

Original Research Article

A retrospective analysis of bone tumors and tumor like lesions: a hospital based study of 76 cases

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ABSTRACT

Background: Globally Bone tumors constitute 0.5% of the total World Cancer Incidence. In addition to benign and malignant bone tumors there are a number of nonneoplastic lesions that present in a manner similar to neoplastic conditions. Relevant demographic features such as age, sex and skeletal site are important to come to a conclusive diagnosis. The present study aims to show the prevalence and demography of bone tumors and tumor like lesions.

Methods: A total of 76 cases of Bone Tumors and Tumor like Lesions were studied. They were reviewed and analyzed for age, gender, site of tumor and histologic types. Classification was done according to WHO histologic Classification of Bone Tumors.

Results: There were 49 cases of primary bone tumors and tumor Like lesions with a median age of 22 years and 27 cases of metastatic bone tumors with a median age of 56 years. Males are more commonly affected. Osteosarcomas and Chondrosarcomas are the most common primary malignant Bone Tumors.

Conclusions: Metastatic bone tumors constitute the highest number of bone tumors occurring at an older age group. Maximum numbers of bone tumors are found in the age range 11-20 years and all are primary bone tumor and tumor like lesions.

Keywords: Bone tumors, Metastatic, Site

INTRODUCTION

The Global Incidence of Bone Tumors is quite low compared to the myriad of other tumors constituting 0.5% of the total World Cancer Incidence.¹ Primary bone tumors account for only 0.2% of all malignancies.² In addition to benign and malignant bone tumors there are a number of nonneoplastic lesions that present in a manner similar to neoplastic conditions. Although benign bone tumors outnumber primary malignant tumors, it is likely that benign lesions are underestimated because they often are asymptomatic and not clinically recognized.³ The age distribution of Bone Tumors is bimodal with one peak in adolescent and a second peak in patients over 60 years.⁴ Relevant features such as age, skeletal site, specific area within the bone, imaging and histopathology are

important to come to a conclusive diagnosis.^{5,6} Furthermore, few studies are present in this field. The present study aims to show the prevalence and demography of bone tumors and tumor like lesions.

METHODS

All cases of Bone Tumors and Tumor like Lesions that were reported in the period between January 2014 to August 2017 in the department of Pathology CCHRC Silchar were included in this study. They were reviewed and analyzed for age, gender, site of tumor, imaging and histological findings. Record of other investigations and management were also collected from Clinical records. Patients with infective, inflammatory bone lesions and bone tumors of odontogenic origin were excluded from

the study. Classification was done according to WHO histologic Classification of Bone Tumors.⁷

RESULTS

A total of 76 cases of Bone Tumors and Tumor like Lesions were studied. There were 49 cases of Primary Bone Tumors and tumor Like lesions with a median age of 22 years and 27 cases of metastatic bone tumors with a median age of 56 years.

Osteosarcoma constitutes the most common primary malignant bone tumors followed by Chondrosarcomas, Multiple Myelomas and Ewing’s Sarcomas. Among the benign lesions giant cell tumor was the most common.

Table 1: Distribution of bone tumors and tumor like lesions.

Tumor and tumor like lesions	Numbers	%
Metastatic bone tumors	27	35.5
Osteosarcoma	11	14.5
Chondrosarcoma	10	13.2
Multiple myeloma	07	9.2
Ewing’s sarcoma	06	7.9
Giant cell tumors	05	6.6
Pleomorphic sarcoma	05	6.6
Fibro-osseous lesions	03	3.9
Chordoma	01	1.3
Chondroma	01	1.3

Table 2: Age range distribution of bone tumors and tumor like lesions.

	1-10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs	81-90	Total
OS	1	10								11
CS		1	2	3		4				10
MM					3	1	2		1	7
ES		6								6
GCT		1	4							5
PS		1	2	1		1				5
FOL		2			1					3
ENC		1								1
C					1					1
MET				3	5	7	8	4		27
Total	1	20	8	7	10	13	10	4	1	74

OS-Osteosarcoma, CS-Chondrosarcoma, MM-Multiple Myeloma, ES-Ewing’s Sarcoma, GCT-Giant Cell Tumor, PS-Pleomorphic Sarcoma, FOL-Fibro Osseous Lesions, ENC-Chondroma, C-Chordoma, MET-Metastasis.

Table 3: Sex distribution of bone tumors and tumor like lesions.

Tumor and tumor like lesions	Male	Female
Metastatic bone tumors	16	11
Osteosarcoma	9	2
Chondrosarcoma	5	5
Multiple myeloma	3	4
Ewing’s sarcoma	3	3
Giant cell tumors	3	2
Pleomorphic sarcoma	2	3
Fibro-osseous lesions	1	2
Chordoma	1	Nil
Chondroma	1	Nil

The peak age incidence for bone tumors was in the age group 11-20 years. All were primary bone tumors and tumor like lesions. The second peak was in the age group 51-60 years where the metastatic bone tumors constituted the commonest tumors. Metastatic Bone Tumors constitute the highest number of bone tumors accounting for 35.5% with M: F ratio of approx. 1.5:1. Majority of

the cases were of more than 50 years of age (70%). The commonest metastatic sites were vertebra (48%), pelvis (19%), femur (15%), scapula (11%), ribs (4%) and humerus (4%). The sites for primary tumors were lung cancers, breast cancer, thyroid cancer, gall bladder cancers and unknown cancers. Majority were metastatic adenocarcinomas.

