BONE TUMOURS AND TUMOUR-LIKE LESIONS: 10 YEARS RETROSPECTIVE ANALYSIS OF BIOPSY RESULTS

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ABSTRACT

Objective: To show the frequency of tumours and tumour-like lesions in various age groups, male to female ratio and the bones commonly involved.

Material and Methods: Microscopic slides, tissue paraffin blocks, clinical record and available x-rays of 271 patients whose specimens were reported between 1992 to 2001 were retrieved from the record of Pathology Department, Lady Reading Hospital (LRH) Peshawar. Of the total, 21 cases had inadequate material. The slides were reviewed by two histopathologists.

Results: Results showed osteosarcoma (OSA) and Ewing's sarcoma to be the commonest malignant tumours in childhood and adolescence with the mean age of 15.3 years. Lymphoma, fibrosarcoma, malignant fibrous histiocytoma (MFH) and giant cell tumour were the commonest malignancies in middle adulthood with the mean age of 32.2 years. In the late adulthood and old age (mean age of 51.2 years), metastatic tumours, plasma cell myeloma and chondrosarcoma were the commonest malignant bone tumours. Osteosarcoma was the commonest malignant and osteochondroma was the commonest benign bone tumour. The bones most commonly involved were femur, tibia and humerus. In male to female ratio, male preponderance was noted in most of the malignant tumours except giant cell tumour and Ewing's sarcoma.

Conclusion: The study consisted of a small number of cases and was biopsy based, therefore need careful interpretation.

Key words: Bone tumours, Tumour like lesion, Lymphoma, Fibrosarcoma, Histiocytoma.

INTRODUCTION

Most malignant bone tumours arise de novo, but some arise in pre existing conditions[1]. The important causes include genetic alterations[2], Paget's disease[3], radiation exposure[4], chemotherapy[5] and pre existing benign bone lesions[1] .Foreign bodies[6], trauma[7] and viruses[8] are less important causes of bone tumours. Bone tumours not only vary in histologic and radiologic features but also show great variation in behavior ranging from innocuous to extremely fatal. Clinically bone tumours may present in various ways. The benign tumours may remain asymptomatic and be detected incidentally. Others may produce pain or swelling and still others may present as pathological fracture. Age of the patient and their radiographic analysis play an important role in the diagnosis of bone tumours and tumour-like lesions. Ultimately histopathological examination is required to confirm the diagnosis and to stage the tumour before starting the treatment. The fine needle aspiration (FNA), large core needle biopsy, incisional biopsy and at times excisional biopsy are some of the means to obtain specimens from the lesion. Frozen section is very helpful in determining the adequacy of the specimen besides providing a preliminary but a fairly reliable diagnosis. Special histochemicals and immunohistochemical stains are extremely helpful in the differentiation of various tumours. Electron microscopic (EM) examination and polarized light in some cases provides clue to the diagnosis[9, 10].

MATERIAL AND METHODS

The clinical record, available radiographs, tissue paraffin blocks and microscopic slides of all patients whose bone biopsies were reported in Pathology Department, LRH Peshawar during the years 1992-2001 were included in this study. Microscopic slides were stained by haematoxyline and eosin routinely; however, special stains such as Gomori reticulin and periodic acid Schiff (PAS) stains were also employed in some cases. The radiographic studies were of plain radiographs. The slides were reviewed by two histopathologists. The hospital radiologist was consulted on the radiographs.

RESULTS

The results of bone tumours and tumour-like lesions are summarized in table 1, 2 and 3. A total of 271 cases were reviewed, of which 21 cases had inadequate material. Of the remaining 250 cases, 141 were males and 109 were females. One hundred and fifty two (60.8%) cases had malignant while 98(39.2%) had benign tumours. Of the malignant tumours, osteosarcoma was 47(18.8%); giant cell tumour 29(11.6%); metastatic 31(12.4%); chondrosarcoma 12(4.8%); Ewing's sarcoma 11(4.4%); malignant lymphoma 9(3.6%); plasma cell myeloma 5(2%); MFH 3(1.2%) and fibrosarcoma 3(1.2%). Adamantinoma and chordoma was one case each. Out of 31 metastatic tumours 30(96.7%) were carcinomas and 1(3.3%) was neuroblastoma. Of the 98 benign tumours and tumour-like lesions, osteochondromas were 35(14%); chondromas 10(4%); osteoid osteoma 8(3.2%); chondromyxoid fibroma 5(2%); haemangiomas 2(0.8%); desmoplastic fibroma 3(1.2%); fibromyxoma 2(0.8%). Aneurysmal bone cysts were 15(6%); solitary bone cysts 8(3.2%); metaphyseal fibrous defect 1(0.4%) and fibrous dysplasia 9(3.6%). In male to female ratio, male preponderance was seen in osteoid osteoma, chondrosarcoma, malignant lymphoma and fibrous dysplasia. Slight male predominance was seen in osteosarcoma, osteochondroma and metastatic tumours. The predominance of female was seen in giant cell tumour (GCT) and Ewing's

sarcoma. The bones commonly involved in order of frequency were femur 77(30.8%), tibia 45(18%) and humerus 19 (7.6%).

