

Clinicopathological Study of Lesions of Bone - A Hospital-Based Study

Prasanta Kumar Das¹, Bidyut Dutta², Jabin Musfique³, Partha Pratim Das⁴

¹Department of Orthopaedics, Fakhruddin Ali Ahmed Medical College and Hospital, Barpeta, Assam, India.

²Department of Pathology, Fakhruddin Ali Ahmed Medical College and Hospital, Barpeta, Assam, India.

³Department of Pathology, Fakhruddin Ali Ahmed Medical College and Hospital, Barpeta, Assam, India.

⁴Department of Forensic Medicine, Fakhruddin Ali Ahmed Medical College and Hospital, Barpeta, Assam, India.

ABSTRACT

BACKGROUND

A spectrum of pathological bone lesions can present in any form from inflammatory to neoplastic. These lesions are diverse in their clinical and morphological features and range in behaviour from innocuous to rapidly fatal. Accurate diagnosis, proper staging and appropriate treatment are thus necessary to ensure maximum patient survival and maintain optimal function of the affected body parts. We wanted to determine the pattern of various bone lesions and their relative frequency.

METHODS

This is a hospital based prospective study. After obtaining detailed clinical history, and examination, biopsies were received in 10 % formalin and histopathological examination was done.

RESULTS

The maximum number of bone lesions occurred in second decade of life. Out of 91 histopathologically diagnosed bone lesions, 54 (59.3%) were males and 37 (40.7 %) were females, with a male to female ratio of 1.5 : 1. Age ranged from 6 - 70 years. Nonneoplastic lesions accounted for 45.1 %, while neoplastic lesions accounted for 54.9 %. Chronic osteomyelitis was the most common non-neoplastic lesion encountered with 25 cases (27.4 %). Out of 50 cases of bone tumours, benign tumours accounted for 34.1 %, while malignant tumours accounted for 20.9 %. The most common benign tumour in this study was giant cell tumour and the most common malignant tumour was osteosarcoma. The most common presenting complaint of all bone lesions was pain (96.7 %) followed by swelling (75.8 %).

CONCLUSIONS

For precise diagnosis of majority of bone lesions, histopathology is regarded as the gold standard. A multidisciplinary approach (clinical, radiological and histopathological) is required for exact diagnosis of different lesions.

KEYWORDS

Histopathology, Osteomyelitis, Bone

Corresponding Author:

*Dr. Partha Pratim Das,
Assistant Professor,
Department of Forensic Medicine,
Fakhruddin Ali Ahmed Medical College
and Hospital, Jania Road,
Barpeta, Assam, India.
E-mail: ppgmc@gmail.com*

DOI: 10.18410/jebmh/2020/448

How to Cite This Article:

*Das PK, Dutta B, Musfique J, et al.
Clinicopathological study of lesions of
bone – a hospital-based study J Evid
Based Med Healthc 2020; 7(39), 2161-
2164. DOI: 10.18410/jebmh/2020/448*

*Submission 06-07-2020,
Peer Review 15-07-2020,
Acceptance 15-08-2020,
Published 28-09-2020.*

*Copyright © 2020 Prasanta Kumar Das
et al. This is an open access article
distributed under Creative Commons
Attribution License [Attribution 4.0
International (CC BY 4.0)]*

BACKGROUND

Bone lesions can affect any part of the body and develop in any section of bone, from the surface to the bone marrow in the center. A growing lesion can destroy healthy tissue and weaken the bone, making it more vulnerable to fractures. Most bone lesions are benign, not life-threatening, and will not spread to other parts of the body. Some bone lesions, however, are malignant, which means they are cancerous. These bone lesions can sometimes metastasize and further complicate treatment and prognosis. The American Cancer Society's estimates for cancer of the bones and joints for 2020¹ are: Primary cancers of bones account for less than 0.2 % of all cancers. In adults, over 40 % of primary bone cancers are chondrosarcomas. This is followed by osteosarcomas (28 %), chordomas (10 %), Ewing tumours (8 %), and malignant fibrous histiocytoma / fibrosarcoma (4 %). In children and teenagers (those younger than 20 years), osteosarcoma (56 %) and Ewing tumours (34 %) are much more common than chondrosarcoma (6 %).

