

Anatomic Location, Age, Gender and Staging of Osteosarcoma Patients Presenting to a Tertiary Care Centre

Varun Sachdeva¹, Richa Mehra²

¹MS Orthopaedics, Zonal Hospital Mandi (H.P.)

²MS ENT Zonal Hospital Mandi (H.P.)

Corresponding Author: Richa Mehra

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ABSTRACT

Osteosarcoma is a high grade primary skeletal malignancy characterised by spindle cells of mesenchymal origin depositing immature osteoid matrix. With an annual incidence rate of 3.1 cases per million in the US, Osteosarcoma accounts for less than 1% of all newly diagnosed cancer in adults and 3-5% of those in children, but it is the most common malignancy in adolescents outside of leukemia and lymphoma. In India, the incidence varies from 4.7% to 11.6%, where this malignancy is associated with significant morbidity and mortality. Our study shows that Age distribution histogram shows a bimodal distribution. We observed that the most common site of osteosarcoma is around the knee joint in proximal tibia and distal femur. In our study we found that the tumour has higher prevalence in males than females. Most of the patients presented to us at Enneking stage 2b and AJCC stage 2a and 2b.

Keywords: AJCC-American Joint Commission on Cancer

INTRODUCTION

Osteosarcoma is the most common sarcoma of bone. Osteosarcoma is a high grade primary skeletal malignancy characterized by spindle cells of mesenchymal origin depositing immature osteoid matrix. Osteosarcoma has a bimodal age distribution. The initial peak is in the 10 to 14 year age group, corresponding to the pubertal growth spurt. Osteosarcoma accounts for approximately 2.4% of pediatric cancers,

making it the eighth most common childhood malignancy.¹ In the 0 to 14 year age range, the incidence rate of osteosarcoma in all races and genders is four cases per year per million people (3.5 to 4.6, 95% confidence interval). This number rises to five cases per year per million people (4.6 to 5.6, 95% confidence interval) for the range 0 to 19 year age range. The next observable peak is in adults older than 65, when the appearance of osteosarcoma is more likely to represent secondary cancer resulting from malignant degeneration of Paget disease, sites of bone infarction, etc. The incidence of osteosarcoma has historically been reported as higher in males than in females, with an incidence rate of 5.4 cases per year per million males and 4 cases per year per million females, respectively.¹ Osteosarcoma develops in adolescents most often at the metaphysis of lower extremity long bones which suggest relationship between the hormonal changes of puberty and/or physiologic bone growth and the pathogenesis of osteosarcoma.

The aim of the study is to determine the anatomic site, age, gender and the staging of Osteosarcoma at the time of presentation to our tertiary care Hospital.

LITERATURE REVIEW

Osteosarcoma accounts for less than 1% of all newly diagnosed cancer in adults and 3-5% of those in children, but it is the most

common malignancy in adolescents outside of leukemia and lymphoma.² Osteosarcoma is the most common primary malignant bone tumour in children and adolescents, accounting for 4% of all childhood cancers worldwide. In India, the incidence varies from 4.7% to 11.6%, where this malignancy is associated with significant morbidity and mortality. With approximately 44.4% of patients with primary bone tumours being of age less than 34 and 67.9% of the patients being of age less than 54 years.⁴

Osteosarcoma has a bimodal age distribution, with a first peak during the second decade of life and the second peak in older adults.⁵ Osteosarcoma develops in adolescents most often at the metaphysis of lower extremity long bones which suggest relationship between the hormonal changes of puberty and/or physiologic bone growth and the pathogenesis of osteosarcoma. The most common location for osteosarcoma is around the knee i.e. distal femur, proximal tibia and proximal humerus.⁵

MATERIALS & METHODS

Patients with biopsy proven cases of Osteosarcoma presenting to Government Medical College and Hospital, Chandigarh were enrolled in the study to analyze the anatomic location, age, gender and stage of Osteosarcoma. During the study period of 2 years 2017-2018, 25 patients were assessed with respect to these variables.

