CLINICOPATHOLOGICAL CORRELATION IN OSTEOCLASTOMAS: THE UNIVERSITY HOSPITAL EXPERIENCE

S Sambandan
R Pathmanathan

SYNOPSIS

38 of 41 cases of proven osteoclastomas seen in the University Hospital between 1967 and 1985 were followed up from 1 to 13 years, with a mean follow-up of 4 years. Tumours were found to be commoner in males (M:F = 3.4: 2, P < 0.05), with lower femoral lesions the commonest mode of presentation. Tumours were graded according to the criteria of Jaffe and Leichtenstein (1). Various histological parameters were evaluated: number of mitoses/10 high power fields, presence of abnormal mitoses, stromal cellular atypia, tumour necrosis, relative preponderance/ paucity of osteoclasts and presence of foam cells. 9 lesions recurred locally, and metastases occurred in 4 others. The histological differentiation of local recurrences was similar to that of the primary lesion. Recurrence does not imply malignancy but is a manifestation of inadequate primary removal of the tumour. In this limited study we also conclude that tumours with histological evidence of abnormal mitoses and stromal cellular atypia are likely to be clinically aggressive and should be treated with wide local excision.

INTRODUCTION

Most bone tumour studies reviews are from bone tumour registries. Such registries do not exist in Malaysia. Only one previous study of sixteen cases has been reported from this country (2). The purpose of this paper is to review our experience of 41 cases of histologically proven osteoclastomas seen from 1967 to 1985, to document the age, sex and ethnic incidence and to ascertain clinico-pathological correlation.

Department of Orthopaedic Surgery
Faculty of Medicine
University of Malaya
59100 Kuala Lumpur
Malaysia

S Sambandan, FRCS

Department of Pathology
Faculty of Medicine
University of Malaya

R Pathmanathan, MRCPath

MATERIALS AND METHODS

41 cases of histologically proven osteoclastomas were seen in this Hospital between 1967 and 1985. 38 of these were followed up for a period of 1 – 13 years (mean = 4 years). 3 cases died in the first year and 1 case was lost in the first year of follow-up post treatment. Follow-up beyond 36 months was possible in 27 cases. At follow-up visits, the patients were assessed clinically, and where necessary, radiological, biochemical and haematological investigations were performed.

RESULTS

Age, Ethnic and Sex Incidence

The age and sex incidence is shown in Table 1. The age range was from 15 to 50 years with a peak tumour incidence between 20 and 30 years. Of 41 patients, 26 were males (M: F = 3.4: 2, p 0.05). The ethnic incidence is presented in Table 2, and there is no statistical significance in the differences observed.

