# A Five year Audit of Different Paediatric Bony Lesions presented to a Tertiary Care Hospital.

Waheed Altaf[1], Sarmad Khalil[2], Muhammad Arslan[3], Naeem Ahmed[4], Atiq uz Zaman[5], Amer Aziz[6], Ashfaq Ahmed[7]

[1-3]Resident, Department of Orthopaedic and spine Ghurki Trust Teaching Hospital, Lahore.
[4-6]Professor, Department of Orthopedic and Spine, Ghurki Trust Teaching Hospital, Lahore.
[7]Assistant Professor, Department of Orthopaedic and spine, Ghurki Trust Teaching Hospital, Lahore.

**Authorship and contribution Declaration:**
Each author of this article fulfilled ALL 4 Criteria of Authorship:
1. Conception and design or acquisition of data, or analysis & interpretation of data.
2. Drafting the manuscript or revising it critically for important intellectual content.
3. Final approval of the version for publication.
4. All authors agree to be responsible for all aspects of their research work.

**Corresponding author:**
**Ashfaq Ahmed**
E-mail: ashfaqjadoon20@gmail.com

## ABSTRACT

**Objective:** To determine the pattern of paediatric bony tumours or tumour like lesions presenting to the Department of Orthopaedics & Spine Surgery Ghurki Trust Teaching Hospital Lahore in the past five years.

**Methods:**This retrospective Cohort study was conducted in Department of Orthopaedics & Spine Surgery Ghurki Trust Teaching Hospital Lahore.The records of all children with bony lesions fulfilling the inclusion criteria who presented to our hospital in time period extended from 1st April 2015 to 1st April 2021 were reviewed.The type of lesion, gender, site, histological type and treatment of each bony lesion was documented.

**Results:** The total number of children with tumour or tumour like bony lesions were 212.The mean age was 11.55±3.12 years. Male children were 145(68.39%) and female were 67(31.60%). The most common tumor site was distal femur noted in 65 (30.66%) children. Osteosarcoma was the predominant bone tumour diagnosed in 118(55.6%) children followed by with Ewing sarcoma in 32(15.1%), chondrosarcoma in 20(9.43%) and osteoid osteoma in 12(5.6%) chilfren. Excisional biopsy was the most common(38.20%,n=81) surgical intervention followed by incisional biopsy in 52(24.52%) children.

**Conclusion:** Tumour or tumour like bony lesions were more frequently detected in male children than in female children.Distal femur was the most commonly involved bone.Osteosarcoma was the most commonly diagnosed primary malignant bone tumour while Osteochondroma and Aneurysmal Bone Cysts were the most frequently detected benign bony lesions.

**Keywords:** Benign, Ewing sarcoma,Malignant,Osteosarcoma,Paediatric.

**This article may be cited as:** Altaf W, Khalil S,Arslan M,Ahmed N, Zaman AU, Aziz A,et al. A Five year Audit Of Different Paediatric Bony Lesions presented to a Tertiary Care Hospital.J Pak Orthop Assoc 2022;34(1): 23-26.

## INTRODUCTION

Bony lesions are frequently detected in children either symptomatic or incidental findings with the sixth most common neoplasm being the primary bone tumour.[1-2] Although majority of the pediatric bone tumours are benign,[3] and CT or MRI may be the beneficial tool of investigations,the initial screening investigation of choice is still the simple radiographic film. The Orthopaedic surgeon must be familiar with the characteristic radiographic features of the benign paediatic tumours because most of them are asymptomatic and discovered incidently and therefore un necessary expensive and invasive additional investigations can be avoided. Osteochondroma, aneurysmal Bone Cyst, Unic-Camera Bone Cyst, Osteoid osteoma, Nonossifying Fibroma and Histiocytic Cell Langerhans are among the most common pediatric benign bone tumours.[2,4] More than 90% of the primary paediatric malignant bone tumors are Osteosarcoma and Ewing sarcoma.[5] Malignant paediatric bone tumours have the worse prognostic rates and lowere survival rates than the adult tumours.[6] Early diagnosis and prompt treatment of malignant childhood tumours are therefore critical for improving the quality of living and enhancing the survival rates.[7,8] With the advent of many new modalities of diagnosis and treatment the musculoskeletal oncology have been revolutionized globally and patient care has been improved.[9,10]

The objective of our study was to determine the pattern of paediatric bony tumours or tumour like lesions presenting to the Department of Orthopaedics & Spine Surgery,Ghurki Trust Teaching Hospital Lahore in the past five years.Our study would help to establish basline data for further epidemiological studies on paediatric osseous maliginancies in our country and establishment of paediatric tumour registry which would in turn improves the quality of treatment of paediatric bone tumours.

## METHODS

We conducted this retrospective Cohort study in Department of Orthopaedics & Spine Surgery Ghurki Trust Teaching Hospital Lahore. The records of children with bony tumour or tumour like lesions who presented to our hospital in time period extended from 1st April 2015 to 1st April 2021 were reviewed.All children (<16 years) of either gender who had complete record and follow up were included in this study. Children with infective or inflammatory osseous pathology, pathological fracture, secondary malignancy, metastasis and those who were initially treated surgically or received chemotherapy or radiotheraphy in other hospitals were excluded.The study was approved by the The Ethical Committee of our Hospital. From medical record the type of lesion, gender, site, histological type and treatment of each bony lesion was noted.

