Osteoclastoma of the Femur

Case report by Charles A. Gauci M.D.

Osteoclastoma or giant cell tumour of bone is a relatively infrequent neoplasm. It is generally regarded as being benign, in the sense that as a rule it does not metastasize; however, there is no doubt that a malignant variant which metastasizes does exist. It is claimed that as many as 15-20% of all osteoclastomas are malignant (1). The tumour usually arises at the end of a long bone, invariably the epiphyses with secondary involvement of the methaphyseal area. It is typically an osteolytic lesion that produces some expansion of the bone end.

The most common sites of origin are depicted in Fig. 1. which is based upon a survey of 97 cases carried out by Dahlin (2). The age incidence is usually between 20-55 years, with a predominance of cases in the third decade. Young children and the elderly are seldom affected. Males are affected as frequently as females.

PATHOLOGY

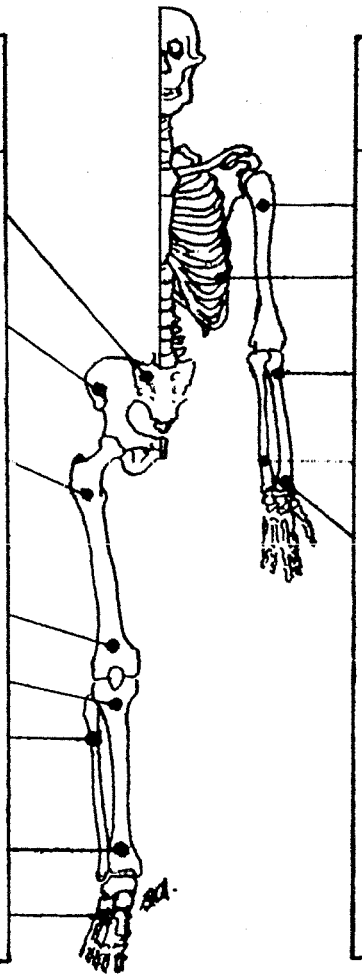
Macroscopic; Osteoclastomas are usually eccentrically located in the epiphyseo-metaphyseal area and have sharp borders delineating them from the normal bone. They are composed of a vascular greyish-red tissue with some zones of necrosis, yellowish streaks and areas of trabeculation extending across cystic cavities; commonly the cortex is thinned and it is not rare to find evidence of tumour tissue extending through cortex into the adjacent soft tissue, as occured in the case reported below. There may be secondary joint involvement.

Microscopic; The tumour tissue consists of two characteristic components viz. (a) spindle shaped cells and (b) multinucleated giant cells (morphologically similar to osteoclasts) the nuclei of which are centrally situated and which have numerous radiating processes that appear to anastomose with those of the spindle cells. It is generally agreed that these giant cells are derived from the spindle cells by fusion of the latter.

The histological appearance of the spindle cells is generally accepted as giving the best indication of malignancy (3). Important features here include: hypercellularity, presence of large hyperchromatic nuclei and abundant mitotic figures; invasion of blood vessels by tumour cells is an ominous sign. However, Jaffe stresses that many a metastasizing tumour has a benign appearance and yet may cause the death of the patient (4). Metastasis occurs usually in the lungs via the bloodstream.

Fig. 1

NUMBER OF CASES	SITE
9	SACRUM
5	ILEUM
1	PROXIMAL END OF FEMUR
32	DISTAL END OF FEMUR
22	PROXIMAL END OF TIBIA
6	PROXIMAL END OF FIBULA
3	DISTAL END OF TIBIA
1	SMALL BONES OF FOOT



SITE	NUMBER OF CASES
PROXIMAL END OF HUMERUS	2
RIBS	1
PROXIMAL END OF RADIUS	1
DISTAL END OF ULNA	4
DISTAL END OF RADIUS	10

