AT THE JOS UNIVERSITY TEACHING HOSPITAL IN NORTH CENTRAL NIGERIA

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ABSTRACT

Background/Aims: Osteochondroma is the most common bone tumour worldwide, most cases present as a painless bony protrusion that poses minimal risk to the patient with very few undergoing malignant transformation. This study is aimed at documenting the demographics of Osteochondroma in a tertiary health care Centre in North Central Nigeria. The gender distribution, age distribution and site of diagnosis were documented.

Methods: This is a hospital based retrospective study which assesses all cases of osteochondroma diagnosed at the Department of Histopathology, Jos University Teaching Hospital, Jos Plateau State North-Central Nigeria between 1st January 2005 to 31st December 2019. Records of all cases of primary bone tumour within the period of the study were reviewed and percentages were calculated for osteochondroma. The Age, Sex and Anatomical site of osteochondroma diagnosis were recorded. Slides were reviewed to confirm the diagnosis.

Results: A total 165 primary bone tumours were documented in the period of review of which 103 were benign and 62 malignant. There were **28 cases of Osteochondroma** (which accounted for 17% of primary bone tumours and 27% of benign bone tumours). Forty six percent of cases occurred in the second decade and it had a male to female ratio of (M:F) 0.86:1. Sixty percent (60%) of cases occurred in the femur, tibia and humerus combined.

Conclusion: The demographics of osteochondroma at the Jos University Teaching Hospital correlates with reports from similar institutions in other parts of Nigeria and other parts of the world.

KEYWORDS: Osteochondroma; Primary bone tumour; Benign bone tumour; Jos, Nigeria

INTRODUCTION

Osteochondroma is the most frequently occurring benign bone tumour globally.[1-4] Its reported frequency of occurrence varies from place to place. It is estimated to account for between one-third to a half of primary bone tumors diagnosed in some studies.[4] Osteochondroma is commonly diagnosed in young individuals. [1,2] The long bones of the upper and lower limbs are the commonest sites of its diagnosis.[1] Osteochondroma can occur as a solitary lesion and in the setting of a hereditary syndrome with multiple osteochondromas.[4,5] Histologically these tumours consist of a bony projection with a cartilage cap.[1,2] Osteochondromas have a predominant bony portion, but their growth occurs in the cartilaginous portion hence its classification as a chondrogenic tumour.[5]

MATERIALS AND METHODS

This study is a retrospective review of all cases of osteochondroma diagnosed at the Jos university Teaching Hospital (JUTH) department of Histopathology between 1st January 2005 to 31st December 2019. Materials utilized for this research consisted of Archival slides, paraffin wax tissue blocks, surgical pathology register and case files of all cases of osteochondroma diagnosed during this period. The patient age at diagnosis, gender and anatomical site/bone affected by the tumour were documented for each case. All cases of primary bone tumour were reviewed and relevant percentages for osteochondroma were calculated. All cases were reviewed by the authors of this article, this was done by reviewing archival slides and fresh sections from paraffin wax tissue blocks in cases of missing or poor quality slides. Data obtained was analyzed utilizing Epi info 7 (version 3.5.4) and presented in tables and charts.

RESULTS

A total 165 primary bone tumours were documented in the period of review of which 103 were benign and 62 malignant. There were **28 cases of Osteochondroma** (which accounted for 17% of primary bone tumours and 27% of benign bone tumours). Osteochondroma and fibrous dysplasia were the commonest benign bone tumours diagnosed during the period of this review and each accounted for 27% of primary benign bone tumours. Osteochondroma had a slight female predominance with a male to female ratio 0.86:1 (figure 1). The peak age range of diagnosis is the second decade with a mean age of 23 ±16years (table 1).The commonest sites of osteochondroma diagnosis were the tibia, femur and humerus (table 2). A photomicrograph of one case of osteochondroma is provided below (figure 2)

