



HISTOPATHOLOGICAL STUDY OF BONE LESIONS - A 4 YEARS STUDY OF 74 CASES IN A TERTIARY CARE HOSPITAL OF NORTH-EAST INDIA

Histopathology

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ABSTRACT

Background: A bone lesion is any process that replaces normal healthy bone with abnormal bone or tissue. The abnormality will fall along a spectrum ranging from tissue that closely resembles to normal bone and which are no cause for alarm, to that which is very distinct from bone and worthy of further investigation to determine a diagnosis and guide treatment. A major categorization of a lesion is whether it is benign or malignant. A spectrum of pathological bone lesions can be presented in any form from inflammatory to neoplastic conditions. Diagnosis of all bone lesions is made by radiological modalities like plain X-ray, CT scan, MRI and bone scintigraphy and finally by histopathological examination. **Aim and Objectives:** To study histopathological features of bone lesions and correlate them with age, sex and type of lesions. **Material and Methods:** The study was carried out at Agartala Government Medical Collage and GBP Hospital, a tertiary care center of Tripura, a small Northeastern state of India, from January 2018 to December 2021. A total of 74 bone lesions were analyzed. Bone biopsy was performed after detailed clinical and radiological examination. After fixation, decalcification, processing and H&E staining, histopathological diagnosis was made. **Results:** Out of all 74 cases, 43.25% bone lesions were found between 10-30 years with male predominance. The incidence of non-neoplastic lesions was 45.94% and neoplastic lesions were 54.05%. Amongst neoplastic lesions, incidence of benign tumors was 75 % and malignant tumors were 25%. Inflammation was most common non neoplastic lesion while osteochondroma was common among benign tumors and Secondary metastasis, osteosarcoma and Chondrosarcoma were equally common among malignant bone tumors. **Conclusion:** Close co-operation among the pathologist, radiologist and orthopedic surgeon to arrive at a correct diagnosis of bone lesion is necessary. The pathological diagnosis is still the crucial determining factor in planning appropriate treatment.

KEYWORDS

Bone lesions, Cyst, Metastasis, Tumors.

INTRODUCTION

A bone lesion is any process that replaces normal healthy bone with abnormal bone or tissue. The abnormality will fall along a spectrum ranging from tissue that closely resembles normal bone and which are no cause for alarm, to that which is very distinct from bone and worthy of further investigation to determine a diagnosis and guide treatment. A spectrum of pathological bone lesions can be presented in any form inflammatory to neoplastic conditions. It is important to remember, however, that some benign processes such as osteomyelitis can mimic malignant tumors, and some malignant lesions such as metastases or myeloma, can mimic benign. It is difficult to determine radiologically with plain film imaging whether a bone lesion is benign or malignant. The pathological diagnosis is still the crucial determining factor in planning appropriate treatment. Diagnosis of all bone lesions is made by radiological modalities like plain X-ray, CT scan, MRI and bone scintigraphy and finally by histopathological examination.

Inflammatory condition includes pyogenic osteomyelitis, tubercular osteomyelitis. Benign lesions includes simple bone cyst, aneurysmal bone cyst, osteochondroma (exostosis), enchondroma, giant cell tumour, fibrous dysplasia, osteoblastoma, chondroblastoma, non-ossifying fibroma etc. Malignant primary tumours of bone includes osteosarcoma, chondrosarcoma, Ewing sarcoma etc. Bone is the third most common site of metastatic disease. Primary sites like lung, kidney, thyroid, breast, gastrointestinal and melanomas produce mainly lytic lesion while others elicit mixed lytic and sclerotic reaction. Carcinomas are much more likely to metastasize to bone than sarcomas

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MATERIAL AND METHODS

The study was carried out at Agartala Government Medical Collage and GBP Hospital, a tertiary care centre of Tripura, a small North-eastern state of India, from January 2018 to December 2021. Total 74 cases were selected and in all patients bone lesions were diagnosed radiologically. Total 74 bone lesions were analysed. In all patients X-ray had been taken while CT scan and MRI were done according to the

need and advice of orthopaedic surgeon. Pathological investigation included routine CBC, ESR and Urine examination in all patients while sputum, body fluid examination, Serum Calcium and alkaline phosphatase were done in selected cases. Bone biopsy was performed after detailed clinical and radiological examination. Biopsy was taken mainly by scraping method, incision and excision method. Histopathological examination was performed in all patients for the diagnosis of lesions. After fixation, decalcification, processing and H&E staining, histopathological diagnosis was made. After that all slides were examined under microscope, the final diagnosis was made into inflammatory, benign and malignant lesion accordingly. In selected cases IHC was performed to confirm histopathological findings.