Osteosarcoma and Ewing's sarcoma were the commonest malignant tumours in the first two decades of life; GCT, malignant lymphoma, fibrosarcoma and MFH were the commonest tumours in the third and fourth decades of life; while in the age group of 41 and above, metastatic tumours followed by chondrosarcoma were the commonest.

The total number of bone forming tumours was 55(22%); cartilage forming tumours were 62(24.8%); tumours of unknown origin were 41(16.4%) and haematopoietic tumours were 14(5.6%). Tumours of histiocytic and fibrogenic origin were 3(1.2%) each; followed by tumours of notochordal and vascular origin as 1(0.4%) and 2(0.8%) respectively.

DISCUSSION

The study of bone tumours and tumour like lesions was laboratory based and included a total of 271 cases. Of the total, 21(8.4%) were of inadequate material. Of the remaining 250 cases, 152(60.8%) were malignant and 98(39.2%) were benign. Of 152 malignant tumours, 121(80.7%) were primary and 31(20.4%) were metastatic tumours. The percentage figures of malignant versus benign are in conformity while, the percent-

SHOWING THE TOTAL NUMBER OF MALIGNANT BONE TUMOURS IN DESCENDING ORDER, AVERAGE AGE, MALE TO FEMALE RATIO AND THE COMMONLY INVOLVED BONES IN ORDER OF FREQUENCY.

Tumour	No. of cases	Mean age (yr)	Sex M:F	Bones commonly affected in order of frequency
Osteosarcoma	47	16.8	1.2:1	Femur 20, Tibia 10, Humerus 06, Pelvis 02, Fibula 02, Vertebra column 01, Calcaneum 01, Unknown 05.
Metastatic tumours	31	32.4	1.3:1	Femur 10, Pelvis 05, Vertebral column 03, Humerus 01, Clavicle 01, Scapula 01, Metacarpal 01, Unknown 08, Tibia 01.
Giant cell tumour	29	29.7	1:1.4	Femur 09, Tibia 07, Fibula 04, Ulna 02, Radius 01, Unknown 06.
Chondrosarcoma	12	50.4	3:1	Femur 03, Tibia 01, Humerus 02, Scapula 01, Pelvis 01, Calcaneum 01, Sternum 01, Unknown 02.
Ewing's sarcoma	11	13.7	1:1.8	Pelvis 03, Tibia 03, Femur 02, Talus 01, Humerus 01, Scapula 01.
Malignant lymphoma	09	28	8:1	Femur 04, Vertebral column 02, Tibia 02, Unknown 01.
Plasma cell myeloma	05	63	1:1.5	Femur 02, Vertebral column 02, Unknown 01.
Fibrosarcoma	03	38.6	2:1	Tibia 01, Femur 01, Sacroiliac joint 01.
Malignant fibrous histiocytoma	03	32.5	2:1	Tibia 02, Femur 01.
Chordoma	01	60	M-01	Sacrococcyx.
Adamantinoma	01	07	M-01	Tibia.

TABLE – 1

SHOWING THE TOTAL NUMBER OF BENIGN BONE TUMOURS IN DESCENDING ORDER, AVERAGE AGE, MALE TO FEMALE RATIO AND THE COMMONLY INVOLVED BONES IN ORDER OF FREQUENCY.

Tumour	No. of Cases	Mean Age (Yrs)	M:F Ratio	Bones commonly involved in order of frequency
Osteochondroma	35	18.2	1.2:1	Femur 10, Tibia 06, Humerus 06, Calcaneum 03, Fibula 01, Radius 01, Rib 01, Scapula 01, Phalynx 01, Unknown 05.
Chondroma	10	28.1	1:1	Phalynx 02, Metacarpal 02, Pelvis 01, Tibia 01, Calcaneum 01, Sacrococcyx 01, Unknown 02.
Osteoid osteoma	08	21	3:1	Femur 05, Tibia 03
Chondromyxoid fibroma	05	25.4	1:1.5	Metatarsal 02, Tibia 01, Phalynx 01, Unknown 01.
Desmoplastic fibroma	03	10	2:1	Tibia 01, Fourth toe 01, Mandible 01.
Fibromyxoma	02	37.5	M-02	Tibia 01, Unknown 01.
Haemangioma	02	18	1:1	Femur 01, Tibia 01.

