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Histopathological Evaluation of Bone Tumours in a Teaching Hospital

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Abstract
Introduction: *Bone lesions often pose diagnostic challenges to surgical pathologists. In the WHO classification, most bone neoplasms are classified as either benign or malignant. Therefore, an integrated approach involving radiographic, histologic, and clinical data are necessary to form an accurate diagnosis and to determine the degree of activity and malignancy of each lesion.*
Materials and Methods: *This is a retrospective study conducted in the Department of Pathology (histopathology section) at MGM medical college, Indore during a period of 2 years, All the histopathological reports and slides of patients who had bone tissue biopsies were reviewed to provide relevant information on age, sex, histopathological interpretation, and the anatomical site of occurrence. Data tabulation and analysis was done to deduce the relative frequency of all observed parameters*
Results: *A histopathological study of various bone lesions was carried out during 2 years, total 55 cases were studied. Bone lesions were more common in < 20 years age group (47.27%). Non-neoplastic lesions comprised 30 cases (54.5 %), 12 cases (21.8 %) had benign lesions and malignant lesions accounted for 13 cases (23.6%). Males (38 out of 55 cases, 69.1%) were affected more commonly. Amongst non-neoplastic lesions, chronic osteomyelitis (15 cases, 50.0 %) were commonest while giant cell tumour (07 cases, 58.33%) was more common in the category of benign neoplastic lesions. Among malignant tumours, sarcoma accounts for 06 cases (osteosarcoma 06, and Ewing's sarcoma 05).*
Conclusion: *We conclude that the exact diagnosis of bone tumors is at times difficult. Therefore, an integrated use of clinical, radiological, and histopathological finding is recommended to increase accuracy of diagnosis and for better management of the patient.*

Introduction

Neoplasms and tumour like conditions of bone are rare. Thus, orthopaedic surgeons, radiologists, and pathologists generally have little experience with these lesions. Bone tumours also tend to affect young children and adolescents. Bone lesions often pose diagnostic challenges to surgical pathologists. In the WHO classification, most bone neoplasms are classified as either benign or malignant. Although a sharp distinction between these two categories is feasible in most of them, some neoplasm exhibit borderline and intermediate characterstics.[1]

Therefore, an integrated approach involving radiographic, histologic, and clinical data are necessary to form an accurate diagnosis and to determine the degree of activity and malignancy of each lesion. A proper histopathological diagnosis is useful in confirming the diagnosis and helps in staging the tumour and aid the surgeon in planning limb salvage surgery for early malignant and benign bone lesions.[2] Many inflammatory, neoplastic, degenerative and metabolic diseases occur in bones. Common presentations are progressive pain, swelling, tenderness and in some cases, acute pathological fracture.[3,4]

The present retrospective study was carried out to assess the patterns of various bone lesions and their relative frequency among already existing data of 55 patients whose biopsy specimens were received in the Department of Pathology at MGM medical college , Indore during a period of 2 years (January 20015-December 2017).

Materials and Methods

This is a retrospective study conducted in the Department of Pathology (histopathology section) at MGM medical college, Indore during a period of 2 years (January 20015-December 2017). All the histopathological reports and slides of patients who had bone tissue biopsies were reviewed to provide relevant information on age, sex, histopathological interpretation, and the anatomical site of occurrence. Data tabulation and analysis was done to deduce the relative frequency of all observed parameters. All tumors of hematopoietic and odontogenic origin were excluded in this study.

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, section cutting and haematoxylin and eosin staining was performed.

Results

A histopathological study of various bone lesions was carried out at a teaching hospital from 2015 to 2017. During these 2 years, total 55 cases were studied. Bone lesions were more common in < 20 years age group (47.27%). Non-neoplastic lesions comprised 30 cases (54.5 %), 12 cases (21.8 %) had benign lesions and malignant lesions accounted for 13 cases (23.6%). Males (38 out of 55 cases, 69.1%) were affected more commonly than females (17 out of 55 cases, 30.9 %) with male to female ratio as 2.2:1.[Table-1]

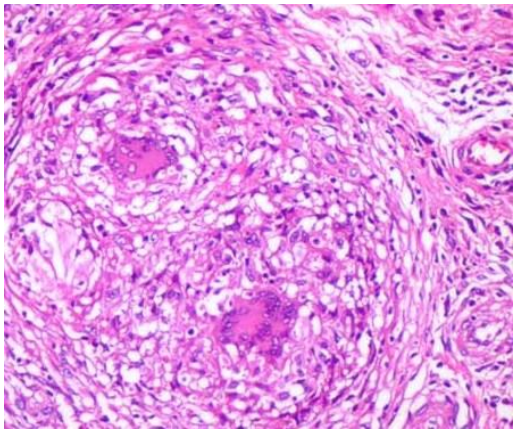
Amongst non-neoplastic lesions, chronic osteomyelitis 15 cases, 50.0 %) were commonest followed by tuberculous Osteomyelitis (09cases, 30.0 %) [Fig-1]and aneurysmal bone cyst (01 cases, 6.66 %) while giant cell tumour (07 cases, 58.33%) [Fig-2] was more common in the category of benign neoplastic lesions. Among malignant tumours, sarcoma accounts for 06 cases (osteosarcoma 06, and Ewing's sarcoma 05).[Table-3] [Fig-3]The most common site of occurrence of tumor was in the femur 32(58.18 %) followed by tibia 12 (21.8 %).[Table-4]

