

# ANALYSIS OF BONE LESIONS IN TERTIARY CARE CENTER – A REVIEW OF 79 CASES

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## ABSTRACT

**Background:** Bone tumours are comparatively uncommon among wide array of lesions and pose a diagnostic problem as they constitute a small portion of diagnostic experience among pathologist.

**Aims & Objective:** To study the histopathological features of bone lesions and their correlation with age of presentation, site and type of lesion.

**Material and Methods:** The present study was carried out at a tertiary care center from October 2003 to January 2006. A total of 79 bone lesions were analyzed. A detail clinical and radiological history was taken. Bone biopsy was performed by either percutaneous method with needle/drill or Open surgical biopsy. If attached soft tissue was also received, bony tissues were put for decalcification (10% nitric acid) and soft tissue was immediately fixed into 10 % formalin and processed by paraffin embedding. Sections were stained by haematoxylin and eosin stain.

**Results:** Incidence of non-neoplastic and benign neoplastic lesions was 68.40% while that of malignant lesion was only 20.22%. Younger patients (58.24%) and males (59.49%) were more commonly affected. Amongst non-neoplastic lesions, tuberculous lesions (17.72%) were commonest while exostosis (15.19%) and osteosarcoma and chondrosarcoma were common benign and malignant neoplastic lesions respectively. Overall most common bone involved was femur. In tuberculous lesions, vertebrae were commonly involved. Osteolytic lesions were more common. Metaphysis was the commonest site.

**Conclusion:** Though bone tumours are less common lesions and pose a diagnostic problem, if viewed in perspective of clinico-radiology and histopathology, a correct diagnosis can be reached.

**Key-Words:** Bone Tumours; Clinico-Pathological Correlation

## Introduction

Definitive clinical diagnosis of bone lesion is often difficult. So it is essential to identify the lesion correctly before deciding the line of treatment, be it simple curettement, excision surgery, amputation or irradiation. For the correct diagnosis of bone lesions, charting out treatment plan and estimating prognosis, interpretation of biopsy material proves to be indispensable.<sup>[1]</sup>

Many inflammatory, neoplastic, degenerative and metabolic diseases occur in bones. They may affect children, adults or the elderly persons. They sometimes occur and develop quickly, often revealing themselves through pain, or the appearance of a palpable mass or by restricting the movement of the part involved.

Clinical symptoms alone are of relatively little significance in most bone lesions as most patients complain of pain or swelling or both. Such as

patient with Ewing's sarcoma may present with fever and increase erythrocyte sedimentation rate mimicking the diagnosis of osteomyelitis.<sup>[1]</sup> The roentgenogram can be considered as gross manifestation of bone lesion. It helps in defining exact location of lesion, but there are also limitations such as some primitive bone lesions like bone Ewing's sarcoma may appear as normal while some benign lesions like aneurysmal bone cyst or osteoblastoma may appear aggressive on roentgenogram. Biochemical investigations alone are also of not major value in the diagnosis of most of the bone lesions except in some cases as in myeloma.

## Materials and Methods

The present study was carried out at a tertiary care center from October 2003 to January 2006. A total of 79 bone lesions were analyzed. All the cases were studied prospectively in this study. A detail history of each patient regarding age, sex,

chief complaints, clinical examination and imaging finding were taken. The surgically resected specimens fixed in 10% formalin were received. At our set up, bone biopsy were performed by two methods: Percutaneous method with needle/drill and open surgical biopsy with a success rate of 5-84% and 96 % respectively.<sup>[2]</sup>

Bony along with soft tissue biopsy or in some cases amputated limb was received, and thorough gross examination of each lesion was done. Soft tissue of each biopsy was immediately fixed into 10 % formalin and processed by paraffin embedding. Bone from each biopsy was kept for decalcification in 10% nitric acid. After that, fixation in 10% formalin, processing and haematoxylin and eosin staining was performed. In some cases, like suspected small round cell tumour (Ewing's sarcoma), special stains like periodic acid schiff staining was also performed on tissue sections for confirmation.