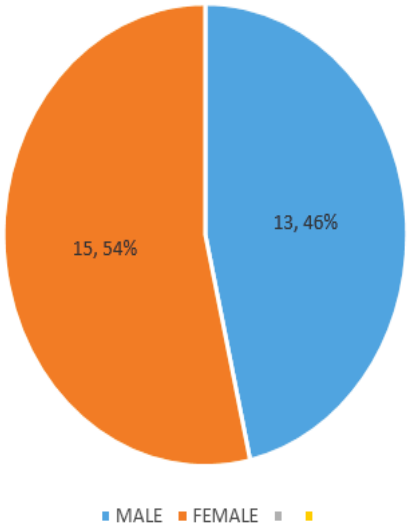

Figure 1:. Chart showing gender distribution of osteochondroma

Table 1. Table showing distribution of osteochondroma cases according to age (stratified into decades)

S/N	AGE RANGE	Frequency	Percentage
1	0-10	4	14.3
2	11-20	13	46.4
3	21-30	6	21.4
4	31-40	1	3.6
5	41-50	1	3.6
6	51-60	2	7.1
7	>60	1	3.6
TOTAL		28	100

Table 2. Table showing distribution of osteochondroma according to anatomical site of diagnosis

S/N	SITE OF TUMOUR	Frequency	Percentage
1	Femur	4	14.3
2	Fibula	1	3.6
3	Foot	3	10.7
4	Hand	2	7.1
5	Humerus	6	21.4
6	Radius	1	3.6
7	Rib	1	3.6
8	Scapula	2	7.1
9	Tibia	7	25
10	Ulna	1	3.6
	TOTAL	28	100

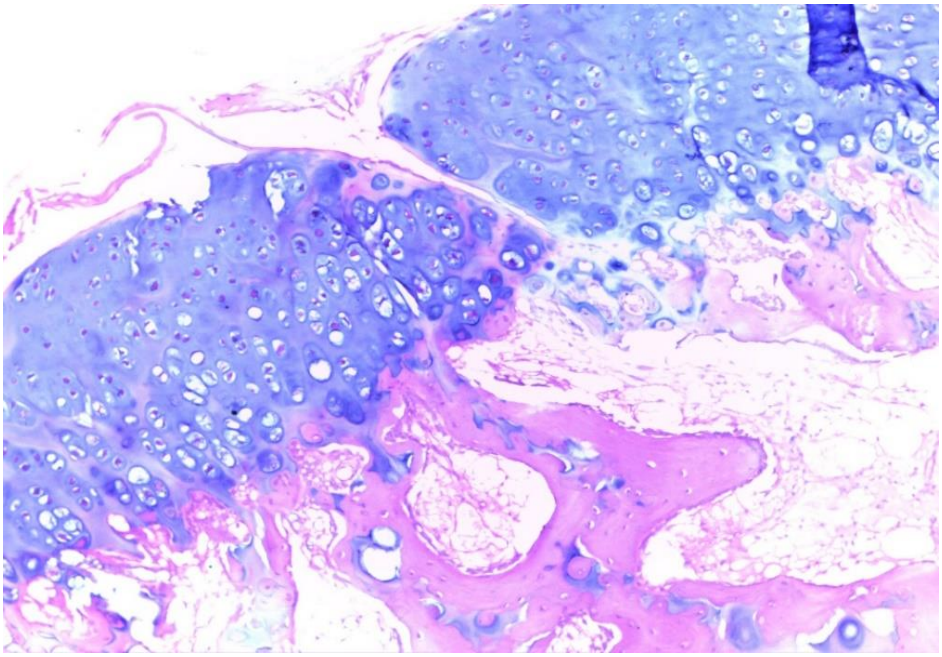

Figure 2. Photomicrograph (**Haematoxylin and eosin x 100**) Osteochondroma of the tibia in an 11-year-old male. Perichondrium, cartilage and bone are clearly demonstrated.

DISCUSSION

Authors opined in the past that osteochondroma is not a true neoplasm but rather a skeletal dysplasia,[4,5] however molecular studies suggest osteochondroma is a neoplastic process.[4] Cytogenetic studies have revealed that abnormalities involving loci 8q24.1, 11p11.2-12 and 19p are involved in the pathogenesis of solitary and multiple osteochondromas and the genes involved are denoted as EXT1(8q24.1), EXT2(11p11.2-12) and EXT3(19p) respectively.[4] Eighty five percent (85%) of all osteochondromas occur in the solitary form with 15% occurring in the setting of multiple osteochondromas.[3,5] Cases of hereditary osteochondromas appear to be more common in Caucasians than other races.[3] We did not document any case of multiple osteochondromas in our study.