Osteosarcomas and chondrosarcomas constituted the most common primary bone tumors. Age range of osteosarcoma was 9-19 years with M: F ratio of 4.5:1. 6cases were observed at the proximal end of tibia, two cases at the distal end of femur and one case each at the proximal end of humerus, mandible and pubic bone. All were conventional medullary osteosarcomas.

Age range of Chondrosarcoma was 18-58 years with a median age of 33.5 years and M: F approx. 1:1. Majority were found in the Pelvis and sacrum followed by one each at proximal femur, ribs, humerus and forearm. Majority was conventional chondrosarcoma and a single case of dedifferentiated chondrosarcoma was found.

Table 3: Sex distribution of bone tumors and tumor like lesions.

	OS	CS	MM	ES	GCT	PS	FOL	ENC	C	MET	Total
Sacrum		2	1		1				1		5
Vertebra			3							13	16
Pelvis	1	4	2				1			5	13
Scapula				1						3	4
Rib		1	1					1		1	4
Mandible	1					1					2
Femur	2 (LE)	1 (UE)			1 (UE)	1				4	9
Humerus	1 (UE)	1 (UE)		3						1	6
Tibia and Fibula	6T (UE)			2	2T (UE) 1F (LE)	1F 2T	2				16
Radius and Ulna		1 (UE)									1
Total	11	10	7	6	5	5	3	1	1	27	74

OS-Osteosarcoma, CS-Chondrosarcoma, MM-Multiple Myeloma, ES-Ewing’s Sarcoma, GCT-Giant Cell Tumor, PS-Pleomorphic Sarcoma, FOL-Fibro Osseous Lesions, ENC-Chondroma, C-Chordoma, MET-Metastasis, UE-Upper End, LE-Lower End

Multiple Myeloma accounted for 9.2% of all the tumors with an approx. equal M: F ratio and a higher age group 45-85yrs. All the cases had predilection to the axial skeleton including vertebra, pelvis and ribs.

6cases of Ewing’s Sarcoma with equal M: F; between 12-18years and located at scapula, humerus and lower extremity were found in this study.

Giant Cell Tumors accounted for 6.6% of all the tumors which was the most common benign bone tumor. M: F ratio was 1.5:1. Two cases were observed at the proximal end of tibia, one case each at distal end of femur, proximal end of fibula and sacrum. Majority of the cases were seen between 22-25 years whereas one case was below 20 years (17years).

Pleomorphic Sarcoma were found in 5cases (2Male and 3Females) from 19-55years. Lower extremity was the most common tumor location. 3 cases of fibro osseous lesions, one case each of chondroma and chordoma were found in the study.

DISCUSSION

The skeletal system is the third commonest site to be involved by metastatic tumor after lung and liver and metastatic carcinoma is the most frequent malignancy of bone.^{8,9} Metastatic bone tumors most frequently occur in patients older than 50 years and commonly originate from lung, gastrointestinal system, prostate, breast, and liver. Metastases can occur in any bone, but usually are located in the axial or proximal appendicular skeleton.^{10,11} Metastatic bone tumors were the most common bone tumors in our study. Majority were above 50 years with arrange 35-75 years. Vertebra was the commonest site. Unknown primary and lung carcinoma constitute the major primary sites.

The peak age of incidence of primary bone tumors and tumor like lesions in our study was 11-20 years followed by 21-30 years. Similar results were obtained in few Indian studies.^{12,13}

Osteosarcoma constitutes the most common primary bone tumor in young and adolescents. It occurs most frequently 11-20 years, occurring in the metaphysis, mostly in lower end of femur followed by upper end of tibia.¹⁴⁻¹⁷ Our study observed a similar finding except more cases were found in upper end of tibia.

Majority of Chondrosarcoma occur in the age group between 30-60 years. It commonly involves the pelvis, ribs and shoulder, along with the superior metaphyseal and diaphyseal regions of the arms and legs. There is a male predilection.¹⁴⁻¹⁶ All our cases had their usual anatomical site involvement but equal sex incidence. A single case was 18 years old.

Ewing sarcoma is an undifferentiated, primitive (or peripheral) neuro-ectodermal tumor occurring most commonly at the diaphysis of long bones, in the 5-20 years age group, with male predominance.¹⁴⁻¹⁶ Our study has matched with the available literature except for the equal male to female ratio.

Giant cell tumor and osteochondroma are the two most common benign tumors.^{12,13,18} Giant Cell Tumor commonly involves the long bones affecting lower end of femur, upper end of tibia and lower end of radius. It also involves the fibula, humerus, skull and less commonly the sacrum.¹⁴ There is a female preponderance.¹⁹ In our study, giant cell tumor was the most common benign bone tumor with similar anatomical distribution but male preponderance. Though multiple myeloma is the most common primary malignant bone tumor, it is not so common in this region. All the cases had a predilection to the central skeleton with a male predominance.¹³

Pleomorphic Sarcoma constitutes 13% of primary malignant bone tumor which appears high with an age range 19-55 years and female predominance.²⁰

CONCLUSION

Metastatic Tumors were the commonest bone tumors. Osteosarcomas and Chondrosarcomas were the most common primary malignant Bone Tumors. Giant Cell Tumor was the commonest primary benign bone tumor. Males were more commonly affected. Maximum numbers of bone tumors were found in the age range 11-20 years and all are primary bone tumor and tumor like lesions. Pleomorphic sarcoma appears comparatively high.

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