

Histopathological Spectrum of Non-Neoplastic and Neoplastic Bone Lesions

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INTRODUCTION

- Bone consists of cartilage, osteoid, fibrous tissue and bone marrow elements. (1)
- Each tissue can give rise to benign or malignant tumours. (1)
- A spectrum of pathological bone lesions can present in any form from inflammatory to neoplastic conditions. (2)
- Bone tumours are classified on the basis of cell type and recognized products of proliferating cells. (1)
- Bone tumours may be primary which originate in the bone or secondary. (1)

Introduction

- Some benign processes such as osteomyelitis can mimic malignant tumours, hence histopathological examination aids more accurate results. (2)
- Though bone tumours are infrequently encountered compared to the occurrence of other neoplastic lesions, they are of great significance because majority of them affect adolescents and young adults with a tendency of aggressive course. (3)
- To establish an accurate diagnosis, an integrated approach in the form of clinical data, radiograph and histology is necessary. (2)

Aims and objectives

- Bone lesions exhibit a wide range of characteristics and their trends vary according to age, clinical features, and frequency of different histological types.
- The objective of this study is to investigate the clinical and pathological spectrum of bone lesions, focusing on their frequency, age, sex, anatomical distribution and histomorphological features.

MATERIALS AND METHODS

- This is a retrospective study conducted in Department of Pathology, Seveshram Hospital affiliated to Parul institute of medical sciences & research for a period of approximately 1.5 years from January 2024 to July 2025.
- Clinical case details, gross examination was recorded and histopathology slides of the cases in pertaining time period were reviewed.
- These were reviewed to provide relevant information on age, sex, histopathological interpretation, and

the anatomical site of occurrence.

- Data tabulation and analysis were done to know the relative frequency of the observed parameters.

RESULTS

- In this study, a total of 72 cases of bone specimen were taken after excluding non-diagnostic lesions, of which non neoplastic lesions (n = 45, 62.5%) were more common than neoplastic lesions (n = 22, 30.5%).

Table 1: Distribution of study subject based on the nature of lesions

Nature of lesion		Frequency (N = 72)	Percentage (%)
Non- neoplastic lesion		45	62.5%
Neoplastic Lesions (30.5%)	Benign	15	20.8%
	Malignant	7	9.7%
Tumour like lesions		5	6.9%

Results

Table 2: Showing non-neoplastic lesions in the present study

Histological lesion		Frequency (N = 45)	Percentage (%)
Tuberculous inflammation		25	55.5%
Osteomyelitis	Chronic osteomyelitis	17	37.8%
	Tuberculous osteomyelitis	03	6.7%

Out of the tuberculous lesions, Koch's spine was most common accounting for 20 cases.

Results

- In neoplastic lesion, benign tumours were more common (n = 15, 55.5%).
- In benign tumours osteochondroma was the most common followed by giant cell tumour.

Table 3: Showing histological classification of Benign bone tumours in the present study

Histological lesion	Benign tumours	Frequency (N = 15)	Percentage (%)
Cartilaginous tumours	Osteochondroma	06	40%
	Enchondroma	02	13.3%
	Chondroblastoma	02	13.3%
Giant cell tumour		04	26.7%
Giant cell tumour with aneurysmal bone cyst		01	6.7%

Results

Table 4: Table showing histological classification of malignant bone tumours in the present study

Histological lesion	Malignant tumours	Frequency (N = 07)	Percentage (%)
Osteogenic tumours	Osteosarcoma	03	42.8%
Ewing's sarcoma	Ewing's sarcoma	03	42.8%
Metastatic deposits	Prostatic adenocarcinoma	01	14.3%

Table 5: Showing histological classification of Tumour- like lesions of bone in the present study

Tumour like lesions	Frequency (N = 05)	Percentage (%)
Aneurysmal bone cyst	04	80%
Fibrous dysplasia	01	20%

Results

Table 6: Showing Age distribution of all bone lesions in the present study

Age group	Non-neoplastic lesions	Benign neoplastic lesions	Malignant neoplastic lesions	Tumour like lesion	Frequency (N = 72)	Percentage (%)
0-9	06	00	00	00	06	8.3%
10-19	10	07	06	03	26	36.1%
20-29	10	05	00	02	17	23.6%
30-39	07	02	00	00	09	12.5%
40-49	10	01	00	00	11	15.3%
50-59	02	00	00	00	02	2.7%
>/=60	00	00	01	00	01	1.3%

Most patients fall under the age group of 10-19 years followed by 20-29 years.