Various hospital-based registries have attempted to gauge the incidence and distribution of sarcomas in the Indian population; however, there is no recent, population-based evaluation of the incidence of bone sarcomas in India. In as early as 1998, Yeole and Jussawalla² published the incidence of bone malignancy in Mumbai, based on the data from the Bombay Cancer Registry. As per that registry, bone malignancies were found to represent 0.9 % of all cancers with Ewing sarcoma as the most common bone malignancy. As per hospital-based cancer registry, 2001, TMH, Mumbai, Maharashtra, India OGS was found to be the most common bone sarcoma, followed by Ewing sarcoma / PNET and chondrosarcoma.³ Based on retrospectively collected data over 36 years in Karnataka, Rao et al⁴ found that out of the 523 bone tumours, 39 % were malignant, with OGS and Ewing sarcoma constituting 45.7 % and 19.4 % of malignant bone tumours, respectively.⁵ Recent data from the registry of JSS Medical College and Hospital, Mysore, Karnataka, India where a review of 117 cases over a period of 8 years was conducted, showed that the majority of malignant bone tumours were OGS (35.14 %) with a median age of presentation being 26.87 years. In this study the pattern of prevalence of bone tumours in this part of the country is being studied so that appropriate comparison can be done.

We wanted to determine the pattern of various bone lesions and their relative frequency.

METHODS

This is a prospective study conducted in Fakhruddin Ali Ahmed Medical College and Hospital, Barpeta, among patients presenting with bony swelling / lesions in the Department of Orthopaedics from May 2018 to April 2020.

Sample Size

Taking into consideration eminent study by Yeole & Jussawalla 1998, based on the data from Bombay Cancer

Registry that bone tumours are rare accounts for about 0.9 % of all tumours, applying the formula of $4q / l^2$ where the prevalence is taken as 0.9 %, and l being allowable error which we have taken as 2 % in the current study, the sample size was calculated to be 85 which was adjusted to 91 owing to quantity to cases in the stipulated duration i.e. 2 years.

Data Collection

After obtaining approval of IEC & requisite permission, ninety one cases taken up for the study and subjected to histopathology.

Data Analysis

The data collected was entered in MS excel spreadsheet and subjected to statistical analysis using SPSS version 20.0. The frequency, proportion and percentages were calculated. Results were organized in the form of tables. The name of the participants was kept confidential.

RESULTS

Histopathological Type	0-10	11-20	21-30	31-40	41-50	51-60	61-70	Total (%)
Infectious Aetiology								
Subacute pyogenic osteomyelitis	0	0	1	0	0	2	0	3 (3.3 %)
Chronic osteomyelitis	0	5	6	5	7	1	1	25 (27.4 %)
Tuberculous osteomyelitis	1	10	0	0	0	1	1	13 (14.2 %)
Chondrogenic Tumours								
Benign	1	2	0	4	2	1	0	10 (10.9 %)
a. Osteochondroma	0	0	2	2	0	0	0	4 (4.4 %)
b. Chondroma	0	0	0	0	0	0	0	0
Osteogenic Tumours								
Benign	0	1	0	2	0	1	0	4 (4.4 %)
a. Osteoid osteoma	0	0	0	0	0	0	0	0
Malignant	0	4	0	0	3	4	0	11 (12.1 %)
a. Osteosarcoma	0	0	0	0	0	0	0	0
Ewing's Sarcoma	0	2	0	0	0	1	0	3 (3.3 %)
Haematopoietic Neoplasms								
1. Plasma cell myeloma	0	0	0	0	0	0	2	2 (2.2 %)
Giant Cell Tumours	0	0	2	3	2	2	2	11 (12.1 %)
Giant cell tumour	0	0	0	0	0	0	0	0
Miscellaneous Lesions								
Intermediate	0	1	1	0	0	0	0	2 (2.2 %)
Aneurysmal bone cyst	0	0	0	0	0	1	2	3 (3.3 %)
Metastasis	0	0	0	0	0	1	2	3 (3.3 %)
Total	2	25	12	16	14	14	8	91 (100.0 %)

