

A Retrospective Analysis of Bone Tumours at Tertiary Care Hospital of Rural India: A 5 Years Analysis

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Abstract

Background: Bone tumours are less commonly encountered lesions, and they pose a definite diagnostic challenge. *Aims and Objective:* The aims and objective of this study is to determine the incidence of bone tumours reported to the tertiary care rural teaching hospital and correlate various bone tumours with age and gender and anatomical location. *Materials and Methods:* A retrospective study of all bone lesions was done for 5 years from January 2013 to December 2017 in departments of Orthopedics, Radiology and Pathology at a tertiary care teaching hospital, central rural India. A total of 216 cases of different bone lesions were studied. Relevant history, clinical data, and radiological reports were obtained from the concerned departments. *Results:* The present study shows that the incidence of benign bone lesions is 66.2%. The malignant bone lesions accounted for 33.8%. The younger males were commonly affected (20.4%). The peak age incidence of bony lesions was found to be 21-30 years in 27.31% of the cases. Among the neoplastic lesions, giant cell tumour (35.2%) and osteosarcoma (16.2%) were the most common benign and malignant tumours, respectively. *Conclusion:* Benign bone tumours were the most common tumours. Among the bony tumours, giant cell tumour is the most common benign tumour, and osteosarcoma was the common malignant lesions. The clinical data, radiology, and histopathology all when correlated help to establish the correct diagnosis of bone tumours.

Keyword: Bone Tumour; Benign; Malignant; Bone Like Lesion.

Introduction

Bone tumours especially malignant ones pose a lot of burden on individual, family and society in terms of emotional and financial stress. Bone tumours are the tumours of de novo origin and most of them have peculiarity about their occurrence in particular age group or anatomical location. Few of the bone tumours show bimodal age presentation.

Bone especially axial skeleton has been known for its association for metastasis of various malignant tumours. Due to the abundance of red marrow in axial skeleton, tumours prefer to

metastasize in vertebral column and other parts of axial skeleton than the appendicular skeleton.

These metastasis is seen as lytic lesions in appendicular skeleton which usually comes from primary tumours from various organs especially lungs, kidney, thyroid, breast, gastrointestinal tract [1].

Though diverse age group is affected with bone tumours, mostly adolescent age group is found to be affected. The benign tumours are diagnosed as swelling and discomfort than pain or restriction of movement but those with malignant features are fast growing with pain and swelling associated sometimes with restriction of movement.

The investigations from basic X rays to CT scans and MRI make the probable diagnosis easy with more accuracy except the histopathological investigation for the definitive diagnosis [12].

Though the definitive diagnosis is difficult, the investigations in the form of biochemical tests do not lead to specific diagnosis [2-3].

The age, sex, and anatomical location of lesions are essential criterion for diagnosing the tumours [4].

To establish an accurate diagnosis, relevant clinical examination findings, plain radiograph, CT, MRI and histopathology are the recommended line of investigations.

Material and Methods

The retrospective analysis carried out at Acharya Vinoba Bhave Rural Hospital at Sawangi, Wardha is tertiary care teaching hospital in the central India. A total of around 249 cases of bone and surrounding area were initially collected from OPD and indoor patients and subsequently the histopathology section.

Among them, 216 cases of actual bone tumours were included in this study. The cases irrespective of their age and sex were considered.

The classification was based on World Health Organization histological classification of bone tumours. Patients presenting with infective pathology and traumatic origin were excluded from the study.

The relevant data for all the cases, i.e., age, sex, site of lesion, and diagnosis, were all retrieved from department of Orthopedics, Radio diagnosis and Pathology departments.

Result

Total 216 cases of bone lesions were primarily included in the study.

The age range of the bone tumour was from age 4 years to 84 years old, in which 136 were males and 80 were female cases. Male outnumbered female approximately 1.7: 1 ratio. Youngest was a 4 years old female child with osteochondroma and oldest was 84 years female with metastatic lesion in spine (Table 1).

