ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

CLINICOPATHOLOGICAL STUDY OF BONE LESIONS IN TERTIARY CARE CENTER – A REVIEW OF 80 CASES

Dr.Deval Patel, Dr.Parth Patel,Dr.Takshay Gandhi, Dr.Neel Patel, Dr.Jagdish Patwa.
Department Of Pathology, S.B.K.S. Medical College And Research Institute, Vadodara, Gujarat.
Department Of Orthopaedics, S.B.K.S. Medical College And Research Institute, Vadodara, Gujarat.

Manuscript Info

Manuscript History:

Received: 15 May 2015
Final Accepted: 22 June 2015
Published Online: July 2015

Key words:

Bone Tumours; Non-neoplastic lesions: Neoplastic lesions: Clinico-Pathological Correlation

Corresponding Author

Dr.Deval Patel

Abstract

Introduction: Bone tumours are comparatively uncommon among wide array of lesions and pose a diagnostic problem as they constitute a small portion of diagnostic experience among pathologist.

Aims & Objective: To study the histopathological features of bone lesions and their correlation with age of presentation, site and type of lesion.

Material and Methods: The present study was carried out at a tertiary care center from June 2013 to May 2015. A total of 80 bone lesions were analyzed. A detail clinical and radiological history was taken. Bone biopsy was performed by either percutaneous method with needle/drill or Open surgical biopsy. If attached soft tissue was also received, bony tissues were put for decalcification (10% nitric acid) and soft tissue was immediately fixed into 10 % formalin and processed by paraffin embedding. Sections were stained by haematoxylin and eosin stain.

Results: Incidence of non-neoplatic and benign neoplastic lesions was (68.75%) while that of malignant lesion was only 20 %.Younger patients (58.24%) and males (60%) were more commonly affected. Amongst non-neoplastic lesions, tuberculous lesions (17.5%) were commonest while exostosis (osteochondroma) (15%) was common benign and osteosarcoma and chondrosarcoma were common malignant neoplastic lesions. Overall most common bone involved was femur. Osteolytic lesions were more common. Metaphysis was the commonest site. In tuberculous lesions, vertebrae were commonly involved.

Conclusion: Though bone tumours are less common lesions and pose a diagnostic problem, if viewed in perspective of clinico-radiology and histopathology, a correct diagnosis can be reached.

Copy Right, IJAR, 2015,. All rights reserved

INTRODUCTION

Definative clinical diagnosis of bone lesion is often difficult. So it is essential to identify the lesion correctly before deciding the line of treatment, be it simple currettement, excision surgery, amputation or irradiation. For the correct diagnosis of bone lesions, charting out treatment plan and estimating prognosis, interpretation of biopsy material proves to be indispensable.[1]

Many inflammatory, neoplastic, degenerative and metabolic diseases occur in bones. They may affect children, adults or the elderly persons. They sometimes occur and develop quickly, often revealing themselves through pain, or the appearance of a palpable mass or by restricting the movement of the part involved.

Clinical symptoms alone are of relatively little significance in most bone lesions as most patients complain of pain or swelling or both. Such as patient with Ewing's sarcoma may present with fever and increase erythrocyte sedimentation rate mimicking the diagnosis of osteomyelitis.[1] The roentgenogram can be considered as gross manifestation of bone lesion. It helps in defining exact location of lesion, but there are also limitations such as some primitive bone lesions like bone Ewing's sarcoma may appear as normal while some benign lesions like aneurysmal bone cyst or osteoblastoma may appear aggressive on roentgenogram. Biochemical investigations alone are also of not major value in the diagnosis of most of the bone lesions except in some cases as in myeloma.

Materials and Methods

The present study was carried out at a tertiary care center from June 2013 to May 2015. A total of 80 bone lesions were analyzed. All the cases were studied prospectively in this study. A detail history of each patient regarding age, sex, chief complaints, clinical examination and imaging finding were taken. The surgically resected specimens fixed in 10% formalin were received. At our set up, bone biopsy were performed by two methods: Percutaneous method with needle/drill and open surgical biopsy with a success rate of 5- 84% and 96 % respectively.[2]

Bony along with soft tissue biopsy or in some cases amputated limb was received, and thorough gross examination of each lesion was done. Soft tissue of each biopsy was immediately fixed into 10 % formalin and processed by paraffin embedding. Bone from each biopsy was kept for decalcification in 10% nitric acid. After that, fixation in 10% formalin, processing and haematoxylin and eosin staining was performed. In some cases, like suspected small round cell tumour (Ewing's sarcoma), special stains like periodic acid schiff staining was also performed on tissue sections for confirmation.