All the data were entered and analyzed using SPSS version 23. Mean and Standard deviation was calculated for continuous variables while frequency and percentages were calculated for qulaittaive variables. Data was presented in table where necessary.

## RESULTS

We reviewed the medical record of 212 children with tumour or tumour like bony lesions. The mean age was 11.55±3.12 years. Male children were 145(68.39%) and female were 67(31.60%). The most common tumour site was distal femur noted in 65 (30.66%) children. Osteosarcoma was the predominant bone tumour diagnosed in 118(55.6%) children followed by Ewing sarcoma in 32(15.1%), chondrosarcoma in 20(9.43%) and osteoid osteoma in 12(5.6%) children (Table I). Right side was involved in 145(68.39) and left in 67(31.6%). The Osteosarcoma included 75(63.55%) male children and 43(36.44%) female children. Majority (55.08%, n=65) of osteosarcoma was in distal femur followed by proximal humerus (17.79%, n=21) and proximal tibia (8.47%, n=10). Radiologically majority (79.66%, n=94) of the tumours were mixed variety, Osteoblastic in 14(11.86%) and Osteolytic in 10(8.47%) children. Histopathology reports revealed conventional blastic variety of osteosarcoma in 91(77.11%) children while telangiectatic osteosarcoma was noted in 27(22.88%) children. Excisional biopsy was the most common (38.20%, n=81) surgical intervention followed by incisional biopsy in 52(24.52%) children, curretage in 24(11.3%) and other procedures in 55(25.94%) children.

**Table I:** Gender and agewise frequency of different bony lesions in our study.

| Bony Lesion | Male (n,%) | Female (n,%) | Mean Age±SD(years) |
|---|---|---|---|
| Osteosarcoma | 75 (63.55%) | 43(36.44) | 10.24±3.4 |
| Ewing Sarcoma | 22(68.75) | 10(31.25) | 12.37±2.8 |
| Chondrosarcoma | 18(90) | 2(10) | 13.37±4.5 |
| Osteoid Osteoma | 12(100) | -- | 11.5±3.2 |
| Osteochondroma | 3(42.85) | 4(57.14) | 11.7±3.5 |
| Aneurysmal Bone Cyst (ABC) | 3(42.85) | 4(57.14) | 10.28±3.7 |
| Others | 12(75) | 4(25) | 11.2±2.5 |

## DISCUSSION

In our study the mean age was 11.55±3.12 years.Osteosarcoma was the predominant bone tumour diagnosed in 118(55.6%) children followed by Ewing sarcoma in 32(15.1%), chondrosarcoma in 20(9.43%) and osteoid osteoma in 12(5.6%) children. Our data is consistent with previous literature. Petca[11] documented that the mean age was 13.32 years in his series with 54.1% children had Osteosarcoma, 30.82% had Ewing's sarcoma and 8.9 % children had chondrosarcoma. Gawande [12] studied 216 cases of paediatric bone tumours and noted that the most common site of tumor was the distal femur with Osteosarcoma as the most common histopathological diagnosis. Bamanikar[13] had demonstrated that both Osteosarcoma and Osteoid osteoma were the most prevalent Bone forming tumors in his series. Kaatsch and Strothottee[14]

reported higher frequency of Osteosarcoma and Ewing sarcoma in their series of paediatric bone tumours. Greige and colleagues[15] have documented that approximately 700 children in the USA are dignosed annually to be suffering from malignant bone tumours and constituting about 6% of all childhood tumours with Osteosarcoma accounting for 56% and Ewing Sarcoma 34%. Stiller [16] reviewed the data of 5572 children and adolescent with malignant bone tumours and noted that Osteosarcoma was present in 51% registration and Ewing Sarcoma in 41% children.

Contrary to the above studies Ozkan *et al*[17] reviewed the record of 57 children with tumour or tumour like lesions and found that primary benign bone tumours were more common than malignant.They found that Osteochondroma was present in 31(54.3%) and Osteoid osteoma in 9(15,7%) children.Malignant bone tumours(Chondrosarcoma and Ewing Sarcoma) were found in only 2 children each. Similarly Rutkowski [18] analyzed the data of 289 children with mean age 11.4±4.1 years.Boys were 178(61.6%) and girls 111(38.4%).Biopsy of tumour and tumour like lesions confirmed Osteochondroma in 81(47.4%) children, fibrous dysplasia in 11(6.4%), bone cyst in 11(6.4%) and non ossifying fibroma in 14(8.2%) children. Mohammad[19] reviewed the biopsy record of 40 children with tumour or tumour like lesions and noted that malignant bone tumour was present in 19(47.5%) and benign tumour in 12(30%) children. The most common malignant tumour was Burkitt's lymphoma present in 37.5% children while Osteochondroma was the most common benign tumour noted in 22.5% children. Van den Berg and Kroon[20] analyzed the data of 1474 children and noted that Osteochondroma and aneurysmal bone cyst was the most common tumours with boys more commonly affected than female children.