The most common site of occurrence of tumour was distal femur 57cases (26.4%), followed by tibia

44 cases (20.4 %). Giant cell tumour mostly involved distal femur 17 (22%) cases followed by 14 (18%) cases of proximal tibia (Table 2).

Of 216 cases of bone tumours, the most common benign and malignant tumour were 76 (35.1%) cases of giant cell tumour, and 35 cases of osteosarcoma (16.2%) respectively (Table 3). While the most common benign lytic lesion with Aneurysmal bone cyst 8 cases (0.4%) followed by 6 cases (0.2%) of fibrous dysplasia.

Table 1: Distribution of patients as per their age group

Age group	Male	Female
0 to 10	2	2
11 to 20	20	16
21 to 30	44	15
31 to 40	19	19
41 to 50	22	10
51 to 60	9	13
61 to 70	18	2
71 to 80	2	2
81 to 90	0	1

Table 2: Distribution of patients as per their anatomical sites

shoulder	1
Scapula	12
Proximal tibia	44
Proximal Humerus	6
Proximal fibula	9
Proximal femur	10
Distal femur	57
Distal radius	21
Distal tibia	5
Distal volar forearm	1
Calcaneum	9
Dorsal spine	6
Lumbar spine	2
Knee joint	6
Metacarpal	15
Mid shaft tibia	3
Iliac bone	8
Clavicle	1
Total	216

Table 3: Distribution of patients as per their tumour like lesions

Aneurysmal Bone Cyst	8
Chondroblastoma	3
Chondrosarcoma	9
Enchondroma	8
Ewings sarcoma	7
Fibrous dysplasia	6
Giant cell tumour	76
Metastases	11
Multiple myeloma	11
Simple bone cyst	2
Osteoblastoma	2
Osteochondroma	29
Osteoid osteoma	9
Osteosarcoma	35
Total	216

Primary malignant bone tumour was osteosarcoma with 35 cases (16.2%) followed by chondrogenic sarcoma 9 cases (0.4%), followed by Ewing’s Sarcoma 07 cases (0.3%) and 11 cases (0.5%) of metastatic tumours. Among the benign lesions,

osteochondroma 29 cases (13.4%) followed by osteiod osteoma 09 cases (0.4%) and aneurysmal bone cyst 8 cases (0.4%), enchondroma 08 cases (0.8 cases), and fibrous dysplasia 06 cases (0.2%).