Results

A histopathological study of various bone lesions was carried out at a tertiary care center from June 2013 to May 2015. During these 24 months, total 80 cases were studied prospectively. Non neoplastic lesions comprised 33 cases (41.25%), 22 cases (27.5%) had benign lesions and malignant lesions accounted for 20% (16 cases) while 9 cases (11.25%) were inconclusive. Bone lesions were more common in younger age group 11-30 years (58.24%). Males (48 out of 80cases, 60%) were affected more commonly than females (32 out of 80 cases, 40%) with male to female ratio as 1.5:1.

Amongst non-neoplastic lesions, tuberculous lesions (14 cases, 17.5%) were commonest followed by chronic Osteomyelitis (9 cases, 11.25%) while exostosis (12 cases, 15%) was more common in the category of benign neoplastic lesions. Giant cell tumour (5 cases, 6.25%) was also reasonably common. Osteosarcoma and chondrosarcoma (4 cases of each, 5%) were common malignant neoplastic bone lesions. Osteosarcoma and chondrosarcoma were common in females while others were common in males in our study. Patients up to 30 years of age were more prone to tuberculous lesions while chronic osteomyelitis was common in 11-20 years of age. Exostosis affected patients in their 3rd decade, giant cell tumour affected patients in their 4th decade, osteosarcoma was common in patients of 11-20 years of age and chondrosarcoma was common in 5th decade. Metaphysis of long bones was the commonest site of involvement. Non neoplastic bone lesions affected metaphysis of long bones commonly.
Chronic osteomyelitis commonly affected femur while vertebrae was affected more commonly in tuberculous lesion. Metaphysis of femur was the preferred site for many malignant lesions except Giant cell tumour which affected epiphysis in most cases. Osteolytic lesions were more common than osteosclerotic lesions. (Table 1, 2, 3, 4)

Table-1: Incidence of Bone Lesions according to Age and Sex

Age	Male	Female	Total (%)
0-10	5	4	9 (11.25)
11--20	15	12	27 (33.75)
21-30	12	7	19 (23.75)
31-40	3	3	6 (7.5)
41-50	3	2	5(6.25)
51-60	4	2	6 (7.5)
>60	6	2	8 (10)
Total	48	32	80

Table-2: Incidence of Bone Lesions according to Histological Subtypes

Histological subtypes	Age in years							Gender		
	0-10	11 -- 20	21-30	31-40	41-50	51-60	>60	male	female	total
Non-neoplastic bone lesions										
Chronic Osteomyelitis	1	4	1	2	1	0	0	8	1	9
Tuberculous lesion	3	4	4	0	1	2	0	6	8	14
Brodies abscess	0	1	0	0	0	0	0	1	0	1
Nonspecific inflammation	0	0	1	0	2	0	2	3	2	5
Foreign body reaction	0	0	0	0	1	0	0	1	0	1
Avascular necrosis of hip- Sickled RBCs	0	1	1	0	0	0	1	2	1	3
Neoplastic bone lesions										
Chondroma	0	0	0	0	0	0	1	1	0	1
Chondroblastoma	0	1	0	0	0	0	0	1	0	1
Chondrosarcoma	0	1	0	0	0	2	1	1	3	4
Osteochondroma (Exostosis)	2	4	6	0	0	0	0	9	3	12
Osteoma	0	1	0	0	0	0	0	1	0	1
Osteosarcoma	0	3	1	0	0	0	0	0	4	4
Ewing's sarcoma/ PNET	1	0	0	0	0	0	0	1	0	1
Giant cell tumour	0	1	1	2	0	0	1	2	3	5
Chondromyxoid fibroma	0	0	0	1	0	0	0	0	1	1

