Original Article

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The Incidence and Age, Sex Distribution of Tumours and Tumour like Lesions of Bone

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Abstract

Introduction: Though bone tumours are infrequently encountered compared to the occurrence of other neoplastic lesion, they are of great significance because majority of them affect adolescents and young adults with a tendency of aggressive course. *Methodology:* The study was prospective and there was need to study various bone tumours and tumour like lesions of bone in the experience of the department of pathology, and hence study was conducted. All patients with clinical and radiological suspicion of primary and secondary tumours and tumour like lesions of the bone which require biopsy or surgical excision. *Results:* Out of 50 lesions studied, malignant bone tumours were 27 (54%) , benign tumours 16 (32%) and tumour like lesions 7 (14%). The ratio of benign to malignant bone tumours was 1 to 1.68. *Conclusion:* Benign bone tumours though common in general population are less often biopsied. Tumour like lesions more commonly present clinically as neoplastic lesion and also appear as tumours on X-rays.

Keywords: Bone Tumours; Histopathology; Tumour Like Lesions.

Introduction

The skeletal system is as vital to life as any organ system because it plays an essential role in mineral homeostasis, houses hemopoietic elements and provides mechanical support for movement also protects and determines the attributes of body and shape. This system is as subject to circulatory, inflammatory, neoplastic, metabolic and congenital disorders as are the other organ systems of the body [1].

Bone tumours are diverse in size, gross, histological features and range in their biologic potential from the innocuous to the rapidly fatal. This diversity makes it critical to diagnose tumours correctly, stage them accurately and treat them appropriately, so that the patients can not only survive, but also maintain optimal function of the attached body parts [2].

One must view the tumours of the bone as clinicopathological entities. The clinical features are helpful in narrowing down the diagnostic possibilities in accordance with the age of the patient, duration of the complaints, the particular bone or area of the bone affected etc [3].

Although the skeletal system is a common site of involvement by metastatic carcinoma as well as myeloma and lymphoma, primary tumours of bone are rare, accounting for only 0.2% of all neoplasms [4].

Though bone tumours are infrequently encountered compared to the occurrence of other neoplastic lesion, they are of great significance because majority of them affect adolescents and young adults with a tendency of aggressive course [5].

These tumours can prove to be most lethal with extensive metastasis. Many tumour like lesions present as neoplastic conditions clinically as well as on radiologic examination. Morphological diagnosis of bone tumour and tumour like lesions is highly challenging which has to have collateral data of clinical and radiological features [6].

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The roentgenographic picture provides a sort of blue print of the gross pathology of the lesion. In specific the roentgenographic picture reveals,

1. Where the lesion is located in relation to the bone as a whole.
2. What the lesional tissue has done to the original osseous tissue at the site of development of the tumour and often permits one to deduce a good deal of information about the gross character of the lesional tissue itself [7].

The histological tissue pattern remains of course, the decisive factor in the diagnostic interpretation of any particular lesion. Judgement should be based on the dominant histologic appearances as determined by examination of the tissue areas from various parts of the lesion. Local variations in the histologic pattern and tissue elements not indigenous to the lesion may be encountered and this is to be recognised [8].

Methodology

The materials for the present study included biopsies of bone tumour and tumour like lesions submitted for histopathological examination to the department of Pathology. The study was conducted for 24 months subject to inclusion and exclusion criteria. The study was prospective and there was need to study various bone tumours and tumour like lesions of bone in the experience of the department of pathology, and hence study was conducted.

All patients with clinical and radiological suspicion of primary and secondary tumours and tumour like lesions of the bone which require biopsy or surgical excision.

Exclusion Criteria

1. Patients with haematopoietic tumours
2. Patients with tumours of the joints.

The patients were briefed about the nature of the study and a written informed consent was obtained from the selected patients.

Biopsy specimens were fixed in 10% formalin for 24 hrs after recording the gross morphological features. Specimen was sampled carefully and bone tissue was cut with hand and electrical saw in to thin slices. Samples containing bone tissue were decalcified before routine processing and paraffin embedding. Sections were cut at 4-5µ thicknesses with microtome and stained routinely with Haematoxylin and Eosin. Special stains were done when necessary and these included Priodic Acid Schiff, Von Kossa and Reticulin stains.