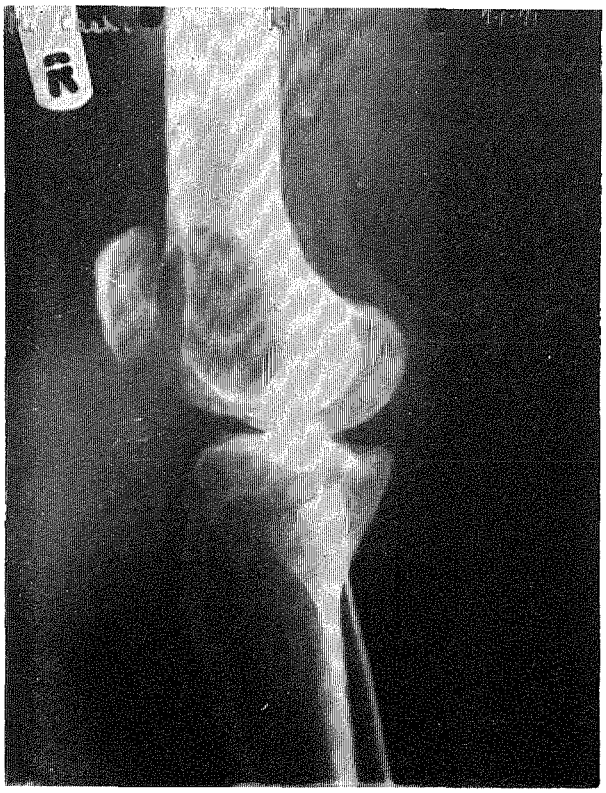


Fig. 2

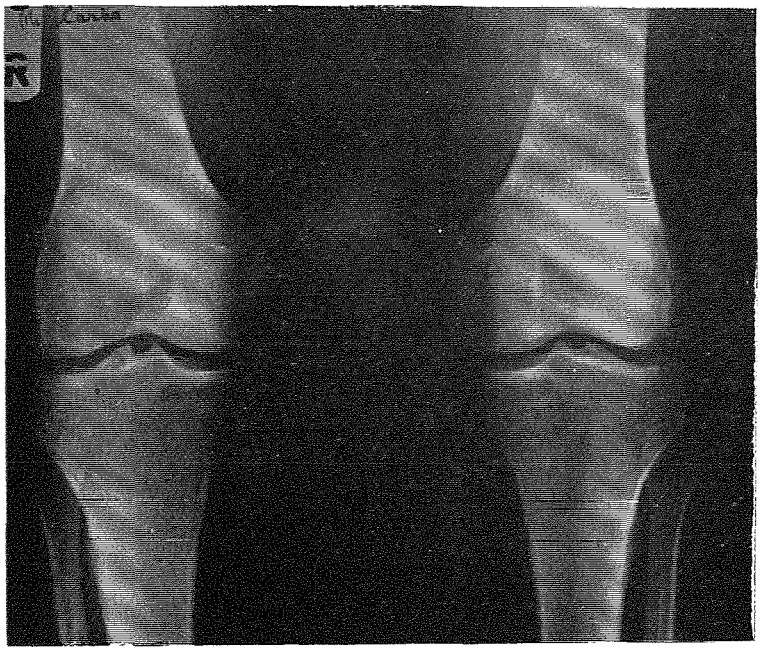


Fig. 3

Fig. 2 and 3: radiographs of right knee showing well defined cystic space in lower end of right Femur.

