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THE PATHOLOGY OF TUMOUR AND "TUMOUR-LEE" LESIONS OF BONE IN THE UNIVERSITY HOSPITAL, KUALA LUMPUR

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Summary

On the premise of establishing a local set of reference data, a retrospective study of 209 cases of osseous tumour and "tumour-like" lesions biopsied at the Universitv Hospital, Kuala Lumpur from 1980 to 1986 was carried out. The parameters studied were sex, age, ethnic distribution and sites of involvement. 135 (64.6%) primary bone tumours, 53 (25.4%) metastatic lesions and 21 (10.0%) "tumour-like" lesions were seen. Osteosarcoma (16.7%) was the commonest malignant primary tumour biopsied while osteochondroma (12.9%) widely eclipsed the other benign entities. Ethnically, the Chinese predominated among patients with metastatic lesions, osteosarcoma and giant cell tumour. Age and sex distribution resembled other published series. In the more important tumour categories, the femur was the most frequently implicated site.

Key words : Tumour, "tumour-like" lesions, demographic distribution, bone.

INTRODUCTION

There is scanty and incomplete information on the pattern of tumours and "tumour-like" lesions of the bone in the local context. Although theoretically our pattern should closely parallel those in Western countries, with certain exceptions such as metastatic lesions, it is nevertheless important and worthwhile to establish the local pattern as this will be of scientific and clinical interest and will provide a baseline for future reference. This paper analyses 237 biopsies of tumour and "tumour-like" lesions from 209 patients which were received by the Department of Pathology, University Hospital, Kuala Lumpur from 1980 to 1986.

MATERIALS AND METHODS

All histopathological reports with orthopaedic relevance during the specified time period were reviewed. Inflammatory and joint conditions were excluded. Where the histological diagnosis was inconsistent with the clinical one, the histological sections were re-examined and whenever necessary, recuts of the paraffin blocks and special stains were undertaken. In such situations only lesions re-confirmed to be neoplastic were included in this study. Demographic data as at the time of biopsy was obtained from case records. Radiological diagnoses were generally reviewed at the time of biopsy and were not repeated for the purposes of this study. Inadequate biopsies were excluded from this analysis. Data analysis was aided by the usage of the DBASE III programme and a 64K IBM compatible microcomputer.

RESULTS

Of the 209 cases reviewed, 135 (64.6%) had primary bone tumours, 53 (25.4%) had metastatic lesions and in 21 (10.0%) the lesions were categorised as "tumour-like". Table 1 presents a more detailed breakdown of the range of lesions seen while a summary of the parameters studied in the 10 most common lesions is shown in Table 2.

Secondary bone tumours constituted the largest group. As expected, considering the diversity of tumours which metastasise to bone, a wide age distribution was noted (11–77 years) with a mean of 53.0 years. A slight male preponderance (M:F ratio = 1:0.8) was seen. Ethnically, the Chinese appeared to be the predominant race affected (Table 3). The femur and the vertebrae were the commonest sites with biopsied lesions (Table 4) and probably reflect the most frequent sites of metastasis. Although it was not possible to confidently verify the sites of primary tumour in some cases, due either to the lack of clinical information or difficulty in establishing a specific histological diagnosis, malignancies of the lung, breast and thyroid appeared to be the 3 most frequent primaries which metastasised to the bone in this series.

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Osteosarcoma was the most commonly encountered primary entity. Features in this group included a mean age of 16.2 years, a male:female ratio of 1:0.7 and a preponderance of Chinese patients (65.7%). Table 5 summarises the findings. The femur, in particular its lower end, was a major site of involvement, followed by the tibia.

Giant cell *tumours* (osteoclastoma) were the second most common primary tumour in this study. Table 5 summarises the age, sex, ethnic distribution and sites. These tumours manifested at a later mean age (29.3 years) when compared with osteosarcoma. There was no sex predilection. Again the Chinese formed the largest group afflicted and the femur and tibia the leading locations.

Exostoses *(osteochondroma)* ranked as the third commonest primary bone tumour. Notwithstanding the fact that some giant cell tumours can be fairly benign in their behaviour, exostoses were the commonest

TABLE 1
TYPES OF TUMOUR AND 'TUMOUR-LIKE' LESIONS OF BONE
UNIVERSITY HOSPITAL, KUALA LUMPUR 1980 – 1986 (n = 209)