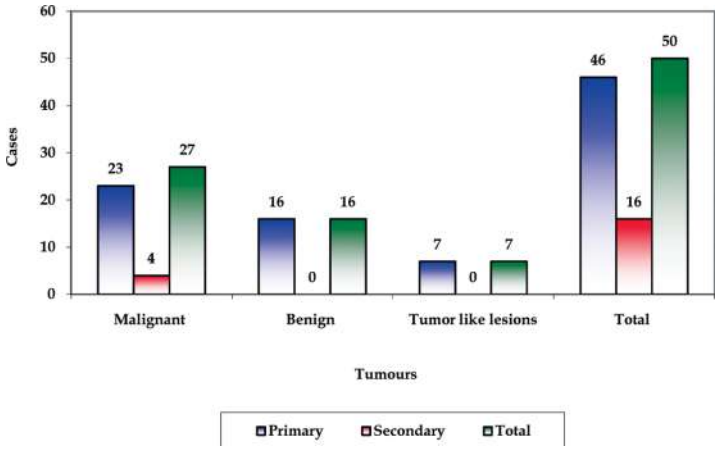
Results

Out of 50 lesions studied, malignant bone tumours were 27 (54%) , benign tumours 16 (32%) and tumour

Table 1: Table showing classification of bone lesions based on behaviour and origin in the present study

Behavior of tumours	Primary	Secondary	Total
Malignant	23	04	27 (54%)
Benign	16	--	16 (32%)
Tumour like lesions	07	--	07 (14%)
TOTAL	46 (92%)	04 (8%)	50

Benign:Malignant = 1:1.68



Graph 1: Classification of bone lesions based on behaviour and origin in the present study

like lesions 7 (14%). The ratio of benign to malignant bone tumours was 1 to 1.68 (Table 1).

The lesions were further classified based on origin, whether primarily arising within bone or secondarily involved. There were 46 (92%) primary and 4 (8%) secondary bone tumours (Table 1).

Age

The age distribution of all bone tumour and tumour like lesions in the present study shows that a maximum of 12 (24%) were in the 15-19 years age group followed by 9 (18%) in 25 to 29, 6 (12%) in 20 to 24, 4 (8%) each in 10 to 14 and 50 to 54, 3 (6%) each in 30 to 34,35 to 39 and 5to 9, 2 (4%) each in40 to 44 and 45 to 49 and 1 (2%) each in 55 to 59 and above 60. The mean age range for all bone tumours was from 5 to 62 years with mean age of 26.64 ± 13.81 years (Table 2).

Gender

In the present study there were 28 (56%) Males and 22 (44%) Females (Table 2).

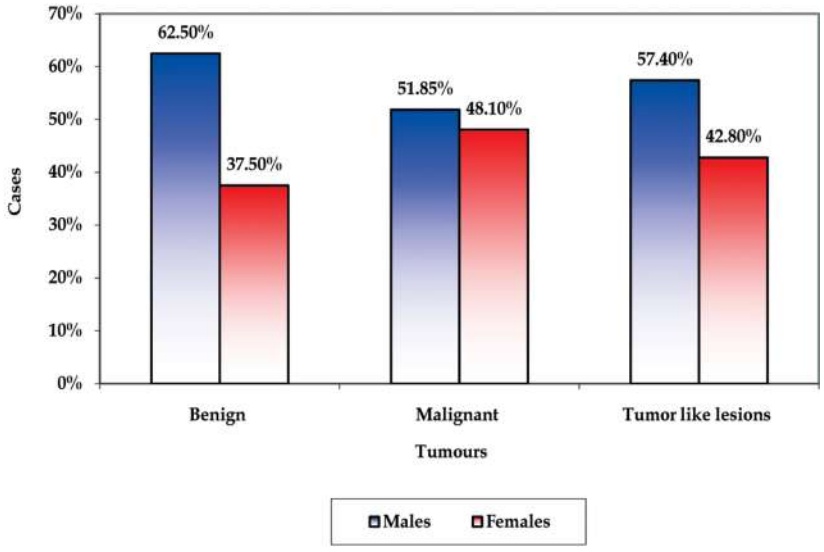
Based on the behaviour of bone lesions when age and gender distribution were analysed, it was found that mean age (age ± 1 SD) of occurrence for benign bone tumours was 22.93 ± 11.60 years, for malignant