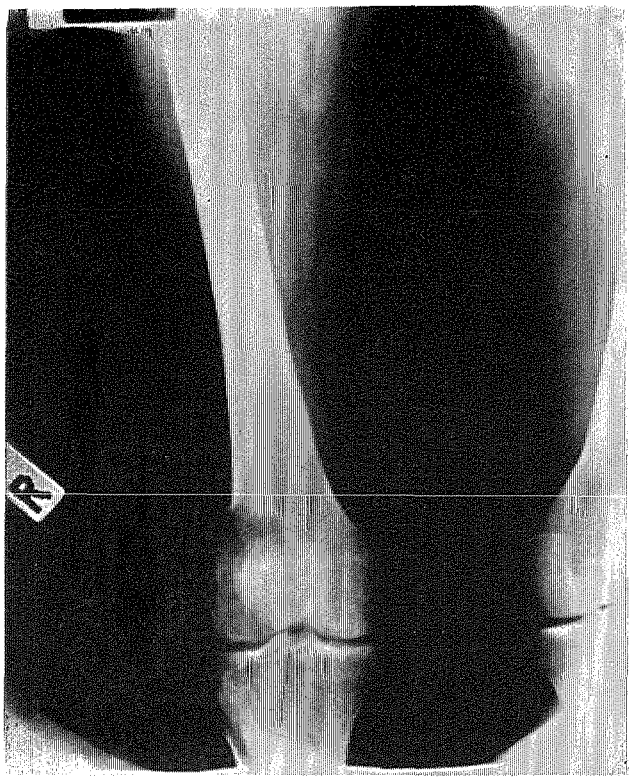


Fig. 4 (2/4/71)

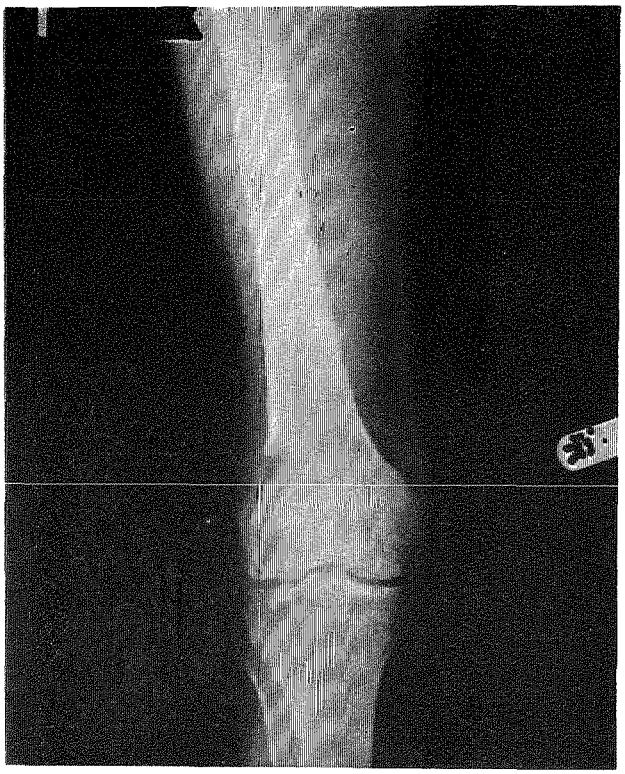


Fig. 5 (13/7/71)

Figs. 4, 5 and 6: Post operative check radiographs showing progressive filling up of space left by Surgeon in lower end of right Femur.

CLINICAL FEATURES

The patient usually presents because of bone pain and loss of function of the adjacent joint. Often we can obtain a history of injury. There may be visible swelling of the involved bone, usually of an asymmetrical nature and "Egg shell crackling" may be demonstrated in some cases. An occasional mode of presentation is pathological fracture.

The radiographic appearances are as would be expected from an osteolytic lesion. The bone end is usually enlarged and occupied by a cyst-like space; close inspection shows local bone destruction with no new bone formation and the bony cortex is thinned out. Typical as these radiographic findings may be, the diagnosis must be ultimately made by biopsy.

CASE REPORT

C.C. a 59 year old male (mechanic by trade) was admitted to M.O.D. on 25/1/71.

On admission patient stated that the previous July he had hit his right knee against a car. The event was followed by some pain and swelling in the joint which subsided within a few days. About three months later he began to experience pain in his right knee. This pain was of a deep boring nature and it started insidiously and progressed steadily until the patient was crippled by it and was unable to attend work. This pain was not relieved by anything but was exacerbated by walking. Accompanying this pain there was also a progressively increasing swelling of the joint and markedly impaired movements. Patient said that he did not lose welght.