Tumour Category	Diagnosis	No. of cases (%)	Percentage of primary bone tumours in rank order
Primary bone tumours	Osteosarcoma	35 (16.7)	25.9
	Giant cell tumour (Osteoclastoma)	28 (13.4)	20.7
	Exostosis (Osteochondroma)	27 (12.9)	20.0
	Ewing's sarcoma	9 (4.3)	6.7
	Multiple myeloma	7 (3.3)	5.2
	Chondrosarcoma	6 (2.9)	4.4
	Osteoid osteoma	5 (2.4)	3.7
	Lyniphoma	3 (1.4)	2.2
	Chondroma	3 (1.4)	2.2
	Non-ossifying fibroma	3 (1.4)	2.2
	Malignant fibrous histiocy toma	2 (1.0)	1.5
	Others*	7 (3.3)	5.2
Secondary bone tumours		53 (25.4)	
"Tumour-like" lesions	Aneurysmal bone cyst	7 (3.3)	
	Fibrous dysplasia	5 (2.4)	
	Solitary bone cyst	4 (1.9)	
	Histiocytosis X	4 (1.9)	
	Brown tumour of hyperparathyroidism	1 (0.5)	
		209 (100.0)	

* Includes a single case each of fibrosarcoma, mesenchymal chondrosarcoma, ameloblastoma, chondroblastoma, osteoma, non-odontogenic fibroma and acute myeloid leukaemia.

TABLE 2
10 MOST COMMON TUMOUR AND "TUMOUR-LIKE" LESIONS OF THE BONE
UNIVERSITY HOSPITAL, KUALA LUMPUR, 1980 – 1986.

	No. of cases	Sex		M:F	Mean age (Years)	Ethnic distribution No. (%)				3 commonest sites
		M	F			Malay	Chinese	Indian	Others	
Secondary bone tumour	53	30	23	1:0.8	53.0	8 (15.1)	36 (67.9)	8 (15.1)	1 (1.9)	Femur, Vertebra, Pelvis
Osteosarcoma	35	21	14	1:0.7	16.2	7 (20.0)	23 (65.7)	4 (11.4)	1 (2.9)	Femur, Tibia, Humerus
Giant cell tumour (Osteoclastoma)	28	15	13	1:0.9	29.3	2 (7.1)	21 (75.0)	5 (17.9)	0 (0.0)	Femur, Tibia, Vertebra
Exostosis (Osteochondrorna)	27	17	10	1:0.6	17.6	8 (29.6)	11 (40.7)	6 (22.2)	2 (7.4)	Femur, Tibia, Scapula
Ewing's sarcoma	9	7	2	1:0.3	11.6	4 (44.4)	0 (0.0)	4 (44.4)	1 (11.1)	Femur, Tibia, Vertebra
Aneurysmal bone cyst	7	4	3	1:0.8	18.0	2 (28.6)	4 (57.1)	1 (14.3)	0 (0.0)	
Multiple myeloma	7	4	3	1:0.8	57.1	2 (14.3)	2 (28.6)	2 (28.6)	2 (28.6)	
Chondrosarcorna	6	5	1	1:0.2	41.0	2 (33.3)	3 (50.0)	1 (16.7)	0 (0.0)	
Fibrous dysplasia	5	1	4	1:4.0	20.2	3 (60.0)	1 (20.0)	1 (20.0)	0 (0.0)	
Osteoid osteoma	5	4	1	1:0.3	27.6	1 (20.0)	3 (60.0)	1 (20.0)	0 (0.0)	

truly benign tumour of the bone encountered. The salient characteristics considered are tabulated in Table 5.

Altogether 9 cases of *Ewing's sarcoma* were diagnosed in the 6 year period. Analysed data are shown in Table 5. Most of the cases centred around the first decade of life with a mean age of 11.6 years. Perhaps the most striking and interesting finding in this particular group was that, unlike the aforementioned conditions where the Chinese comprised the majority of those affected, there was actually no Chinese involvement here. Admittedly this is too small a sample to derive any meaningful conclusions. Nonetheless this rather unusual ethnic distribution should spur further study.

Only 6 cases of *chondrosarcoma* were seen and features are summarised in Table 5.

TABLE 3
SECONDARY BONE TUMOURS (n = 53)
ETHNIC DISTRIBUTION

Ethnic group	No. of cases (%)
Malay	S (15.1)
Chinese	36 (67.9)
Indian	8 (15.1)
Others	1 (1.9)
Total	53 (100)

TABLE 4
SECONDARY BONE TUMOURS
(n = 53)

Site involved	No.
Femur	16
Vertebra	16
Pelvic bone	6
Rib	5
Humerus	3
Scapula	3
Skull	2
Tibia	2
Clavicle	1
Total	53

A mere 21 cases of *"tumour-like"* lesions were seen and even the most common pathological entity in this subset i.e, *aneurysmal bone cysts* accounted for only 3.3% of the total number of cases biopsied.

DISCUSSION

The University Hospital is the largest hospital serving the Petaling Jaya region and its allocated catchment population includes the inhabitants of 6 municipals namely Petaling Jaya, Sungei Buloh, Bangsar, Pantai, Brickfields and Subang. Despite this seemingly rigid and artificial delineation of patient load, the University Hospital also functions as one of the country's foremost referral centres. Hence the number of cases presenting with sinister implications may exceed that seen in other hospital populations.