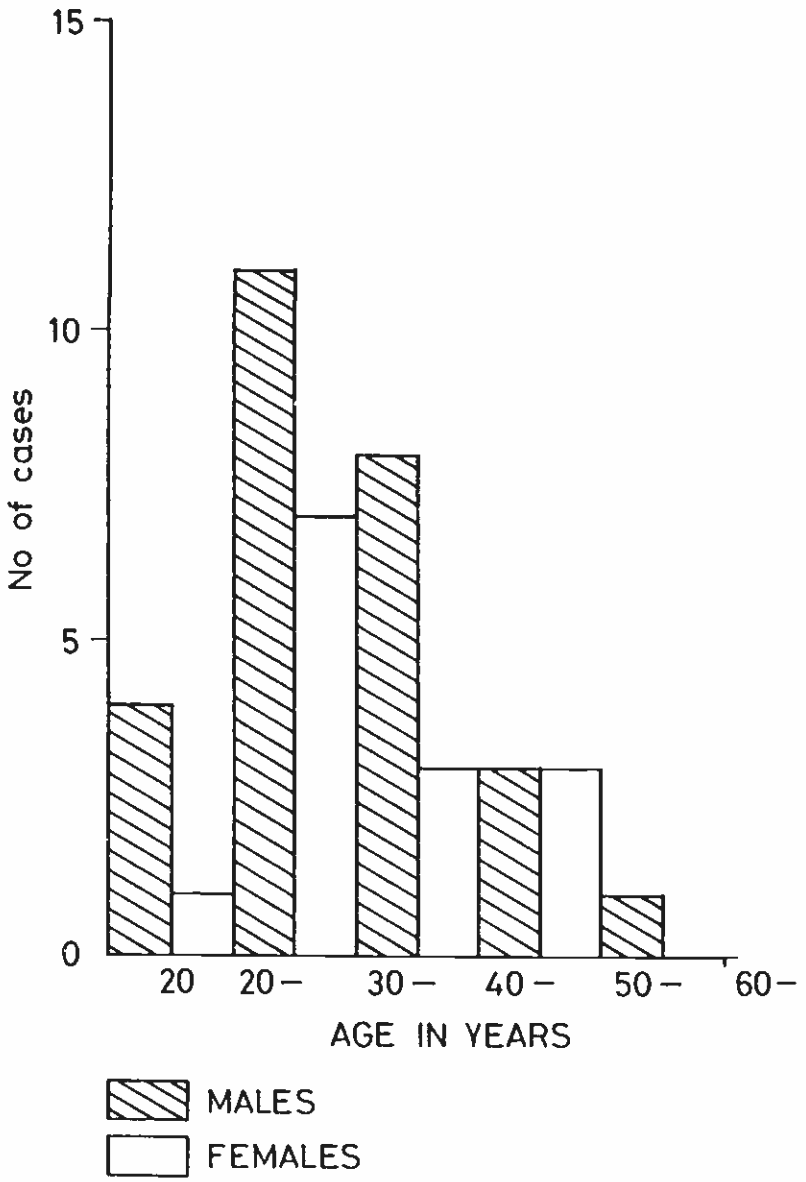
TABLE 2: DISTRIBUTION OF CASES BY SEX AND ETHNIC GROUP

Ethnic Group / Sex	M	F	Total
Chinese	16	11	27
Malay	6	1	7
Indians	4	3	7
Total	26	15	41

Site

Figure 1 illustrates the anatomical distribution of lesions in 41 cases. The most frequent site was the lower femur (14/41), lower radius (7/41) and upper tibia (6/41). A preponderance of right-sided lower femoral lesions was noted.