TABLE – 2

SHOWING THE TOTAL NUMBER OF TUMOUR-LIKE LESIONS IN DESCENDING ORDER, AVERAGE AGE, MALE TO FEMALE RATIO AND THE COMMONLY INVOLVED BONES IN ORDER OF FREQUENCY.

Tumour	No. of Cases	Mean Age (Yrs)	M:F Ratio	Bones commonly involved in order of frequency
Aneurysmal bone cyst	15	24.5	1.1:1	Femur 07, Tibia 02, Humerus 01, Radius 01, Clavical 01, Unknown 03.
Fibrous dysplasia	09	20	8:1	Tibia 01, Femur 01, Fibula 01, Humerus 01 Radius 01, Skull 01, Jaw 01, Unknown 02.
Solitary bone cyst	08	19.1	1:1.7	Femur 01, Tibia 01, Humerus 01, Unknown 05.
Metaphyseal fibrous defect	01	14	F-01	Tibia.

TABLE – 3

age figures of primary versus secondary are the reverse of what is published in large series abroad[11]. The likely reason may be that the study was based on a small number of cases. Metastatic tumours are common in old age group. The deceptively low number of metastases may also be due to non access to hospital because of poverty, inadequate medical facilities and the lack of care in old age. The percentage figures of various groups of tumours published in the literature[12, 13] show haematopoietic tumours as 39.8%, chondrogenic as 21.3%, osteogenic as 19.2% and tumours of unknown origin as 10.3%. The tumours of histiocytic origin, fibrogenic origin, notochordal and vascular origin are as 0.7%, 3.7%, 3.1% and 1.7% respectively. The percentage figure of our study for haematopoietic tumours is 5.6%. The reason for the gross disparity is that the entity of haematopoietic tumour is largely dealt by haematology section and their

figures are not included in this study. There is minor disagreement in the percentage figures of MFH and fibrosarcoma also. The reason is that MFH remained a contentious entity in our department. The male to female ratio showed male preponderance in all tumours except in case of giant cell tumour and Ewing's sarcoma. Similar findings are reported in the studies done abroad[14]. The bones commonly involved in order of frequency as found in this study are, femur 77(30.8%), tibia 45(18%) and humerus 19(7.6%). The percentage figures for bone involvement could not be retrieved in the literature; however, they are reported to be the commonest bones involved in the same order of frequency[15,16]. Many studies have reported Osteosarcoma to be the commonest primary malignant tumour and osteochondroma as the commonest primary benign tumour[11,17,18]. The same is found in this study. The average age, male to female ratio and the bones commonly involved is also in conformity with the findings in the literature. Malignant primary tumours of bone occurred in 152(60.8%) of 250 patients whose records were examined in our series. It is assumed that this percentage is high and that the incidence of many of the benign tumours is artificially low because only tumours with histologic evidence for the diagnosis were included in this study. In many patients the lesions under went neither biopsy nor resection, in most cases because the clinical and radiographic findings were believed to be characteristic of a benign bone tumour[19]. The reverse was true in cases of malignancies where biopsy report was considered essential for diagnosis and treatment[10, 14, 17, 18]. Some of the tumour entities are strikingly missing in this study. The worth noting entities include osteoma, benign and malignant osteoblastoma, chondroblastoma and Langerhans' cell granulomatosis. Similarly variants of Osteosarcoma and chondrosarcoma are negligible as compared to the studies done abroad[20, 21]. The small number of biopsy based cases in this study, lack of biopsy in benign lesions, the difficulty of microscopic diagnosis in the malignant entities are some of the likely causes. Because of the lack of paget's disease in this region, the second peak of Osteosarcoma in late adulthood and old age is not encountered in this study[1].

CONCLUSION

Age of the patient and radiological features played a key role in the diagnosis. Diagnostically sex was not a significant parameter. The need for guided bone biopsy, frozen sections and immunohistochemical tumour markers was felt. As the study was retrospective, based entirely on available records, small in numbers, so it needs to be interpreted cautiously. A true picture, similar or otherwise will emerge only after long term, broad based studies are conducted.

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