Table 1. Various Benign and Malignant Bone Lesions Based on Age

Histopathological evaluation was done in all 91 cases, obtained over a period of 2 years in a tertiary care hospital. In this study, nonneoplastic lesions accounted for 41 (45.1 %), while neoplastic lesions accounted for 50 (54.9 %) (Table 1). Chronic osteomyelitis was the most common nonneoplastic lesion encountered with cases 25 (27.4 %) (Table 2). Out of 50 cases of bone tumours, benign tumours made up to 31 (34.1 %), while the malignant tumour made up 19 (20.9 %).

Sl. No.	Histopathological Type	Pain (%)	Swelling (%)	Sinus / Ulcer (%)	Fractures (%)	Trauma (%)	Joint Movement Restriction (%)
I. Infectious Aetiology							
1.	Pyogenic osteomyelitis (3)	3 (100 %)	3 (100 %)	3 (100 %)	1 (33.3 %)	1 (33.3 %)	0
2.	Chronic osteomyelitis (25)	25 (100 %)	15 (60 %)	2 (8 %)	9 (36 %)	10 (40 %)	20 (80 %)
3.	Tuberculous osteomyelitis (13)	13 (100 %)	10 (76.9 %)	1 (7.6 %)	3 (23 %)	0	8 (61.5 %)
II. Chondrogenic Tumours							
1.	Benign (14)	14 (100 %)	11 (78.6 %)	0	0	1 (7.1 %)	9 (64.3 %)
III. Osteogenic Tumours							
1.	Benign (4)	4 (100 %)	4 (100 %)	0	0	0	3 (75 %)
2.	Malignant (11)	11 (100 %)	9 (81.8 %)	1 (9 %)	1 (9 %)	1 (9 %)	8 (72.7 %)
IV.	Ewings Sarcoma (3)	3 (100 %)	3 (100 %)	0	0	0	1 (33.3 %)
V. Haematopoietic Neoplasms							
1.	Plasma cell myeloma (2)	2 (100 %)	1 (50 %)	0	0	0	1 (50 %)
VI.	Giant Cell Tumours (11)	8 (72.7 %)	10 (90.9 %)	0	0	2 (18.1 %)	9 (81.8 %)
VII. Miscellaneous Lesions							
1.	Intermediate Aneurysmal bone cyst (2)	2 (100 %)	2 (100 %)	0	0	0	1 (50 %)
VIII.	Metastasis (3)	3 (100 %)	1 (33.3 %)	2 (66.7 %)	2 (66.7 %)	1 (33.3 %)	3 (100 %)
Total		88 (96.7%)	69 (75.8 %)	9 (9.9%)	16 (17.6 %)	16 (17.6 %)	63 (69.2 %)

Table 2. Clinical Presentation of Bone Lesions

DISCUSSION

This is a prospective study done to evaluate different patterns and relative frequency of various bone lesions. In this study, out of the 91 bone specimens received during the study period, neoplastic lesions were found to be more common than nonneoplastic lesions which is in conformity with studies done by Settakom et al.⁶ Most tumours of the bone showed male preponderance with male to female ratio of 1.5:1. Similar findings were reported in other studies.^{7,8,9,10,11,12} The peak age incidence of primary bone tumours in our study was seen in the 2nd and 3rd decade. Similar findings in age incidence were also reported in other studies.^{8,13,14} Metastatic bone tumours were seen in older age group (above 50 years). In a study conducted by Sirikulchayanonta et al.¹⁵ There were similar findings with average age of 50 years in metastatic bone tumours. The most common malignant bone tumour was osteosarcoma. Male preponderance was seen and long bones were commonly involved. Similar findings were observed in other studies.^{6,7,8} We found two peaks in age incidence, first between 11 and 20 years and second between 31 and 40 years which is similar to other studies.¹⁶ Long bones were mostly affected. Most commonly femur followed by tibia which is in conformity with other studies.^{7,8,11,14}