TABLE 1: DISTRIBUTION OF CASES BY AGE AND SEX



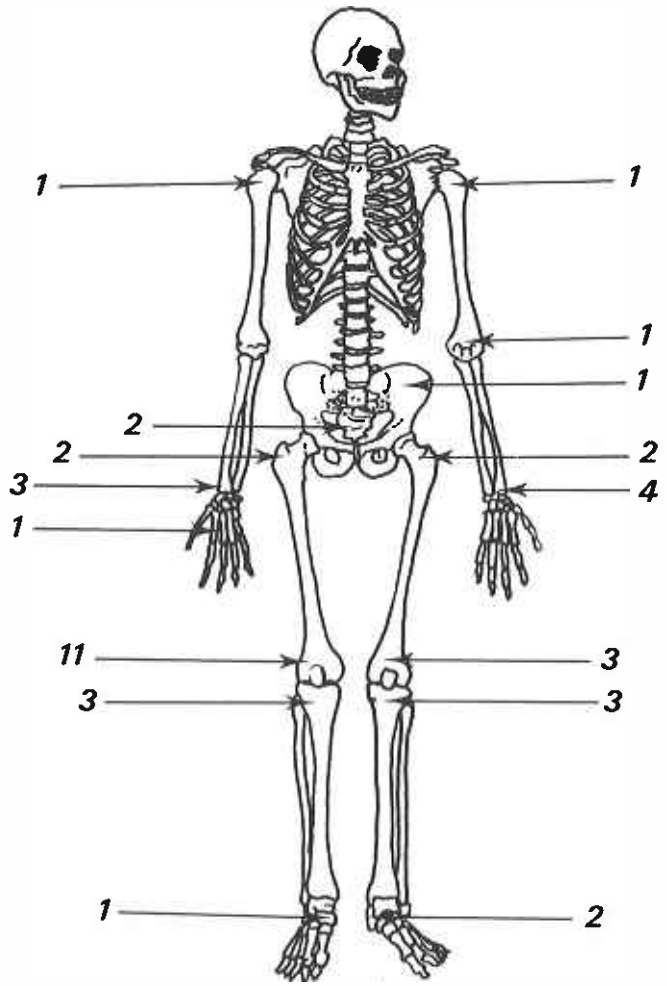


FIGURE 1: Anatomical Distribution of Osteoclastomas

Clinical Features

Pain and swelling were the commonest symptoms. Other symptoms included stiffness of the wrist and knee, wasting and weakness of the thigh (lower femoral lesions), sciatica with numbness (sacral lesions) and pathological fractures. The duration of symptoms ranged from ten days to three years, with a mean period of six months.

Radiology

The commonest radiological feature was that of an expansile lytic lesion. Eight of thirty four long bone lesions were eccenteric. The superior margins of the lower femoral lesions were ill-defined as opposed to that of radial and tibial lesions. A giant-cell tumour involving the sacrum showed radiological signs of crossing the sacro-iliac joint. None of the long bone lesions showed evidence of intraarticular extension. Six patients presented with pathological fractures confirmed radiologically. In twelve patients there was evidence of cortical bone disruption.

Haematological and Biochemical Investigations

Full blood and differential count, ESR, serum alkaline phosphatase, calcium and phosphate levels were assessed routinely. These parameters were within normal limits.

Histopathology

All tissues received was fixed in formalin, processed, embedded in paraffin and stained with H&E. Tumours were graded I to III (Fig. 2-4) according to the criteria of Jaffe and Leichtenstein (1). Grade I tumours were seen in 37 patients. 4 patients had histologically "aggressive" or Grade II tumours, where stromal cellular atypia and abnormal mitotic figures were noted. "Foam" cells were present in Grade I and II tumours frequently. The following histological features were evaluated: the number of mitoses/10 HPF, the presence of stromal cellular atypia, the presence of abnormal mitoses (these were tripolar or rarely multipolar mitotic figures), the presence/absence of "foam" cells and/or necrosis. A subjective analysis of the relative preponderance/paucity of giant cells vs stromal cells was also done.

Treatment

The treatment modalities used for virgin lesions in 37 patients is shown in Table 3. Recurrences are also indicated. The majority of patients were treated by curretage and bone graft. Of 20 patients treated thus, 7 had local recurrences.

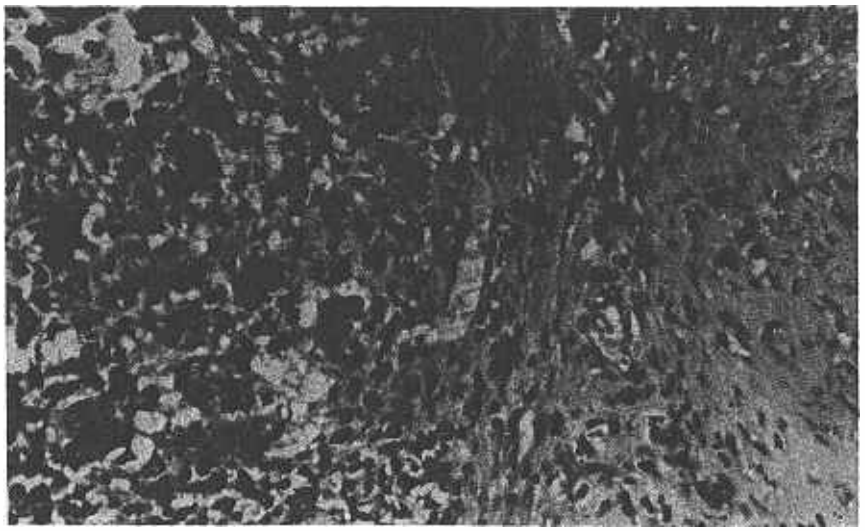


FiG. 2: H&E × 255
Grade I Osteoclastoma with soft tissue extension.