Osteochondroma accounted for 17% of primary bone tumours and 27% of benign bone tumours in this study. It is the second most common primary bone tumour after osteosarcoma and the most common benign bone tumour (along with fibrous dysplasia). Our findings correlate closely with the report by Mohammed et al in Zaria North-western Nigeria, in which osteochondroma accounted for 26% of benign bone tumours.[6] Abdulkareem et.al in Lagos South-western Nigeria and Lasebikan et al in Enugu South-eastern Nigeria also documented osteochondroma as the commonest benign bone tumour but reported significantly higher percentages of 55.7% and 44.7% respectively.[7,8] Osteochondroma was also documented as the commonest benign bone tumour in reports from diverse geographical locations such as Ethiopia (41%), Cameroon (20%), India (40.5%), Mexico (43.7%) and Portugal (45.3%) with varying percentages.[9-13] The relatively low documented percentage of osteochondroma in our study compared to widely reported literature may be attributed to sociodemographic factors in the local population leading to a lower percentage of cases detected and resected.[1,14,15]

Osteochondroma was slightly more common in the female gender in this study with a male to female ratio (M:F) of 0.86:1, Lasebikan et al in Enugu south-eastern Nigeria also documented a female predominance (M:F 0.9:1).[8] A male predominance of osteochondromas appears to be the norm in most local and international publications.[1,2,6,7,9] Some authors have however argued that a gender bias of this tumour does not exist.[5] Reasons for a higher incidence in females in this study can only be speculative. A difference in health seeking behavior among the genders in the local population or less likely biological factor may be responsible but cannot be substantiated from this study.

Osteochondroma is a tumour of children and adolescents.[3,5] A majority of cases of osteochondroma in this study occurred in the first three decades with the peak period of diagnosis in the second decade (46% of cases occurred between 11-20 years). Reports from other parts of Nigeria also documented a peak in the second decade, with 44%, 66% and 75% diagnosed in the second decade in Lagos, Enugu and Zaria respectively.[6,7,8] Elsewhere Bamanikar et al in India documented 60.7% of cases in the second decade.[9] Globally most cases are diagnosed in the first three decades of life.[1]

Osteochondroma can affect any bone in the body but commonly affects long bones of the appendicular skeleton such as the femur, tibia and humerus, it less commonly affects flat bones such as the scapular and hip bones.[3,5] The commonest sites of osteochondroma diagnosis in this study were the long bones, tibia (25%), humerus (21.4%) and femur (14.3%). Studies from Lagos and Enugu in Nigeria also documented similar sites of osteochondroma diagnosis.[7,8] In Zaria North-western Nigeria the face was the most common site of osteochondroma diagnosis, this is however an unusual finding.[6,16] Globally the commonest bones of osteochondroma diagnosis are the femur, humerus, tibia and fibula.[1]

Many cases of osteochondroma are asymptomatic and are detected incidentally[1] however a feared complication is the rare malignant transformation to chondrosarcoma, other complications include formation of vascular pseudoaneuryms and nerve compression arising from an osteochondroma

impinging on the aforementioned structures.[5] Indicators of malignant transformation include rapidly increasing size, pain in a previously painless lesion and continued growth of an osteochondroma after skeletal maturity.[5] Osteochondroma (especially the hereditary multiple osteochondromas) is the commonest precursor lesion for secondary chondrosarcoma, it occurs at a younger age than in patients with primary chondrosarcoma.[3] The risk of chondrosarcoma transformation is highest in pelvic bone osteochondromas and those with a thick cartilage cap.[3] Treatment of osteochondroma is simple surgical excision and is dependent on the presence and type of symptoms.

