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Original Research Article

Histopathological Spectrum of Bone Lesions in a Tertiary Care Hospital

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Abstract

Background: Histopathology remains the key to diagnosis and management of bone lesions and the present study focuses on the relative frequencies of the various causes of bone lesions with respect to age and gender. ***Methods:*** The study was conducted as a combined retrospective and prospective study spanning over a 2 year period from 2018 to 2020. Consecutive bone specimens received in the Pathology Department were subject to histopathological examination and correlated with the demographic characteristics of the patient population. ***Results*:** Among the 105 specimens examined histopathology, non-neoplastic lesions were more common than neoplastic lesions (67 vs 38). Tuberculous osteomyelitis (n=22, 32.8%) was the most common non-neoplastic lesion. Osteochondroma (30.8%) and osteosarcoma (50%) are the commonest begin and malignant tumours respectively. ***Conclusion:*** Histopathology remains a gold standard for the diagnosis of bone lesions. Knowledge of the relative frequencies of various lesions with respect to age and gender is of paramount importance. This when combined with clinical and radiographic data helps in arriving at correct diagnosis.

Keywords: neoplastic, non-neoplastic, osteomyelitis, osteosarcoma, benign, malignant.

INTRODUCTION

Clinical diagnosis of bone lesions is often difficult. Hence clinicians often depend upon a combination of radiological and histopathological findings. Bone tumours are rare compared to tumours in other regions. However they commonly occur during the 4th and 5th decades causing considerable disability during the productive age groups. Bone tumours are difficult to differentiate from non-neoplastic lesions causing diagnostic difficulty in histopathological specimens. Diagnosis of bone tumours requires an integrated approach involving histopathologic, radiologic and clinical features [1]. The present study was carried to determine the frequencies of various neoplastic and non-neoplastic lesions involving the bone.

MATERIALS AND METHODS

The study was conducted as a combined retrospective and prospective study during the period from May 2018 to June 2020 at Karpaga Vinayaga Institute of Medical Sciences. Bone and soft tissue was obtained by the needle/drill or open surgical biopsy. Bone was decalcified with acid and the attached soft tissue was fixed with 10% formalin and processed by paraffin embedding. Tissue sections were stained by eosin and hematoxylin. The lesions are classified into inflammatory, benign or malignant lesions.

RESULTS

A total of 105 specimens were examined histopathological during the study. They were classified broadly into neoplastic or non-neoplastic lesions. Overall non neoplastic lesions are very common than neoplastic lesions (n=67 vs 38). Among the non-neoplastic or inflammatory lesions, tuberculous osteomyelitis (n=22, 32.8%) was a common cause followed by other causes like acute osteomyelitis, synovitis and bursitis. Osteochondroma (n=8, 30.8%) was the commonest begin tumour followed by Giant cell tumour, fibroma, pyogenic granuloma, etc. The most common malignant lesion involving the bone was osteosarcoma (n=4, 50%) forward by chondrosarcoma and metastatic lesions.

Bone lesions are more common in men than in women. In the present study the lesions are more common in the 3rd and 4th decades compare to other age groups.

Table-1: Frequency distribution of various histopathological diagnoses of bone specimens

Non- neoplastic/ Inflammatory	No (%)	Benign	No (%)	Malignant lesion	No (%)
Tuberculous osteomyelitis	22 (32.8)	Osteochondroma	8 (30.8)	Osteosarcoma	6(50)
Acute/chronic osteomyelitis	19 (28.4)	Gaint cell tumor	5 (19.2)	Chondrosarcoma	4(33.3)
Acute/chronic inflammation	18 (26.9)	Fibroma	2 (7.7)	Synovial sarcoma	1(8.3)
Bursitis	4 (6.0)	Pyogenic granuloma	2 (7.7)	Metastasis	1(8.3)
Synovitis	2 (3.0)	Solitary bone cyst	2 (7.7)		
Crystal deposition disease	2 (3.0)	Chondromyxoid fibroma	2 (7.7)		
		Neurofibroma	1 (3.8)		
		Schwanomma	1 (3.8)		
		Chordoma	1 (3.8)		
		Osteofibrous dysplasia	1 (3.8)		
		Aneurasymal bone cyst	1 (3.8)		
Total no of cases	67(100%)		26(100%)		12(100%)

Table-2: Gender Distribution of bone lesion.