**Results**

A histopathological study of various bone lesions was carried out at a tertiary care center from October 2003 to January 2006. During these 28 months, total 79 cases were studied prospectively. Non neoplastic lesions comprised 32 cases (41%), 22 cases (28%) had benign lesions and malignant lesions accounted for 20% (16 cases) while 9 cases (11%) were inconclusive. Bone lesions were more common in younger age group 11-30 years (58.24%). Males (47 out of 79 cases, 59.49%) were affected more commonly than females (32 out of 79 cases, 40.51%) with male to female ratio as 1.46:1.

Amongst non-neoplastic lesions, tuberculous lesions (14 cases, 17.72%) were commonest followed by chronic Osteomyelitis (9 cases, 11.39%) while exostosis (12 cases, 15.19%) was more common in the category of benign neoplastic lesions. Giant cell tumour (5 cases, 6.33%) was also reasonably common. Osteosarcoma and chondrosarcoma (4 cases of each, 5.05%) were common malignant neoplastic bone lesions. Osteosarcoma and chondrosarcoma were common in females while others were common in males in our study. Patients up to 30 years of age were more prone to tuberculous

lesions while chronic osteomyelitis was common in 11-20 years of age. Exostosis affected patients in their 3<sup>rd</sup> decade, giant cell tumour affected patients in their 4<sup>th</sup> decade, osteosarcoma was common in patients of 11-20 years of age and chondrosarcoma was common in 5<sup>th</sup> decade.

**Table-1: Incidence of Bone Lesions according to Age and Sex**

Age	Male	Female	Total (%)
0-10	5	4	9 (11.39)
11-20	15	12	27 (34.18)
21-30	12	7	19 (24.06)
31-40	3	3	6 (07.59)
41-50	2	2	4 (05.07)
51-60	4	2	6 (07.59)
>60	6	2	8 (10.12)
Total	47	32	79

**Table-2: Incidence of Bone Lesions according to Histological Subtypes**

Histological Subtype	Age in years							Gender		Total
	0-10	11-20	21-30	31-40	41-50	51-60	>60	Male	Female	
<b>Non-neoplastic bone lesions</b>										
Chronic Osteomyelitis	1	4	1	2	1	0	0	8	1	9
Tuberculous lesion	3	4	4	0	1	2	0	6	8	14
Brodies abscess	0	1	0	0	0	0	0	1	0	1
Nonspecific inflammation	0	0	1	0	1	0	2	2	2	4
Foreign body reaction	0	0	0	0	1	0	0	1	0	1
Avascular necrosis of hip- Sickled RBCs	0	1	1	0	0	0	1	2	1	3
<b>Neoplastic bone lesions</b>										
Chondroma	0	0	0	0	0	0	1	1	0	1
Chondroblastoma	0	1	0	0	0	0	0	1	0	1
Chondrosarcoma	0	1	0	0	0	2	1	1	3	4
Osteochondroma (Exostosis)	2	4	6	0	0	0	0	9	3	12
Osteoma	0	1	0	0	0	0	0	1	0	1
Osteosarcoma	0	3	1	0	0	0	0	0	4	4
Ewing's sarcoma/PNET	1	0	0	0	0	0	0	1	0	1
Giant cell tumour	0	1	1	2	0	0	1	2	3	5
Chondromyxoid fibroma	0	0	0	1	0	0	0	0	1	1
Chordoma	0	0	0	0	0	0	1	1	0	1
<b>Tumour like conditions</b>										
Metaphyseal fibrous defect	0	1	0	0	0	0	0	0	1	1
Fibrous dysplasia	0	1	0	0	0	0	0	0	1	1
Myositis ossificans	0	1	0	0	0	0	0	1	0	1
Giant cell reparative granuloma	0	1	0	0	0	0	0	0	1	1
Aneurysmal bone cyst	0	0	1	0	0	0	0	1	0	1
Subchondral cyst	0	0	0	0	0	1	0	1	0	1
Secondary (Mets) in bone	0	0	0	0	0	0	1	1	0	1
Inconclusive	2	2	3	1	0	1	0	6	3	9
Total	9	27	19	6	4	6	8	47	32	79

Metaphysis of long bones was the commonest site of involvement. Non neoplastic bone lesions affected metaphysis of long bones commonly.

Chronic osteomyelitis commonly affected femur while vertebrae was affected more commonly in tuberculous lesion. Metaphysis of femur was the preferred site for many malignant lesions except Giant cell tumour which affected epiphysis in most cases. Osteolytic lesions were more common than osteosclerotic lesions.