CONCLUSION

The demographics of osteochondroma seen at the Jos University Teaching Hospital is similar to findings in other local and international published data.

CONSENT

Is not applicable (no patient identifiers)

ETHICAL APPROVAL

Not applicable

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COMPETING INTERESTS

Authors of this article declare that there are no competing interests

REFERENCES

1. Bovee JVMG, Heymann D, Wuyts W. Osteochondroma. In: Fletcher CDM, Bridge JA, Hogendoorn PCW, Mertens F. eds. WHO Classification of tumours of soft tissue and bone. 4th ed. Lyon: IARC press; 2013:250-251.

2.Horvai A. Bones, Joints and soft tissue tumours. In: Kumar V, Abbas AK, Aster JC. Eds. Robins and Cotran Pathologic basis of disease. 9th ed. Philadelphia: Elsevier Saunders; 2015:1180-1226.

3 Kitsoulis P, Galani V, Stefanaki K, Paraskevas G, Karatzias G, Agnantis NJ et al. Osteochondromas: Review of the clinical radiological and pathological features. In vivo 2008;22:633-646

4 Porter DE, Simpson HRW. The neoplastic pathogenesis of multiple and solitary osteochondromas. J Pathol 1999;188:119-125.

5.De Sousa AMG, Bispo Junior RZ. Osteochondroma: ignore or investigate? REV BRAS ORTOP. 2014;49(6):555-564.

6. Mohammed A, Isa HA. Patterns of primary tumours and tumour-Like lesions of bone in Zaria, Northern Nigeria: A review of 127 cases. WAJM. 2007;26(1):37-41.

7.Abdulkareem FB, Eyasan SU, Akinde OR, Ezembakwe ME, Nnodu OE. Pathological study of bone tumours at the National Orthopaedic Hospital, Lagos, Nigeria. WAJM 2007;26(4):306-11.

8.Lasebikan OA, Nwadinigwe CU, Onyegbule EC. Pattern of bone tumours seen in a regional Orthopaedic Hospital in Nigeria. NJM. 2014;23(1):46-50.

9.Bamanikar SA, Pagaro PM, Kaur P, Chandanwale SS, Baminakar A, Buch A. Histopathological study of primary bone tumours and tumour-like lesions in bone. JKIMSU. 2015;4(2):46-55.

10.Negash BE, Admasie D, Wamisho B, Tinsay M. Bone tumors at Addis Ababa University, Ethiopia: Agreement between radiological and histopathological diagnosis, a 5 year analysis at black-lion Teaching Hospital. IJMMS 2009;1 (4):119-25.

11.Bahebeck J, Atagana R, Eyenga V, Pisoh A, Sando Z, Hoffmeyer P. Bone tumours in Cameroon: incidence, demography and histopathology. International Orthopaedics (SICOT) 2003; 27:315-17.

12.Baena-Ocampo LC, Ramirez-Perez E, Linares-Gonzalez LM, Delgado-chavez R. Epidemiology of bone tumors in Mexico City: retrospective clinicopathologic study of 566 patients at a referral institution. Ann Diagn Pathol 2009; 13(1): 16-21.

13.Barbosa CS, Araujo AB, Miranda D. Incidence of primary benign and malignant neoplasms and bone pseudotumoral lesions. An epidemiologic analysis of 585 cases diagnosed at Faculdade de Medicina of the Universidade Federal de Minas Gerias. AMB Rev Assoc Bras 1991; 37(4):187-92

14. Ihaji E, Gerald EU, Ogwuche CHE. Educational level, Sex and Church affiliation on health seeking behaviour among parishioners in Makurdi metropolis of Benue state. JEPER. 2014;1(2):311-16.

15. Ogunlesi TA, Olarenwaju DM. Sociodemographic factors and appropriate health care seeking behavior for childhood illnesses. Journal of tropical pediatrics. 2010;56(6):379-385.

16.Kishore DN, Kumar HRS, Umashankara KV, Rai KK. Osteochondroma of the mandible: a rare case report. Case reports in pathology, vol. 2013. Article ID 167862, 3 pages, 2013. .http://dx.doi.org/10.1155/2013/167862