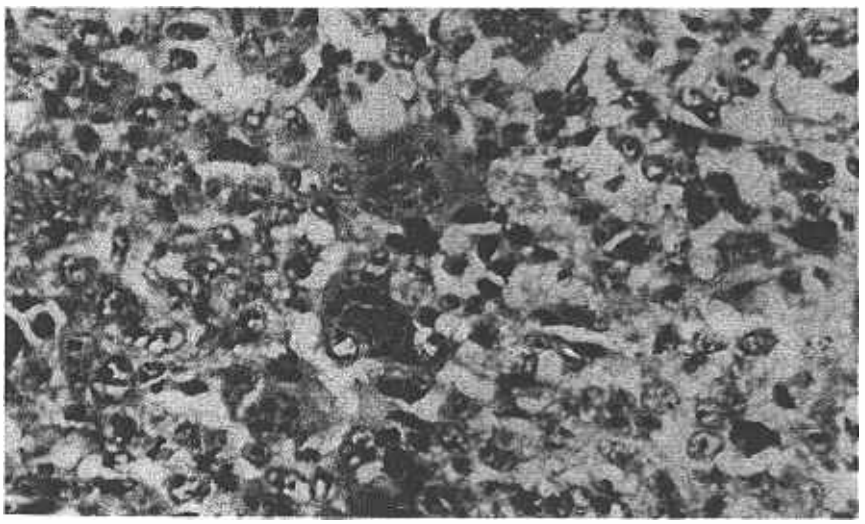


FIG. 3: H&E × 340
Grade II Osteoclastoma. Note plump stromal cells with vesicular nuclei. Mitoses are increased.

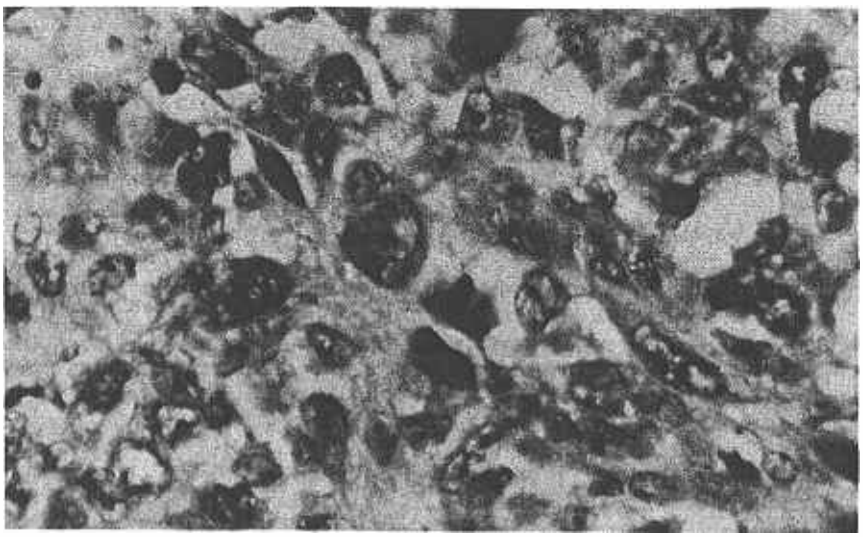


FIG. 4: H&E × 1300
Malignant (Grade III) Osteoclasoma.
Bizarre tumour giant cells are present with malignant stromal cells.

TABLE 3: TREATMENT MODALITIES IN 37 CASES OF OSTEOCLASTOMA

Primary Modality of Treatment	Number	Recurrence
Curettage only	2	2
Curettage + Bone Graft	20	7
Curettage + DXT	2	1 (M)
DXT	1	Lost
P. Exc + Curettage + B. Graft	2	0
Wide Exc + B. Graft + Arthrodesis	5	0
Wide Exc + Live Fib Graft	1	1 (M)
P. Exc + Curettage + B. G + Cement	1	0
Wide Exc + Prosthesis		1 0
Amputation	4	3 (M)

DISCUSSION

This study confirms earlier findings by workers in the East (2-6) who noted the slight male preponderance in contrast to series from the West. The male preponderance in this present series is statistically significant (M: F = 3.4: 2, $p < 0.05$). The increased frequency of the disease in Chinese noted first by Kutty et al (2), was also noted in the present series, although this is not statistically significant. The distribution of the primary lesion approximated that noted in other series; the increased number of right-sided lower femoral lesions remains unexplained.