**Table-3: Distribution of Bone Lesions according to Location and Site**

Lesion	Bone Involved				Epiphysis	Metaphysis	Diaphysis	Other	Total
	Femur	Tibia	Humerus	Small bones					
Osteosarcoma	3	1	0	0	0	4	0	0	4
Osteochondroma (Exostosis)	8	1	1	2@	0	10	0	2	12
Giant cell tumour (GCT)	4	0	1	0	4	1	0	0	5
Chronic osteomyelitis	5	2	1	1#	3	5	1	0	9
Tuberculous lesion	2	0	2	10\$	1	6	0	7	14
Avascular necrosis of hip-Sickled RBCs	3*	0	0	0	0	0	0	3	3

\* Head; @ rib, scapula; # thumb; \$ Spine (6), finger (2), radius (1), hip (1)

**Table-4: Distribution according to Radiological Picture**

Lesion	Osteolytic Lesion	Osteosclerotic Lesion
Osteosarcoma	2*	2**
Osteochondroma (Exostosis)	3	0
Giant cell tumour (GCT)	5	0
Chronic osteomyelitis	0	9
Tuberculous lesion	14	0

\* Telangiectatic Periosteal; \*\* Periosteal Chondroblastic

## Discussion

Bone lesions themselves constitute a small fraction of all the lesions prevailing in a population. It is absolutely essential to be equipped with information regarding the clinical details viz. age, gender, site and radiological findings before diagnosis of any bone lesion. Certain entities can be confused clinically like osteomyelitis and ewing's sarcoma, traumatic fracture or pathological fracture, osteoblastoma and osteosarcoma and tuberculosis or malignancy. Therefore, histological diagnosis is must in all bone lesions to differentiate above mentioned entities, to confirm the diagnosis of radiologist and clinician and to predict the prognosis of bone lesion on the basis of different cytomorphological criteria. The present study was undertaken with a view to find out incidence of bone tumours and tumour like conditions in this part of Gujarat and to find out common type of lesions and tumours.

In present study, bone lesions were seen in younger age group (<30 years). Males were more commonly affected. Femur (metaphysis) was most common bone involved. Metaphysis was the commonest site of localization of most of bone lesion. Epiphysis was commonly involved in Giant cell tumour. Osteolytic lesions were commoner than osteosclerotic ones.

Primary bone tumours were more common than secondaries.<sup>[3,5,8-14]</sup> Non neoplastic and benign lesions were more common than malignant lesions. Tuberculosis was most common non neoplastic condition affecting 14 patients (17.72%). Tuberculous spine was the most common presentation. Other non-neoplastic condition was chronic osteomyelitis in which femur was affected.

Benign cases were more common as compared to malignant cases similar to other studies.<sup>[3-5,8-15]</sup> Osteochondroma was most common neoplastic benign condition.<sup>[8-15]</sup> Femur was commonly affected (66.67%). Males are affected more than females. Others benign tumours were chondroma, osteochondroma, osteoma and chondromyxoid fibroma. In malignant lesion, osteosarcoma and chondrosarcoma were common. Osteosarcoma was the most common primary malignant tumour and affected femur in 75% cases. Others also reported similar findings.<sup>[4,6,8-15]</sup> Other malignant bone lesions included Ewing sarcoma, Chordoma and giant cell tumour. Giant cell tumours were more common in 3<sup>rd</sup> decade, females were commonly affected and femur was the most common site similar to other study.<sup>[7]</sup>

Tumour like conditions included subchondral cyst, aneurysmal bone cyst, giant cell reparative granuloma, myositis ossificans, fibrous dysplasia and metaphyseal fibrous defect.

## Conclusion

In our study, benign lesions (non-neoplastic and neoplastic) were more common (68.40%) than malignant lesions (20.22%). Bone lesions were more common in younger age group 11-30 years. Males were more commonly affected than females. Tuberculous lesion affecting bone was the most common non neoplastic lesion, followed

by chronic osteomyelitis. In case of neoplastic lesions, exostosis was commonest benign tumour. Amongst malignant lesions, osteosarcoma and chondrosarcoma were common. Femur was the most frequently preferred location, but tuberculous lesions were seen in vertebrae. All the lesions were quite consistent in their occurrence with relation to age, sex and site of distribution and show little deviation from the usual behaviour in this respect.

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