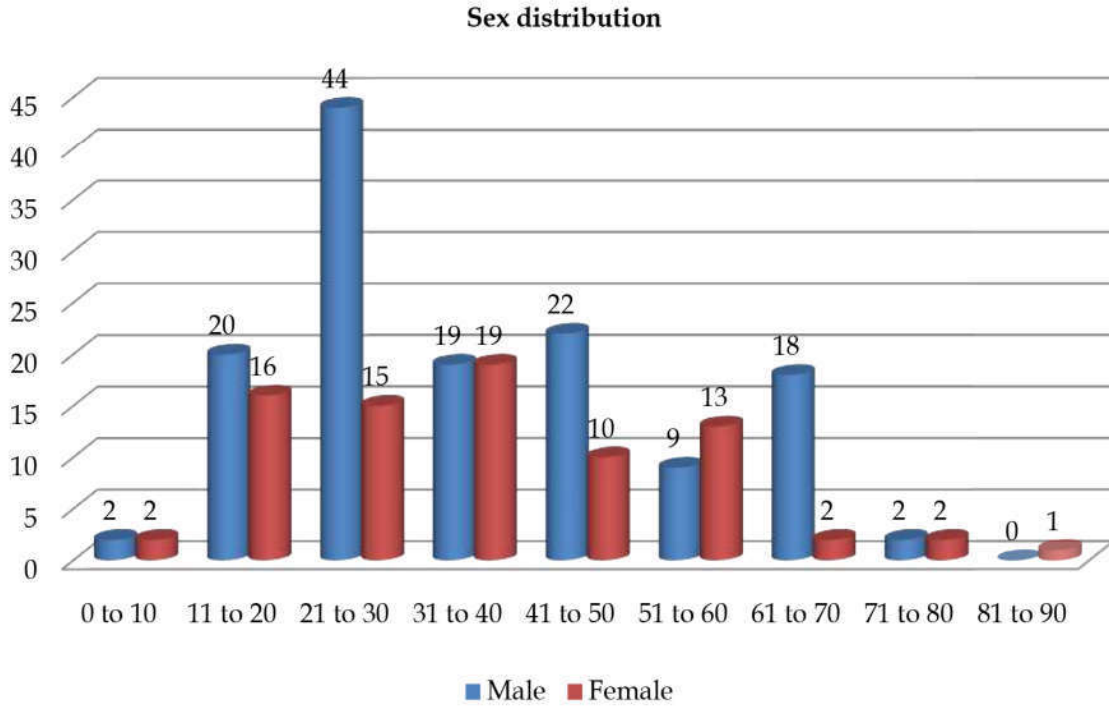


Fig. 1: Distribution of patients as per their age group

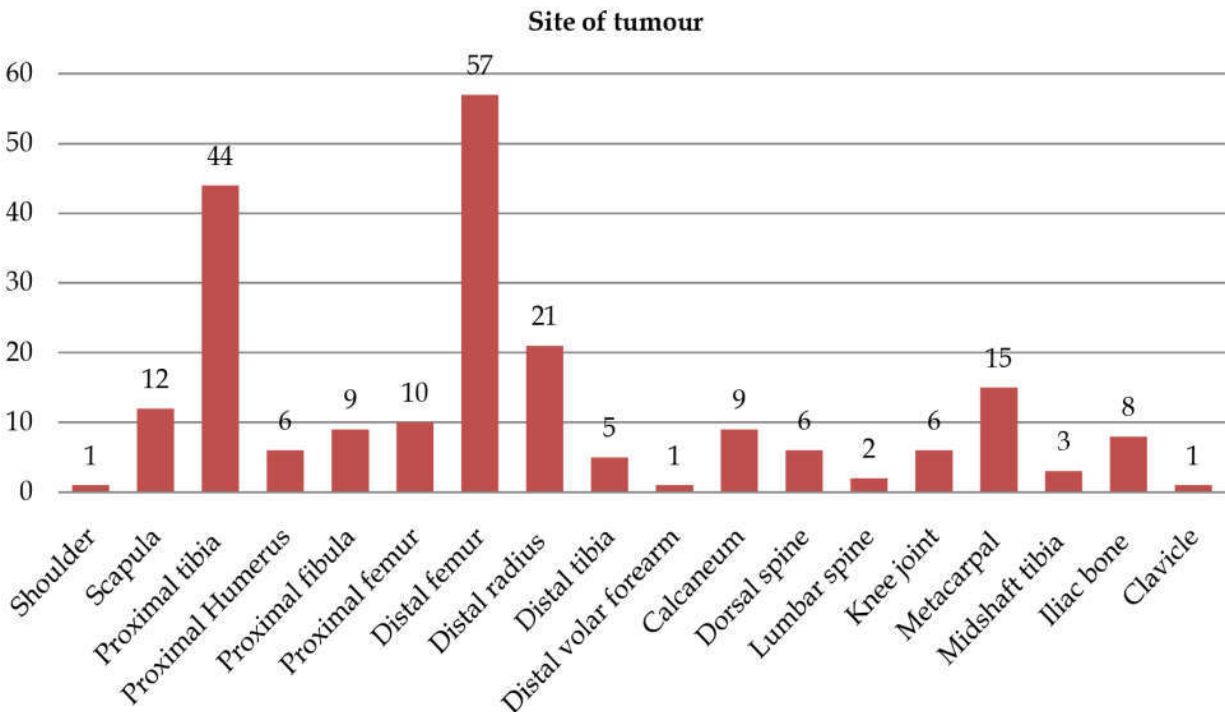


Fig. 2: Distribution of patients as per their anatomical sites

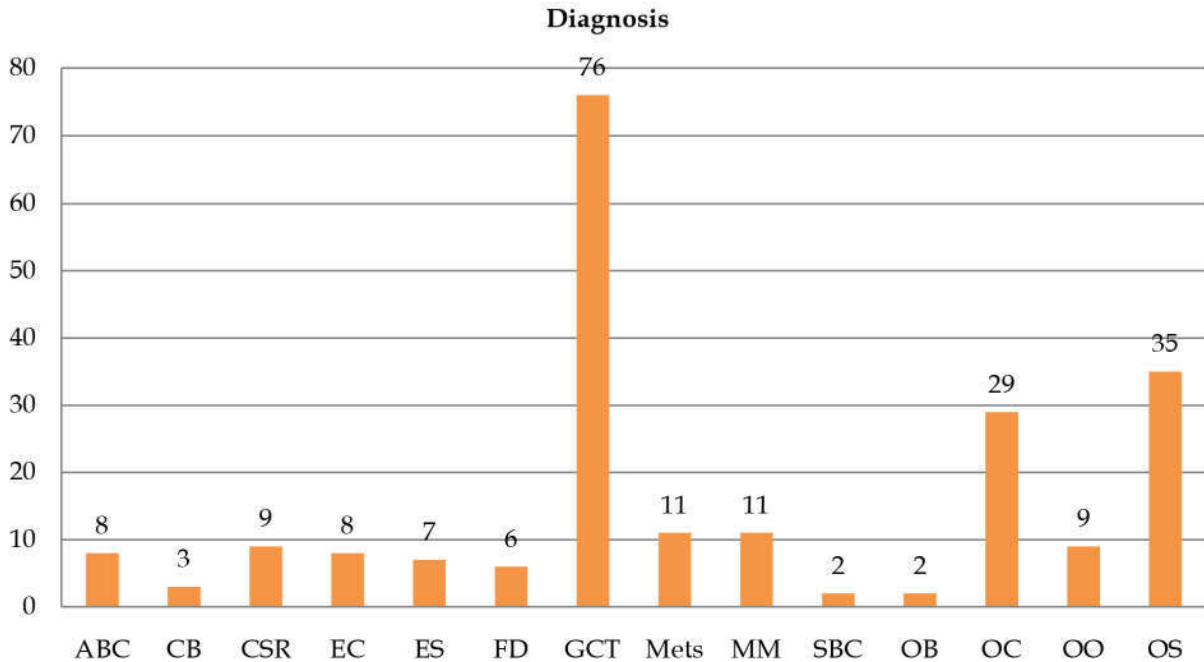


Fig. 3: Distribution of patients as per their tumour like lesions

Discussion

In the retrospective analytical study of 216 cases of bone tumour, occurrence of maximum number of tumours in particular age groups have noticed. Of these tumours; 59 cases (27%), 38 cases (17.5 %) and 36 cases (16.6%) were in age group of 21-30, 31-40 and 11-20 years of age group respectively. Twenty cases (10.1%) were noticed in age group of 51-60 years, followed by 20 cases (9.2%) in age group of 61-70 years. Similar findings were found in studies done by Abdul Kareem et al., Kumar V et al. and Karun Ji et al. [5-7].

In the present study, Giant cell tumour was noticed as the commonest benign bone tumour accounting 76 cases (35%). Similar to present study, Giant cell tumour was found to be the commonest finding in studies of Settakorn et al., Estrada-Villasenor et al., Popat et al., Kundu et al., Sharma et al. [8-12]

In this study, osteochondroma 29 cases (13.4%) noticed as second most common benign tumour among all benign bone tumours, in contrast to many studies where authors found osteochondroma as most common benign tumour [15-18].

In this study, we found primary malignant bone tumour, osteosarcoma with 35 cases (16.2%) as the most common primary malignant bone tumour with few similar studies showing osteosarcoma as the

commonest primary malignant bone forming tumour [8,12,13,15,16]. In contrast to this study, few studies have found that metastases from epithelial malignancies are most common malignant tumour involving bone [19].

Similar to our study, Negash et al., Settakorn et al., Wani et al., Patel et al., Sharma et al., Ramdass et al. found Osteosarcoma as the most common osteogenic tumour in their studies [8,12,13,15,16,18].