There were 154,733 non-obstetric hospital admissions during the 6 year period, of which Chinese formed 44.1%, Malays 27.8%, Indians 26.9% and the minority ethnic groups the remaining 1.2%. Plainly this racial imbalance will bias the distribution of the various tumours observed in this study. Although it would appear to be statistically more appropriate to analyse our findings against a comparison population comprising solely of orthopaedic and surgical admissions, the latter data was particularly difficult to obtain. Taking into consideration the limitations of employing either comparison populations in the analysis, we felt that the racial breakdown of the total non-obstetric admissions is an acceptable reflection of the surgical and orthopaedic patients. Hence no attempt was made to further subdivide the non-obstetric patients according to the various disciplines.

Analysis of the racial prevalence of the groups of lesions using the Chi-square test demonstrated a p value of < 0.5 between observed and expected frequencies of secondary bone tumours, osteosarcoma and osteoclastoma. The Chinese appeared to be the ethnic group most frequently afflicted. Apart from the exostoses, the sample sizes of the other tumour and "tumour-like" lesions were too small for conclusive inference.

The racial distribution of Ewing's sarcoma in Africa and the United States have suggested a genetic resistance among the Negroid population.[1,2] Even though our 9 cases of Ewing's sarcoma did not allow statistical analysis, the complete absence of Chinese patients suggested a similar innate genetic or biological resistance.

Unlike ethnic distribution, whose variations

TABLE 5
DEMOGRAPHIC DATA AND SITES OF 5 COMMON PRIMARY BONE TUMOURS

		Osteosarcoma (n=35)	Osteoclastoma (n=28)	Osteochondroma (n=27)	Ewing's sarcoma (n=9)	Chondrosarcoma (n=6)
Age (Yr)	Range	6 – 30	15 – 47	7 – 30	7 – 15	21 – 59
	Mean	16.2	29.3	17.6	11.6	41
Sex	Male	21	15	17	7	5
	Female	14	13	10	2	1
	M:F ratio	1 : 0.7	1 : 0.9	1 : 0.6	1 : 0.3	1 : 0.2
Ethnic distribution	Malay	7 (20.0%)	2 (7.1%)	8 (29.6%)	4 (44.4%)	2 (33.3%)
	Chinese	23 (65.7%)	21 (75.0%)	11 (40.7%)	0 (–)	3 (50.0%)
	Indian	4 (11.4%)	5 (17.9%)	6 (22.2%)	4 (44.4%)	1 (16.7%)
	Other	1 (2.9%)	0 (–)	2 (7.4%)	1 (11.1%)	0 (–)
Site	Femur	23	10	6	3	2
	Tibia	7	7	5	3	1
	Humerus	2	1	1	–	1
	Vertebra	–	3	1	1	–
	Pelvis	–	2	1	1	2
	Calcaneum	–	2	–	–	–
	Ulnar	–	1	–	–	–
	Radius	–	–	1	–	–
	Scapula	–	–	4	1	–
	Metatarsal	–	–	2	–	–
	Metacarpal	–	–	2	–	–
	Carpal	–	1	–	–	–
	Maxilla	1	–	–	–	–
	Mandible	1	–	–	–	–
	Multiple	–	–	4	–	–
	Unknown	1	1	–	–	–

may be propagated by cultural differences, we do not expect any marked age and sex disparity in the frequency whereby patients seek treatment. We envisage that the pattern of lesions in this study is a useful indicator of the disease prevalence in the community under study. 8 of the commonest lesions showed a male preponderance with the exceptions of giant cell tumour where the sex ratio approached unity and fibrous dysplasia where a female predilection was observed. It is essential to reiterate that apart from the 4 largest groups of lesions, the sample sizes were too small for firm conclusions to be made. However, in general the sex distribution of the main tumours resembled most established series and the inverse female predominance in the fibrous dysplasia group is probably not significant by virtue of the small number of cases encountered.[3,4,5] The age range at clinical presentation of the various common lesions and their sites of involvement also conform to other studies.[3,4,5]

It is recognised that the prevalence of osseous metastases varies with the thoroughness of post-rnortem examination.[3] We emphasise that the prevalence of metastatic tumours in this study is grossly under-represented. Foremost, being a Muslim nation autopsies are generally not readily consented to. Secondly, often enough a suspected bony metastasis is not biopsied if it is clinically thought to be consistent, especially consequent to other less invasive diagnostic procedures.

Benign lesions are also likely to be under-represented. One would expect that some lesions which are obviously benign clinically, such as exostoses, may not have been biopsied.

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