CONCLUSIONS

In our study, we have found that the pathology department (histopathological section) has reported a spectrum of 12 different types of histopathological bone tumours during the study period of 2 years which indicate the presence of different types of bone tumours in FAAMCH, Assam in general. Specific tumour has predilection for a certain age, sex, and site which are in conformity with our study from the data reviewed. Lastly, an exact diagnosis of bone tumours is at times difficult. Therefore, an integrated use of clinical, radiological, and histopathological finding is recommended to increase the accuracy of diagnosis and for better management of the patient.

Financial or Other Competing Interests: None.

REFERENCES

- [1] American Cancer Society. Facts & Figures 2020. American Cancer Society. Atlanta, Ga. 2020.
- [2] Yeole BB, Jussawalla DJ. Descriptive epidemiology of bone cancer in greater Bombay. Indian J Cancer 1998;35(3):101-106.
- [3] Dinshaw KA, Ganesh B. Hospital Based Cancer registry. Annual Report 2001. Mumbai: Tata Memorial Hospital 2005: p. 90-91.
- [4] Rao VS, Pai MR, Rao RC, et al. Incidence of primary bone tumours and tumour like lesions in and around Dakshina Kannada district of Karnataka. J Indian Med Assoc 1996;94(3):103-104, 121.
- [5] Jain K, Sunila, Ravishankar R, et al. Bone tumours in a tertiary care hospital of South India: a review 117 cases. Indian J Med Paediatr Oncol 2011;32(2):82-85.
- [6] Settakom J, Lekawanvijit S, Arpornchayanon O, et al. Spectrum of bone tumours in Chiang Mai University Hospital, Thailand according to WHO Classification 2002: a study of 1,001 cases. J Med Assoc Thai 2006;89:780-787.
- [7] Aziz-ur-Rehman, Qureshi H, Shafiullah. Bone tumours and tumour-like lesions: 10 years retrospective analysis of biopsy results. J Postgrad Med 2004;18(1):40-45.
- [8] Baena-Ocampo Ldel C, Ramirez-Perez E, Linares-Gonzalez LM, et al. Epidemiology of bone tumours in Mexico City: retrospective clinicopathologic study of 566 patients at a referral institution. Ann Diagn Pathol 2009;13(1):16-21.
- [9] Van den Berg H, Kroon HM, Slaar A, et al. Incidence of biopsy proven bone tumours in children: a report based on Dutch pathology registration "PALGA". J Pediatr Orthop 2008;28(1):29-35.
- [10] Stiller CA, Bielack SS, Jundt G, et al. Bone tumours in European children and adolescent 1978 - 1997. Report from Automated Childhood Cancer Information System Project. Eur J Cancer 2006;42(13):2124-2135.
- [11] Mohammed A, Sani MA, Hezekiah IA, et al. Primary bone tumour and tumour like lesions in children in Zaria, Nigeria. Afr J Paediatr Surg 2010;7(1):16-18.
- [12] Shah SH, Muzaffar S, Soomro IN, et al. Clinicomorphological pattern and frequency of bone cancer. J Pak Med Assoc 1999;49(5):110-112.

- [13] Mohammed A, Isa HA. Pattern of primary tumours and tumour like lesions of bone in Zaria, Northern Nigeria: a review of 127 cases. *West Afr J Med* 2007;26(1):37-41.
- [14] Sarma NH, al-Fituri O, Visweswara RN, et al. Primary bone tumour in eastern Libya- a 10 year study. *Cent Afr J Med* 1994;40(6):148-151.
- [15] Sirikulchayanonta V, Wongwaisayawan S. Metastatic bone tumours in Ramathibodi Hospital, Thailand during 1985-90. *J Med Assoc Thai* 1992;(75 Suppl 1):131-135.
- [16] Rosai J. *Rosai and Ackerman's Surgical Pathology*. Vol. 2. 10th edn. UK: Elsevier Inc., 2011: p. 2013-2014.