Chordoma	0	0	0	0	0	0	1	1	0	1
Tumor like conditions										
Metaphyseal fibrous defect	0	1	0	0	0	0	0	0	1	1
Fibrous dyplasia	0	1	0	0	0	0	0	0	1	1
Myositis ossificans	0	1	0	0	0	0	0	1	0	1
Giant cell reparative granuloma	0	1	0	0	0	0	0	0	1	1
Aneurysmal bone cyst	0	0	1	0	0	0	0	1	0	1
Subchondral cyst	0	0	0	0	0	1	0	1	0	1
Secondary (Mets) in bone	0	0	0	0	0	0	1	1	0	1
Inconclusive	2	2	3	1	0	1	0	6	3	9
Total	9	27	19	6	5	6	8	48	32	80

Table-3: Distribution of Bone Lesions according to Location and Site

Lesion	Bone Involved				Epiphysis	Metaphysis	Diaphysis	Other	Total
	Femur	Tibia	Humerus	Small Bones					
Osteosarcoma	3	1	0	0	0	4	0	0	4
Osteochondroma (Exostosis)	8	1	1	2@	0	10	0	2	12
Giant cell tumour (GCT)	4	0	1	0	4	1	0	0	5
Chronic osteomyelitis	5	2	1	1#	3	5	1	0	9
Tuberculous lesion	2	0	2	10$	1	6	0	7	14
Avascular necrosis of hipSickled RBCs	3*	0	0	0	0	0	0	3	3

* Head; @ rib, scapula; # thumb; $ Spine (6), finger (2), radius (1), hip (1)

Table-4: Distribution according to Radiological Picture

Lesion	Osteolytic Lesion	Osteosclerotic Lesion
Osteosarcoma	2*	2**
Osteochondroma(Exostosis)	3	0
Giant Cell Tumour(GCT)	5	0
Chronic Osteomyelitis	0	9
Tuberculous Lesion	14	0

* Telangiectatic Periosteal; ** Periosteal Chondroblastic

Discussion

Bone lesions themselves constitute a small fraction of all the lesions prevailing in a population. It is absolutely essential to be equipped with information regarding the clinical details viz. age, gender, site and radiological findings before diagnosis of any bone lesion. Certain entities can be confused clinically like osteomyelities and ewing's sarcoma, traumatic fracture or pathological fracture, osteoblastoma and osteosarcoma and tuberculosis or malignancy. Therefore, histological diagnosis is must in all bone lesions to differentiate above mentioned entities, to confirm the diagnosis of radiologist and clinician and to predict the prognosis of bone lesion on the basis of different cytomorphological criteria. The present study was undertaken with a view to find out incidence of bone tumours and tumour like conditions in this part of Gujarat and to find out common type of lesions and tumours.

In present study, bone lesions were seen in younger age group (<30 years). Males were more commonly affected. Femur (metaphysis) was most common bone involved. Metaphysis was the commonest site of localization of most of bone lesion. Epiphysis was commonly involved in Giant cell tumour. Osteolytic lesions were commoner than osteosclerotic ones.

Primary bone tumours were more common than secondaries.[3,5,8-14] Non neoplastic and benign lesions were more common than malignant lesions. Tuberculosis was most common non neoplastic condition affecting 14 patients (17.5%). Tuberculous spine was the most common presentation. Other non-neoplastic condition was chronic osteomyelitis in which femur was affected.

Benign cases were more common as compared to malignant cases similar to other studies.[3-5,8-15] Osteochondroma was most common neoplastic benign condition.[8-15] Femur was commonly affected. Males are affected more than females. Others benign tumours were chondroma, osteochondroma, osteoma and chondromyxoid fibroma. In malignant lesion, osteosarcoma and chondrosarcoma were common. Osteosarcoma was the most common primary malignant tumour and affected femur in 75% cases. Others also reported similar findings.[4,6,8-15] Other malignant bone lesions included Ewing sarcoma, Chordoma and giant cell tumour. Giant cell tumours were more common in 3rd decade, females were commonly affected and femur was the most common site similar to other study.**[7]** Tumour like conditions included subchondral cyst, aneurysmal bone cyst, giant cell reparative granuloma, myositis ossificans, fibrous dysplasia and metaphyseal fibrous defect.