He was given poultices by his G.P. all to no avail. Finally he was submitted to a radiological examination which showed the presence of a well defined cyst in the lower end of the right femur (Figs. 2, 3.). He was then referred to the Consultant Orthopaedic Surgeon who advised hospitalisation.

There were no other symptoms; patient was a heavy smoker and drinker. On examination the patient's general condition was satisfactory and the relevant features were marked pain and tenderness especially on the lateral aspect of the right knee joint. Flexion of the right knee joint was full but extension was limited and painful. The right thigh and calf were wasted and weak.

On 28/1/71 under general anaesthesia and utilising a tourniquet, the surgeon opened the lower end of the right femur and found a large cavity full of tumour tissue which he scraped out, including in the procedure healthy tissue all round the cyst wall. The curettings were submitted for histological examination.

Histology showed Osteoclastoma with tumour cells within a venule. The multinucleated tumour cells are compactly arranged; in areas were there is stroma this is densely cellular.

Diagnosis:— osteoclastoma femur, venous emboli. Following pathological confirmation of the diagnosis the patient was submitted to a course of radiotherapy. The most important feature in the pathologist's report was the presence of venous emboli—a presumptive indication of malignancy. With this thought in mind, the patient was submitted to a chest X-ray on 26/2/71; this did not show any abnormality.

The patient responded favourably to radiotherapy; he was fitted with a caliper pending consolidation of the lower end of the femur, and discharged from M.O.D. on 16/4/71.

Follow up was of course mandatory, and the patient was seen frequently at the out-patient department where a close watch was kept for any possible secondaries especially in the lungs. The patient complained of pain and stiffness in the right knee joint initially, but the pain gradually diminished although a certain degree of stiffness persisted.

Check radiographs of the operated area were taken on 2/4/71, 13/7/71 and 5/10/71 and showed that there was progressive calcification and consolidation of the bony trabeculae at the site of operation. (Figs. 4,5,6.).

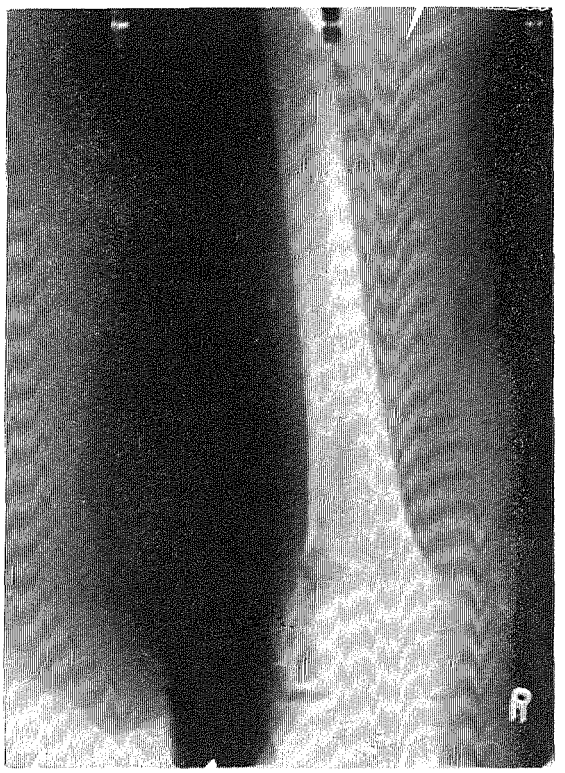


Fig. 6 (5/10/71)

ACKNOWLEDGMENTS

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REFERENCES

1. Ackerman L.V. and Spjut H.J. (1962) Atlas of tumour pathology (Armed forces institute of pathology) sect. II. fasc. 4, Tumours of bone and cartilage; page 203.

2. Dahlin D.C. (1957). Bone tumours-osteoclastoma page 66. Illinors.

3. Payling Wright G. and St. Clair Symmers W. (1960) Systemic pathology vol. 2 page 249. London

4. Jaffe H.L. (1953) Giant cell tumour of bone (osteoclastoma): its pathological delimitation and the inherant clinical implications. Annals R.C.S. Eng. 13; 343.