Discussion

The present study was undertaken with a view to find out incidence of bone neoplastic and non-neoplastic bone conditions in patients presenting to a teaching hospital and to find out common type of lesions and tumours. out of the 55 bone specimens received during the study , bone lesions were most commonly seen in younger age group (<20 years). [Table-2] Males were more commonly affected. Most tumours of the bone showed male preponderance with male to female ratio of 2.2:1. Similar findings were reported in other studies.[5-7]

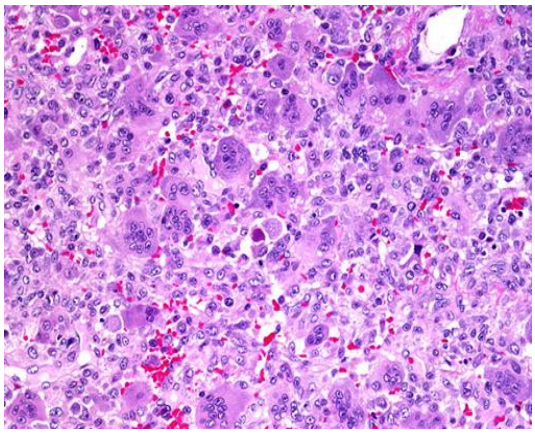
Non neoplastic lesions were found to be more common than neoplastic lesions which is in against conformity with studies done by Settakom et al.,[8]

Figure-1



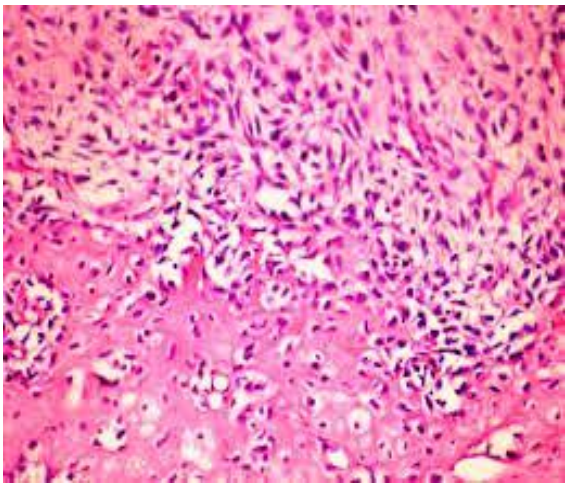
High power view histopathology Tubercular osteomyelitis

Figure-2



High power view histopathology Giant cell tumour

Figure-3



High power view histopathology Osteosarcoma

Table 1 Gender wise Distribution of the Lesions of Bone

Bonelesions	**NonNeoplastic**	**Neoplastic**		**Total**
		Benign	**Malignant**	
Male	20	9	9	38
Female	10	3	4	17
Total	**30**	**12**	**13**	**55**

Table 2 Age wise Distribution of the Bone Lesions

Age	**NonNeoplastic**	**Neoplastic**		**Total**
		Benign	Malignant	
<20	14	07	05	26
21-40	06	03	05	14
41-60	07	01	02	10
>60	03	01	01	05
Total	**30**	**12**	**13**	**55**

Table 3 Proportion of Different Bone Lesions

NonNeoplastic	Neoplastic	
	Benign	**Malignant**
Osteomyelitis–15	Giantcelltumour– 07	Osteosarcoma–06
Tubercularosteomyelitis–09	Chondroblastoma-01	Ewing'ssarcoma–05
Aneurysmalbonecyst–02	Enchondroma–02	Metastatic tumours-02
Simplecyst–01	Osteoma–01	
Fibrousdysplasia–02	Osteochondroma–01	
Non-ossifyingfibroma–01		
Total=30	**Total=12**	**Total=13**

Table 4 Distribution of Bone Lesions According to Site

Location	Non Neoplastic	Neoplastic	Total
Femur	18	14	32
Tibia	06	06	12
Humerus	02	02	04
Radius	01	01	02
Ulna	01	00	01
Smallbones	02	02	04
Total	**30**	**25**	**55**

Most tumors of the bone showed male preponderance with male to female ratio of 1.2:1. Similar findings were reported in other studies.[9-14]

Malignant bone tumors was found to be more common than benign.[9,13,17,19]. whereas, the reverse is true in other studies where Benign tumors were more common than malignant which are in conformity with other studies;[10,16,18] This disparity may be due to the fact that hematopoietic tumor is dealt by hematology section and are not included in our study.

Metastatic bone tumors were seen in older age group (above 50 years). In a study conducted by Sirikulchayanonta et al.,[20] there were similar findings with average age of 50 years in metastatic bone tumors.

Primary malignant bone tumors were more common than metastatic tumors which are in conformity with other studies;[8,14,15,21,22] whereas, the reverse is true for studies done by Gomez et al.,[18]

Giant cell tumor was found to be the commonest benign bone tumor. This corresponds to study done by Settakom et al.,[8]

The most common malignant bone tumor was osteosarcoma seven (46.9 %) of the 15 malignancies. Male preponderance was seen and long bones were commonly involved. Similar findings were observed in other studies.[8-10,12,14,15,17-19,22,23,24]

Conclusion

In our study, we have found that the pathology department (histopathological section) has reported spectrum of 14 different types of histopathological bone tumors during the study period of 2 years which indicate the presence of different types of bone tumors in general. All the lesions were quite consistent in their occurrence with relation to age, sex and site of distribution. We conclude that the exact diagnosis of bone tumors is at times difficult. Therefore, an integrated use of clinical, radiological, and histopathological finding is recommended to increase accuracy of diagnosis and for better management of the patient.

Conflict of Interests: There was no conflict of interests with respect to all authors.

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