The limitations of our study were the retrospective design of our study,lack of long term outcome of surgical procedures and nonavaialability of concordance between the initial radiological diagnosis and final histopathologically confirmed diagnosis of tumour or tumour like bony lesions. Further well designed studies are therefore recommended to confirm our results.

## CONCLUSION

Tumour or tumour like bony lesions were more frequently detected in male children than in female children.Distal femur was the most commonly involved bone.Osteosarcoma was the most commonly diagnosed primary malignant bone tumour while Osteochondroma and Aneurysmal Bone Cysts were the most frequently detected benign bony lesions.

**Conflict of Interest:** None

**Grants/Funding:** None

## REFERENCES

1. Gereige R, Kumar M. Bone lesions: benign and malignant. Pediatr Rev. 2010;31(9):355-362.
2. Vartevan A, May C, Barnes CE. Pediatric bone imaging: Differentiating benign lesions from malignant. Applied Radiology. 2018;47(7):8-15.
3. Wyers MR. Evaluation of pediatric bone lesions. Pediatr Radiol. 2010;40(4):468-473.
4. Khanna G, Bennett DL. Pediatric bone lesions: beyond the plain radiographic evaluation. Semin Roentgenol. 2012;47(1):90-99.
5. Sun Y, Liu X, Pan S, Deng C, Li X, Guo Q. Analysis of imaging characteristics of primary malignant bone tumors in children. Oncol Lett. 2017;14(5):5801-5810.
6. Collins M, Wilhelm M, Conyers R, Herschtal A, Whelan J, Bielack S,*et al*.Benefits and adverse events in younger versus older patients receiving neoadjuvant chemotherapy for osteosarcoma: findings from a meta-analysis. J Clin Oncol. 2013;31(18):2303-2312.
7. Kaste SC: Imaging pediatric bone sarcomas. Radiol Clin North Am. 2011;49(4):749–65,
8. Costelloe CM, Madewell JE. Radiography in the initial diagnosis of primary bone tumors. AJR Am J Roentgenol. 2013;200(1):3-7.
9. Rana KA, Meyer J, Ibrahim S, Ralls M, Kent PM. The role of imaging of malignant bone tumors in children and young adults. Curr Probl Cancer. 2013 ;37(4):181-91.
10. Eftekhari F. Imaging assessment of osteosarcoma in childhood and adolescence: diagnosis, staging, and evaluating response to chemotherapy. Cancer Treat Res. 2009;152:33-62.
11. Petca RC, Gavriliu S, Burnei G. Retrospective clinicopathological study of malignant bone tumors in children and adolescents in Romania - single center experience. J Med Life. 2016;9(2):205-210.
12. Gawande VB., Aniruddha C.A Retrospective Analysis of Bone Tumours at Tertiary Care Hospital of Rural India: A 5 Years Analysis. Journal of Orthopedic Education. 2018;5(2).74-80.

13. Bamanikar SA, Pagaro PM, Kaur P, Chandanwale SS, Bamanikar A, Buch AC. Histopathological Study of Primary Bone Tumours and Tumour-Like Lesions in a Medical Teaching Hospital. JKIMSU. 2015;4(2):46-55.
14. Kaatsch P, Strothotte J, Becker C, Bielack S, Dirksen U, Blettner M. Pediatric bone tumors in Germany from 1987 to 2011: incidence rates, time trends and survival. Acta Oncol.2016 ;55(9-10):1145-1151.
15. Stiller CA, Bielack SS, Jundt G, Steliarova-Foucher E. Bone tumours in European children and adolescents, 1978-1997. Report from the Automated Childhood Cancer Information System project. Eur J Cancer.2006 Sep;42(13):2124-2135.
16. Gereige R, Kumar M. Bone lesions: benign and malignant. Peds in Review. 2010;31(9):355-363.
17. Ozkan EA, Goret CC, Ozdemir ZT, Yanık S, Dogan M, Gonultaş A, *et al*, Pattern of primary tumors and tumor-like lesions of bone in children: retrospective survey of biopsy results. Int J Clin Exp Pathol. 2015 ;8(9):11543-11548.
18. Rutkowski M, Niewinska K. The Epidemiology of Benign Proliferative Processes of the Skeletal System in Children. Int J Environ Res Public Health. 2021;18(17):9338. doi: 10.3390/ijerph18179338.
19. Mohammed A, Sani MA, Hezekiah IA, Enoch AA. Primary bone tumours and tumour-like lesions in children in Zaria, Nigeria. Afr J Paediatr Surg. 2010;7(1):16-18.
20. van den Berg H, Kroon HM, Slaar A, Hogendoorn P.Incidence of biopsy-proven bone tumors in children: a report based on the Dutch pathology registration "PALGA".J Pediatr Orthop.2008; 28(1):29-35.