Gender	Inflammatory	Benign lesion	Malignant lesion
Male	47	17	8
Female	20	9	4

Table-3: Age wise distribution of bone lesions

Age	Inflammatory	Benign lesion	Malignant lesion.
<25	10	12	1
25-35	20	9	2
35-45	12	3	4
45-55	8	1	4
>55	17	1	1

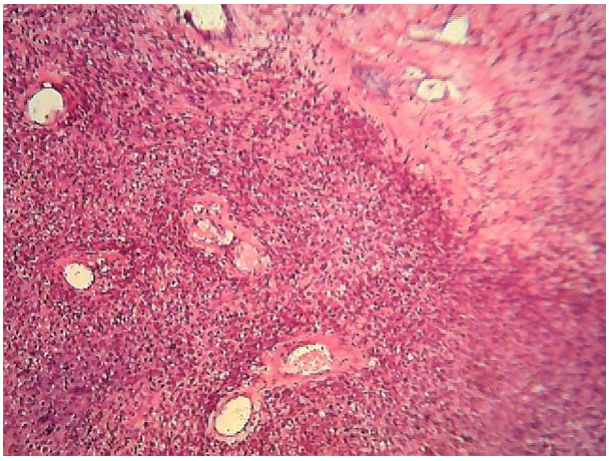

Fig-1: Osteosarcoma: tumour mass showing a cellular neoplasm composed of spindle shaped cells with features of cellular and nuclear pleomorphism

Fig-2: Osteosarcoma showing abundant osteoid production was noted at multiple foci

DISCUSSION

In the present study non-neoplastic lesions are more common than neoplastic lesions. This finding confirms with findings of Modi *et al*. [2], Sameer *et al*. [3], and George Mathew *et al*. [4]. Some studies like Manoja [5], Rhutso [6], Anitha [7] and Kethi [8] revealed neoplasm as the commonest lesion involving the bone.

Tuberculous osteomyelitis is the commonest non-neoplastic lesion in our study similar to Modi *et al*. [2]. Whereas chronic osteomyelitis is the commonest lesion in studies like Anita *et al*. [7], George Mathew *et al*. [4], Sameer *et al*. [3]. The other non-neoplastic causes include synovitis, bursitis, etc.

Osteochondroma is the most common benign tumour in our study similar to other studies like Leticia

et al. [9], Manoja *et al*. [5] and Rhutso *et al*. [6]. The second most common benign tumour was giant cell tumour in most of these studies. Whereas studies done by Anita *et al*. [7], George *et al*. [4] and Kethireddy *et al*. [8] revealed giant cell tumour as the commonest benign tumour followed by other tumors.

The commonest malignant tumour is osteosarcoma in our study. Studies done by Leticia *et al*. [9], Modi *et al*. [2], George Mathew *et al*. [4] and Rhutso *et al*. [6] also revealed osteosarcoma as the most common malignant tumor. In a study done by Anita *et al*. [7], chondrosarcoma was the the most common malignant tumor. In a large study done by Katchi *et al*. [10] in Kuwaiti population, Ewings sarcoma, multiple myeloma and osteosarcoma were the commonest malignant tumours in that order.

In overall bone lesions are more commonly found in men than women. Both benign and malignant lesions are more common in men than women as observed in most of the studies. The femur is the most common bone affected in most of the studies (Leticia *et al*. [9], Manoja [5], Rhutso [6], Anita [7]).Tumours are more common in the 3rd and 4th decade in the present study

CONCLUSION

There is a wide spectrum of bone lesions encompassing non-neoplastic and neoplastic lesions. Non-neoplastic lesions occur more frequently than neoplastic lesions. Tuberculous osteomyelitis is the commonest non neoplastic lesion. Osteosarcoma is the commonest malignant lesion encountered in the study. Combination of clinical and radiographic data with histopathological examination helps in making accurate diagnosis of bone lesions.

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