RESULTS

Out of all 74 cases, 34 cases were non neoplastic and 40 cases were neoplastic, out of which 30 (75%) were benign and 10 (25%) were malignant. 32 cases were found between 10-30 years with male predominance (39 cases). The inflammatory lesion was most common (29.41%) non neoplastic lesion and cystic lesions are second most common (26.47%) non neoplastic lesion. While Osteochondroma were the commonest (33.33%) among benign tumors and Aneurysmal bone cyst (13.33%) and Osteoclastoma (13.33%) is in second position. Osteosarcoma, Chondrosarcoma and Secondary metastasis (30% each) were common among malignant bone tumors (Table – 1). Out of 74 patients, maximum number of cases that is 32 cases (43.24%) were found between 10-30 years. Next common age is between 30-50 years with 25 cases (33.78%) (Table – 2). Out of 74 patients 39 (52.7%) were male and 35 (47.3%) were female (Table – 3).

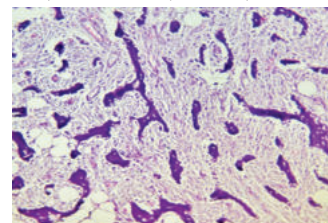


Fig 1: Osteosarcoma (10X)

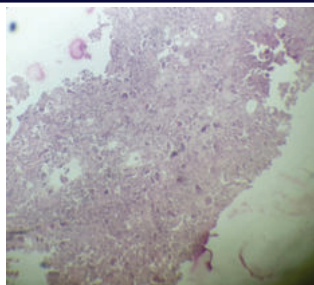


Fig 2 : Osteoclastoma (10X)

Table - 1: Proportion of different bone lesions.

Non neoplastic	Neoplastic	
	Benign	Malignant
Acute/chronic inflammation =10	Osteoclastoma=4	Metastasis =3
Osteomyelitis =5	Osteoma=1	Osteosarcoma =3
Cystic lesions (Bakers cyst/Bursal cyst) =9	Aneurysmal bone cyst=4	Chondrosarcoma=3
Rheumatoid arthritis=2	Osteochondroma /Exostosis =10	Ewing Sarcoma=1
Osteoarthritis=1	Pyogenic Granuloma=1	
Others= 7	Solitary fibrous tumors =1	
	Neurofibroma =3	
	Enchondroma =1	
	Osteoid osteoma=2	
	Ossifying fibroma=2	
	Fibrous dysplasia=1	
Total =34	Total =30	Total=10

Table - 2: Age distribution of the lesions of bone

Age	Non neoplastic	Neoplastic		Total
		Benign	Malignant	
<10 yrs	1	1	0	2
10-30 yrs	13	16	3	32
30-50 yrs	15	7	3	25
50-70 yrs	3	6	2	11
>70 yrs	2	0	2	4
Total	34	30	10	74

Table -3: Gender distribution of the lesions of bone.

Gender	Non neoplastic	Neoplastic		Total
		Benign	Malignant	
Male	14	19	6	39
Female	20	11	4	35
Total	34	30	10	74

DISCUSSION

The study was carried out at Agartala Government Medical Collage and GBP Hospital from January 2018 to December 2021. This study was carried out precisely to diagnose different lesions of bone. One of the important points to be considered is the age of the patient. Some of the bone lesions are most probably confined to certain age groups. metastasis is common in the middle aged and elderly, Ewing's sarcoma and simple bone cyst in the long bones of children and young teenagers, and giant cell tumor in the young to middle-aged adult. Most common age group of all bone lesions was 10-30 years, and second most common is 30-50 years. Slight male predominance is noted. Out of 74 patients 39 (52.7%) were male and 35 (47.3%) were female . The inflammatory lesion was most common and cystic lesions are second most common non neoplastic lesion. While Osteochondroma were the commonest among benign tumors and Aneurysmal bone cyst and Osteoclastoma is in second position. Osteosarcoma, Chondrosarcoma and Secondary metastasis were common among malignant bone tumors.

The peak incidence for bone lesions was between 10 to 50 years of age. Most metastatic bone tumors were found in older age above 40 years. Same findings were found in other studies done in other parts of the world [6-10]. In our study most bone lesions showed slight male predominance, with a male: female ratio of 1.1:1. Same findings were found in other studies done in other parts of the world. [6-8]

In our study, benign lesions are more common than malignant lesions, which is similar to the other studies [10-14].

In our study, Osteochondroma was the most common benign tumor similar to studies like in Manoja V, Divya Chevakula, Suresh K, et al 2019 [16] and Negash BE, Admasie D, Wamisho BL, Tinsay MW. [17]

In our study, Osteosarcoma, Chondrosarcoma and Secondary metastasis were common among malignant bone tumors which also similar to the other studies.

CONCLUSION

Bone lesions are very common radiological finding for Orthopedic surgeon in many patients. Even an Orthopedic surgeon and radiologist together will not be able to reach to the precise conclusion and further treatment. Close co-operation among the pathologist, radiologist and surgeon to arrive at a correct diagnosis of bone lesion is necessary. The pathological diagnosis is still the crucial determining factor in planning appropriate treatment.

Histopathology is the gold standard for the precise diagnosis from a very large number of conditions leading to bone lesions.

This present study helps us to understand the variety of bone lesions in a tertiary hospital in Tripura and gives an idea about the relative frequencies, age and sex.

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