

BONE TUMOURS
IN
MAN AND ANIMALS

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TO
SONIA, HELEN AND RUTH

PREFACE

Comparative oncology is one of the most important aspects of comparative medicine and, with an increasing number of scientists interested in this field, some of the gaps in our knowledge are beginning to be filled. Much fundamental information on neoplasia, particularly in the domestic animals, is still, however, lacking and while unlimited opportunity exists in the veterinary field the profession is small and consequently not able to take full advantage of the situation.

The increased use of isotopes in industry and the fall-out of ^{90}Sr from atomic explosions have stimulated an enormous amount of research into the induction of bone tumours by the radioactive bone-seeking isotopes and research workers from many disciplines are now working on this problem. Bone tumours are consequently not only the concern of clinicians, radiologists and pathologists, both medical and veterinary, but also of biologists, biochemists and radiation physicists.

The publication of clinical and experimental findings is scattered throughout many journals some of which are not always readily available. An attempt has been made in this book to bring together much of this widely dispersed information and a large number of references has been included. Surgeons, pathologists and cancer research workers will find those aspects of the problem with which they are directly concerned and also many others.

Particular emphasis has been placed on the dog, a most valuable animal for the study of cancer not only because of its intermediate size and life-span between mouse and man, but also because it shares man's natural environment.

The text covers a broad field and, as well as including recent advances in the pathogenesis, diagnosis and treatment of bone neoplasia, gives an indication of how further progress could be made.

L.N.O.

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**A Simple Classification of
Primary Tumours of the Skeletal Tissues**

<i>Tissue of origin</i>	<i>Benign</i>	<i>Malignant</i>
Bone	Osteoma Osteoid osteoma Osteoblastoma	Osteosarcoma
Cartilage	Chondroma Osteochondroma Chondroblastoma	Chondrosarcoma
Fibroblastic	Fibroma	Fibrosarcoma
Fat	Lipoma	Liposarcoma
Neurological	Neurofibroma	
Undifferentiated	Osteoclastoma (Giant-cell tumour)	Osteoclastoma (Giant-cell tumour)
Vascular	Haemangioma Haemangiopericytoma	Haemangiosarcoma
Synovial	Synovioma Chondroma	Synovioma
Embryonic Vestigial		Chordoma
Marrow		Myeloma Reticulum-cell sarcoma Ewing's tumour Leukaemia
Heteroplasia		Adamantinoma

CHAPTER 1

PRINCIPLES OF DIAGNOSIS

The diagnosis of bone tumours is best made by a surgeon, radiologist and pathologist working together and jointly considering all the available information. The most common benign tumour in man is osteochondroma and the most frequently seen malignant tumours are myeloma, osteosarcoma, fibrosarcoma, chondrosarcoma and Ewing's tumour. All other bone tumours are rare. In the dog the most common tumour is the osteosarcoma followed by chondrosarcoma and fibrosarcoma. Myeloma in the dog is a very rare tumour and other malignant tumours and benign tumours are seldom seen. In the cat the most common tumour of bone is the osteosarcoma. Bone tumours of any type are infrequently seen in other species, although appreciable numbers of chondroma or chondrosarcoma have been described in sheep.

CLINICAL

Pain

The development of insidious pain is a most common finding in man, transient pain relieved by analgesics giving way to persistent pain in which there is failure to obtain relief. A peculiar pain-relieving effect of aspirin in osteoid osteoma has been described. Localization of the pain frequently occurs early except for tumours of the pelvis or spine in which referred pain may be the first symptom. Pain developing in an asymptomatic lump is believed often to indicate the development of malignancy in a previously benign lesion and, in the case of osteosarcomas, the more malignant the tumour the more rapid is the onset of pain. In primary osteosarcomas of bone in man a direct relationship was found between the duration of pain before the patient sought hospital investigation and histological grading of the tumour. This duration was only a third as long (9 weeks) for the very malignant (Grade III) tumours as for the less malignant (Grade I) tumours (Ross, 1964).