Table 2: Table showing Age and gender distribution of all bone lesions in the present study

Age in groups	Sex		Total
	Males	Females	
5-9	2	1	3 (6%)
10-14	3	1	4 (8%)
15-19	8	4	12 (24%)
20-24	6	0	6 (12%)
25-29	3	6	9 (18%)
30-34	2	1	3 (6%)
35-39	1	2	3 (6%)
40-44	1	1	2 (4%)
45-49	0	2	2 (4%)
50-54	0	4	4 (8%)
55-59	1	0	1 (2%)
>60	1	0	1 (2%)
Total	**28**	**22**	**50**

Table 3: Table showing the age and gender distribution based on behaviour of bone lesions in the present study

	Benign	Malignant	Tumour like lesions
Males	10 (62.5%)	14 (51.85%)	4 (57.4%)
Females	6 (37.5%)	13 (48.1%)	3 (42.8%)
Male:Female	1.66:1	1.07:1	1.33:1
Mean age (Years)	22.93 ± 11.60	31.66 ± 14.02	15.71 ± 8.95



Graph 2: Classification of bone lesions based on behaviour and origin

bone tumours 31.66 ± 14.02 and for tumour like lesions 15.71 ± 8.95 years.

Discussion

The knowledge of age of the patient is fundamental for the correct interpretation of bone neoplasms. The propensity of any specific variety of tumor to affect infants, children, adolescents, young or middle-aged adults, or the elderly represents one of the most characteristic features of many tumors and tumor-like lesions of the skeleton [9].

Table 4: Table showing comparison of age distribution of present study with other studies

Age groups in decade	Nayar M (1979) (n=411)		Jayaram R (1997) (n=81)		Present study (n=50)	
	No.	%	No.	%	No.	%
1st decade	58	14.1%	8	9.9%	3	6%
2nd decade	155	37.7%	27	33.3%	19	38%
3rd decade	94	22.9%	25	30.9%	14	28%
4th decade	59	14.3%	8	9.9%	6	12%
5th decade	23	5.6%	4	4.9%	3	6%
6th decade	15	3.6%	4	4.9%	4	8%
7th decade	7	1.8%	5	6.2%	1	2%
Total	411		81		50	

Table 5: Table showing comparison of gender distribution from present study and other studies

Studies	Male to Female ratio of bone lesion		
	Benign	Malignant	Tumor like lesions
Nayar M (1979)	2:1	1.5:1	1.8:1
Jayaram R (1997)	1.6:1	1.6:1	3.2:1
Present study	1.6:1	1.07:1	1.3:1

Age distribution of all bone lesions from the present study show that majority of the lesions occurred in the 2nd decade of life constituting 38% of cases similar to observations by Nayar M (37.7% of cases in 2nd decade) and Jayaram R (33.3% in 2nd decade) [2,10].

Male preponderance was seen with benign and malignant bone tumors in the present study showing 1.6:1 and 1.07:1 male female ratio respectively. This observation was similar to that of Nayar M (B=2:1, M=1.5:1) and Jayaram R (B=1.6:1, M=1.6:1) [2,10].

Among the tumor like lesions in the present study the male to female ratio was 1.3:1 and both Nayar M (1.8:1) and Jayaram R (3.2:1) showed male preponderance among tumor like lesions [2,10].

Conclusion

Bone tumours form an important neoplastic lesion during the period of active growth spurt in adolescents and young adults. Clinically malignant tumours present with short duration of complaints showing rapid growth of tumour.

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