Although various workers have found radiological features useful in predicting biological behaviour of the tumour, we are doubtful that when considered in isolation, such findings are likely to be useful.

Several workers have attempted to define histological criteria for malignancy/aggressive behaviour in giant- cell tumours of bone (1,7,0). We did not find mitotic index of prognostic value; increased mitotic activity (in excess of 5-10/10 HPF) were noted occasionally in Grade I tumours, that in all other respects looked and behaved in a benign way. Conversely, rarely, low mitotic indices were encountered in tumours that behaved in an aggressive manner. Vascular invasion by tumour cells was sometimes encountered in histological sections of Grade I tumours developed, and we have tended to discount this as a valuable prognostic feature. Similarly, we found no correlation between the presence of "foam" cells, necrosis and inflammatory cells and prognosis.

Tumours we considered to be Grade II histologically *always* recurred locally or presented as metastases. Of the 5 lesions that metastasised, tissue for examination was available from only 3 cases, and of these only one tumour had a sarcomatous histology (Grade III). Of the other two, one was a Grade II and the other a Grade I tumour. This latter case exemplifies the entity of benign metastasising giant-cell tumour of bone. Multiple pulmonary secondaries appeared two years post surgery. The patient absconded shortly after commencing chemotherapy although he maintains follow-up; he is alive 42 months post-diagnosis with static pulmonary lesions.

Three other cases that presented with metastases were clinically malignant, although histological demonstration of sarcomatous elements were possible in only case.

Our experience with 36 cases of osteoclastomas followed up for a period of 24 months and beyond suggests that histological demonstration of stromal cellular atypia and abberant mitotic activity is well correlated with a more aggressive behaviour in that these tumours tend to recur locally or as metastases after limited primary excision. Our finding also support the general view that there are at present no objective histological parameters available between Grade I tumours that will behave aggressively and those that will not. It is possible that multivariate correlate analysis encompassing clinical, biochemical, radiological, gross and microscopic appearance of lesional tissue may prove useful in predicting prognosis.

ACKNOWLEDGEMENTS

The authors would like to thank Professor Sengupta, Dept of Orthopaedic Surgery for much valuable advice. We are grateful to Professor S. Sivanesan, Dept of Pathology, for permission to review the case material.

REFERENCES

1. Jaffe HL, Leichtenstein L, Portis RB: Giant-cell tumour of bone: The pathological appearance, grading, supposed variants and treatment. Arch Path 1940; 30: 993-1031.
2. Kutty K, Sivanantham M, Annamalai, Kaur H: Osteoclastoma — a clinicopathological appraisal. Mal J Surg 1974; 3: 15-22.
3. Tuli SM, Gupta IM, Mishra RK: A clinicopathological appraisal of treatment. complications and recurrences in giant-cell tumour of bone. Ind J Cancer 1984; 21: 14-22.
4. Reddy RM, Rao PS, Rajakumari K: Giant-cell tumour of bone in South India. J Bone Joint Surg 1974; 56A: 617-9.
5. Sung HW, Kuo DP, Shu WP, Chai YB, Liu IC, Li SM: Giant-cell tumour of bone: analysis of 218 cases in Chinese patients. J Bone Joint Surg 1982; 64(A) No 5.
6. Kuo PPF, Cai DT, Zhang HS, Shen CW, Zang BD, Leng LL: Giant cell tumours of bone — a clinical study of 131 cases for the years 1954 through 1969. J Western Pacific Orthopaedic Assoc 1984; 21(2): 47-50.
7 Sanerkin NG: Malignancy, aggressiveness and recurrence in giant-cell tumours of bone. Cancer 1980; 46: 1641-9.
8. Huos AG. Bone tumours. Diagnosis, treatment and prognosis. 10B. Saunders & Co, 1979.
9. Rock MG, Pritchard DJ, Unni KK: Metastases from histologically benign giant-cell tumour of bone. J Bone Joint Surg 1981; 60A: 269-74.