In contrast, Ozkan et al. [17] found Osteoid osteoma as common bone forming tumour while Bamanikar et al. [14] found both Osteoid osteoma and Osteosarcoma as the most common bone forming tumours.

In this study, we noticed chondrogenic sarcoma 09 cases (0.4%) as second commonest malignant bone tumour in contrast to few studies which do not show chondrosarcoma among most common bone tumour.

In this study, we noticed Ewing's Sarcoma 07 cases (0.3%) to be less commoner than osteosarcoma and chondrosarcoma tumours which is in contrast to few studies which shows osteosarcoma as the commonest primary malignant tumour whereas few studies showed Ewing's sarcoma as the commonest malignant bone tumour [20].

In present study, Aneurysmal bone cyst (04; 50.0%) was the most common cystic bone tumour whereas fibrous dysplasia as second commonest benign cystic bone tumour.

Negash et al., Settakorn et al., Sharma et al., Ramdass et al found Fibrous Dysplasia, and Puthur, Ommen et al found Simple bone cyst as the most common tumour like lesion of bone, in contrast to present study [8,12,13,18,21,22].

However, Bamanikar et al. and Patel et al. found the equal incidence of Aneurysmal bone cyst and Fibrous dysplasia [14,16].

Multiple myeloma was the most common primary malignant bone tumour usually occurring in sixth to seventh decade of life with multiple sites involvement. In present study we found eleven cases (0.5%) in age group of fifth to seventh decades with predilection to spine region [23].

In this study, we noticed femur especially distal end of femur was the most common bone affected (57; 26.4%), followed by tibia, mostly proximal tibia (44; 20.3% cases. This was similar to the studies who found femur as the most common site [24].

Conclusion

The present study gives an estimate of the spectrum and demography of bone tumours and tumour like lesions in central rural India. The findings show little deviation from the literature available from various parts of India.

Giant Cell Tumour was the commonest primary benign bone tumour. Males were outnumbered female. Maximum numbers of bone tumours were found in the age range 21-30 years and all are primary bone tumour and tumour like lesions.

The clinical data, radiology, and histopathology all when correlated help to establish the correct diagnosis of bone tumours

Key Messages

Among the bone tumours, giant cell tumour and osteosarcoma were the most common benign and malignant tumours, respectively in present study