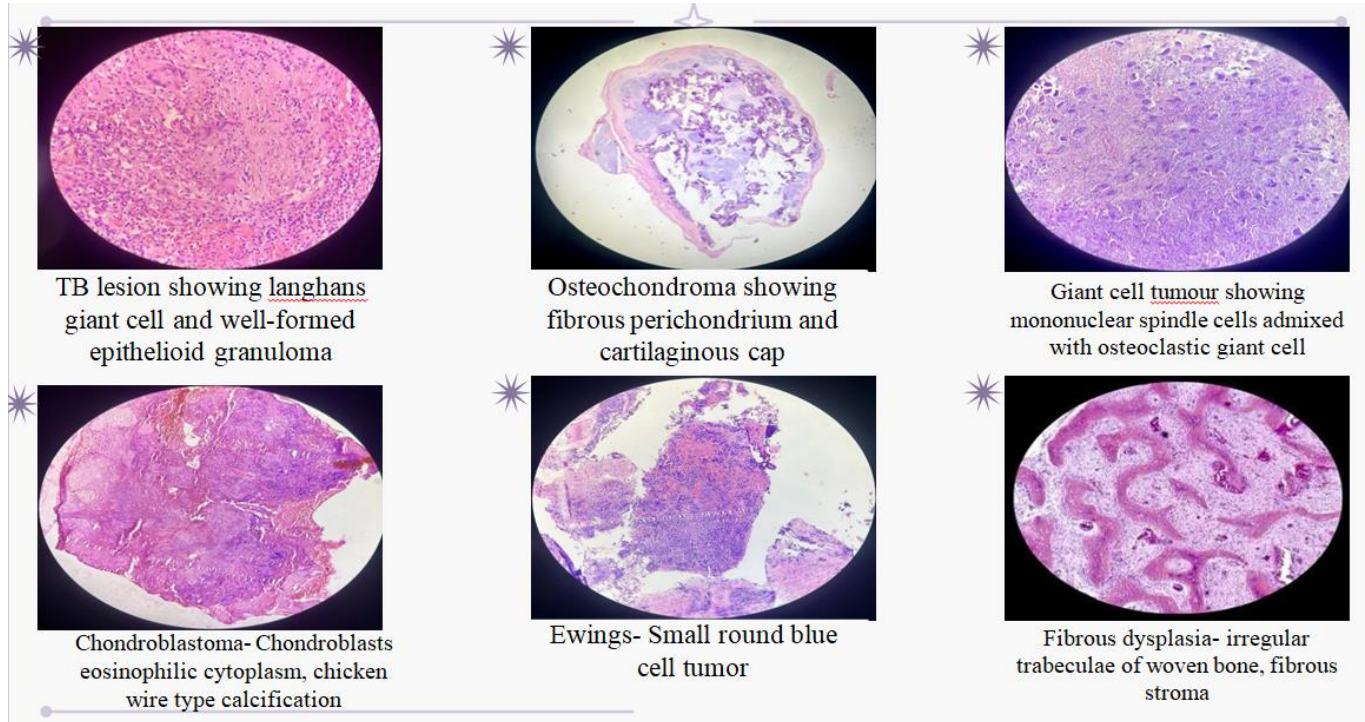
Results

Table 7: Frequency of type of bone lesion with affected bone

Nature of lesion	Bone affected				
	Femur	Tibia	Small bones	Humerus	Radius
Benign neoplastic lesions	05	03	05	01	01
Malignant neoplastic lesions	04	01	00	01	00

Tumour like lesion	04	01	00	00	00
Frequency	13	05	05	02	01

The most common bone affected was femur. However, in non neoplastic lesion Koch's spine was the most common followed by femur.



DISCUSSION

- In present study, the bone lesions were predominantly seen in under the age range of 10-19, 36.1% followed by 20-29, 23.6%. Similar findings were reported in other studies.(1, 2, 4, 5)
- The study had more male predilection with the male to female ratio of 1.5:1 in non- neoplastic lesions and 1.4:1 in neoplastic lesion with parallel findings in other studies. (1, 2, 4, 5)
- Pain was the most common clinical presentation followed by swelling, which is conformity with other study. (4)
- In present study, non neoplastic lesions were most common than neoplastic lesions.
- In non neoplastic lesions, tuberculous osteomyelitis was most common followed by chronic osteomyelitis.
- In neoplastic lesion, benign lesions were more common than malignant in which most frequent histological diagnosis was osteochondroma followed by giant cell tumour.

CONCLUSION

- The histopathological evaluation of bone lesions remains a cornerstone in accurate diagnosis and classification of both non-neoplastic and neoplastic conditions.
- Through careful examination of histomorphology, it is possible to differentiate between reactive, inflammatory, benign, and malignant processes.

- There was more male predilection in this study. The majority of the cases particularly malignant tumour were observed in adolescence.
- In present study we observed a diverse spectrum of bone lesions, 13 distinct forms and 72 cases at a single tertiary health care system. In which non-neoplastic was more common than neoplastic lesions. In neoplastic lesions benign were more common than malignant.

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