RESULT

The mean age of our study group was 23.48 years (range 13 to 64 years)(Table 1). Age distribution histogram shows a bimodal distribution.

Out of 25 patients we enrolled, 20 were male (80%) and 5 were females (20%)(Table 2)

Table 1. Age wise distribution of patients

AGE GROUPS	10-15	16-20	21-25	26-30	>30
NUMBER OF PATIENTS	8	7	2	2	6

Table 2. Gender distribution of patients

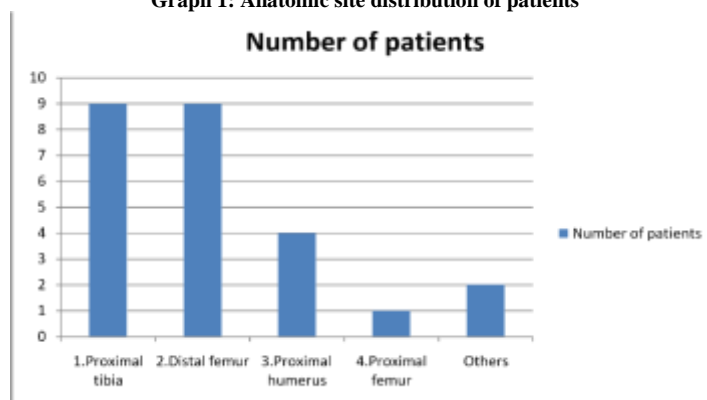
Gender	Number of patients	Percentage
Male	20	80%
Female	5	20%
Total	25	100%

The most common site of osteosarcoma in our study was found to be around knee with 9 patients (36%) having proximal tibia, 9 patients (36%) having distal femur as the site of involvement, 4 patients (16%) and 1 patient (4%) had involvement of proximal humerus and proximal femur respectively. Two patients (8%) had diaphyseal involvement (Table 3 and Graph 1).

Table 3: Anatomic site distribution of patients

Site	Number of patients	Percentage
1.Proximal tibia	9	36%
2.Distal femur	9	36%
3.Proximal humerus	4	16%
4.Proximal femur	1	4%
5.Others	2	8%
Total	25	100%

Graph 1: Anatomic site distribution of patients



Tumour staging of patients was done according to the Enneking and American Joint Committee on Cancer (AJCC) We found

that 12 patients (66.7%) were Enneking stage 2b and 5 patients (27.8%) were having Enneking stage 2a, 1 patient was in Enneking

stage 3. Data was not available for 7 patients. According to the AJCC staging, the number of patients in stage 2a was 9 (50%), stage 2b was 8 (44.4%), while 1 patient (5.5%) each was in stage 4.

Table 4: Enneking staging of osteosarcoma patients

Enneking Staging	Total patients	
	Total Number	Percentage
1a	0	0%
1b	0	0%
2a	5	27.8%
2b	12	66.66%
3	1	5.55%
Total	18	

Table 5: AJCC Staging of the osteosarcoma patients.

AJCC	Total patients	
	Total Number	Percentage
1a	0	0%
1b	0	0%
2a	8	44.44%
2b	8	44.44%
3	0	5.55%

DISCUSSION

We observed that the most common site of osteosarcoma is around the knee joint. Malawer et al. concluded that Osteosarcoma is the most common type of malignant bone tumour in the region of the knee.⁶ We find that the age distribution histogram shows a bimodal distribution. Sissons et al. also observed this bimodal age distribution pattern, with a first peak during the second decade of life and second peak in older adults.⁷ We found that the tumour has higher prevalence in males than females. Tunn et al, found higher prevalence of osteosarcoma in female patients.⁸

Most of the patients presented to us at Enneking stage 2b and AJCC stage 2a and 2b.

CONCLUSION

Our study shows that osteosarcoma has a bimodal prevalence in our setting, with mostly male patients. The most common site was found around the knee joint. Patients presented to us at advance stage of the tumour.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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