References

1. Modi D, Rathod GB, Delwadia KN, Goswami HM. Histopathological study of bone lesions - A review of 102 cases. IAIM 2016;3:27-36.
2. Kethireddy S, Raghu K, Chandra Sekhar KPA, Babu YS, Dash M. Histopathological evaluation of neoplastic and non-neoplastic bone tumours in a teaching hospital. J Evol Med Dent Sci 2016;5:6371-4.
3. Hathila RN, Mehta JR, Jha BM, Saini PK, Dudhat RB, Shah MB. Analysis of bone lesions in tertiary care center - A review of 79 cases. Int J Med Sci Public Health 2013;2:1037-40.
4. Deoghare SB, Prabhu MH, Ali SS, Inamdar SS. Histomorphological spectrum of bone lesions at tertiary care centre. Int J Life SciSci Res 2017;3:980-5.
5. Abdulkarem FB, Eyesan SU, Akinde OR, Ezembakwe ME, Nnodu OE. Pathological study of Bone Tumours at the National Orthopaedic Hospital, Lagos, Nigeria. West African J Medicine 2007;26(4):306-11.
6. Kumar V, Abbas A, Fauston, Aster. Thyroid gland. In: Kumar V, Abbas A, fauston, Aster, editors. Robbins and Cottran pathologic basis of disease, 7th ed. New Delhi: Elsevier; 2010:1235.
7. Karun Ji, Sunila, Ravishankar R, Mruthyunjaya, Rupakumar CS. Gadiyar, HB. Manjunath GV. Bone tumours in a tertiary care hospital of south asia: A review of 117 cases. Indian J Med Paediatr Oncol 2011;32:82-85.
8. Settakorn J, Lekawanvijit S, Arpornchayanon O, Rangdaeng S, Vanitanakom P, Kongkarnka S, et al. Spectrum of Bone Tumors in Chiang Mai University Hospital, Thailand According to WHO Classification 2002: A Study of 1,001 Cases. J Med Assoc Thai. 2006;89:6.
9. Estrada-Villaseñor EG, Flores-Carmona JF, Delgado-Cedillo EA, Rico-Martínez G. Bone tumor frequency in adults and elderly. ActaOrtop Mex. 2008;22(6): 356-60.
10. Popat V, Sata V, Vora D, Bhanvadia V, Shah M, Kanara L. Role of Histopathology In Lytic Lesions Of Bone - A Study Of Seventy Cases Of Lytic Lesion Of Bone. The Internet J Orthopedic Surg. 2010;19:1.
11. Kundu ZS, Gupta V, Sangwan SS, Rana P. Curettage of benign bone tumors and tumor like lesions: A retrospective analysis. Indian J Orthop. 2013;47(3): 295-301.
12. Sharma S and Mehta NP. Histopathological Study of Bone Tumors. Internat J Sci Res. 2015;4(12):1970-2.
13. Negash BE, Admasie D, Wamisho BL, Tinsay MW. Bone tumors at Addis Ababa University, Ethiopia: Agreement between radiological and histopathological diagnoses, a 5-year analysis at Black-Lion Teaching Hospital. Internat J Medic and Medic Sci. 2009; 1(4):11.
14. Bamanikar SA, Pagaro PM, Kaur P, Chandanwale SS, Bamanikar A, Buch AC. Histopathological Study of Primary Bone Tumours and Tumour-Like Lesions in a Medical Teaching Hospital. JKIMSU. 2015;4:2.
15. Wani LA, Ashai FB, Bandy BM, Ashraf A, Mushtaq S, Itoo MS, et al. Primary Bone tumours in Kashmir

- valley- a retrospective histopathological study. *Internat J Basic Applied Sci.* 2015;4(1):51-6.
16. Patel D, Patel P, Gandhi T, Patel N, Patwa J. Clinicopathological study of bone lesions in tertiary care center - a review of 80 cases. *International Journal of Advanced Research.* 2015;3(7):1267-72.
 17. Özkan EA, Göret CC, Özdemir ZT, Yanık S, Doğan M, Gönültaş A, et al. Pattern of primary tumors and tumor-like lesions of bone in children: retrospective survey of biopsy results. *Int J Clin Exp Pathol.* 2015;8(9):11543-8.
 18. Ramdass MJ, Mooteeram J, Beharry A, Mencia M, Barrow S. An 8-YEAR analysis of bone tumours in a Caribbean island. *Annals of Medic Surg.* 2015;4:414-6.
 19. Virk MS, Lieberman JR. Tumour metastases to bone. *Arthritis Res Ther.* 2007;9(1):S5.
 20. Kumavat PV, Gadgil NM, Chaudhari CS, Rathod UK. Bone tumours and tumour-like lesions: A study in a tertiary care hospital Mumbai. *Annals of Pathology and Laboratory medicine,* 2017;4(1): 10-18.
 21. Puthur DK. Tumour like lesions: Understand the difference. *Kerala J Orthopaed.* 2013;137-42.
 22. Oommen AT, Madhuri V, Walter NM. Benign tumors and tumor-like lesions of the calcaneum: A study of 12 cases. *Ind J Cancer.* 2009;46(3):234-6.
 23. Rosenberg AE. Bones, Joints and soft tissue tumour. In Kumar V, Abbas AK, Fausto N, Aster JC editors. *Robbins and Cotran; Pathologica Basis of diseases.* 8th ed. Gurgaon: Elsevier Read Elsevier India private limited; 2010.pp.1205-56.
 24. Nidhi V, Amit T, Preeti S et al. Incidence of bone tumors and tumor like lesions at a tertiary centre - a study of 64 cases. *Int J Res Med Sci.* 2018 Feb;6(2): 533-538.
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