Conclusion

In our study, benign lesions (non-neoplastic and neoplastic) were more common (68.75%) than malignant lesions (20%). Bone lesions were more common in younger age group 11-30 years. Males were more commonly affected than females. Tuberculous lesion affecting bone was the most common non neoplastic lesion, followed by chronic osteomyelitis. In case of neoplastic lesions, exostosis was commonest benign tumour. Amongst malignant lesions, osteosarcoma and chondrosarcoma were common. Femur was the most frequently preferred location, but tuberculous lesions were seen in vertebrae. All the lesions were quite consistent in their occurrence with relation to age, sex and site of distribution and show little deviation from the usual behaviour in this respect.

References

1.Sternberg SS, Millis SE, Carter D. Sternberg diagnostic surgical pathology. 4th edi. Philadelphia: Lippincott Williams & Wilkins. 2004. p. 265-320.
2.Forest M, Tomeno B, Vanel D. Orthopedic Surgical Pathology: Diagnosis of Tumors and Pseudotumoral Lesions of Bone and Joints. 1st edi. Edinburgh: Churchill Livingstone. 1997.
3.Rao VS, Pai MR, Rao RC, Adhikary MM. Incidence of primary bone tumours and tumour like lesions in and around Dakshina Kannada district of Karnataka. J Indian Med Assoc 1996;94(3):103-4, 121.
4.He XH. Analysis of 1355 cases of tumors and tumor-likelesions in the bone. [Article in Chinese]. Zhonghua Zhong Liu Za Zhi 1990;12(1):66-8.
5.Valdespino-Gómez VM, Cintra-McGlone EA, Figueroa- Beltrán MA. Bone tumors. Their prevalence. Gac Med Mex1990;126(4):325-34.
6.Dahlin DC, Coventry MB. Osteogenic sarcoma. A study of six hundred cases. J Bone Joint Surg Am 1967;49:101-10.
7.Dahlin DC, Cupps RE, Johnson EW Jr. Giant-cell tumor: a study of 195 cases. Cancer 1970;25(5):1061-70.
8.Bahebeck J, Atangana R, Eyenga V, Pisoh A, Sando Z,Hoffmeyer P. Hoffmeyer Bone tumours in Cameroon: incidence, demography and histopathology. Int Orthop2003;27(5):315-7.
9.Barbosa CS, Araujo AB, Miranda D. Incidence of primary benign and malignant neoplasms and bone pseudotumoral lesions. An epidemiologic analysis of 585 cases diagnosed at the Faculdade de Medicina of the Universidade Federal de Minas Gerais. [Article in Portuguese]. AMB Rev Assoc Med Bras 1991;37(4):187- 92.
10.Solooki S, Vosoughi AR, Masoomi V. Epidemiology of musculoskeletal tumors in Shiraz, south of Iran. Indian J Med Paediatr Oncol 2011;32(4):187–91.
11.Yang DZ, Wu X. Primary bone and joint tumor--statisticalanalysis of 571 cases. [Article in Chinese]. Zhonghua Zhong Liu Za Zhi 1986;8(1):51-4.
12.Pongkripetch M, Sirikulchayanonta Y. Analysis of bone tumors inRamathibodi Hospital, Thailand during 1977-1986: study of 652 cases. J Med Assoc Thai1989;72(11):621-8.
13.Baena-Ocampol del C, Ramirez-Perez E, Linares-GonzalezLM, Delgado-Chavez R. Epidemiology of bone tumors in Mexico City: retrospective clinicopathologic study of 566 patients at a referral institution. Ann Diagn Pathol2009;13(1):16-21.
14.Mohammad A, Isa HA. Pattern of primary tumours andtumour-like lesions of bone in Zaria, northern Nigeria: a review of 127 cases. West Afr J Med 2007;26(1):37-41.
15.Obalum DC, Giwa SO, Banjo AE, Akinsulire AT. Primary bone tumours in a tertiary hospital in Nigeria: 25 year review. Niger J Clin Pract. 2009;12(2):169-72.