NON-OSSIFYING FIBROMA OF BONE

(NON-OSTEOGENIC FIBROMA OF BONE)

By E. B. La'Brooy, M.B.,B.S., D.C.P.
and D. R. Gunn, F.R.C.S.E., M.Ch. Orth.

This case is being reported as no previous case can be traced from Singapore or Malaya.

REPORT OF A CASE

The child was a female Punjabi aged seven years.

HISTORY

Whilst playing one day the child's right leg 'gave way': there was pain in the region of the shin and she was unable to walk. Pain persisted, and as walking was still impossible one week later she was brought to hospital.

ON EXAMINATION

The child was healthy and there was no abnormality to be found except in relation to the right leg.

At the junction of the lower and middle third of the right tibia there was an area of increased warmth which was tender and slightly swollen. There was limitation of function of the knee and ankle but no other abnormality.

Investigations carried out were as follows:—

Haemoglobin - - - -	67%
Total White Blood Count	10,200
Neutrophils - - - - -	55%
Lymphocytes - - - -	37%
Eosinophils - - - - -	5%
Monocytes - - - - -	3%
Erythrocyte Sedimentation Rate - - - - - -	29mm/per hour
Serum calcium - - - -	10.8mgms %
Serum inorganic phosphate - - - -	2mgms %
Serum alkaline phosphatase - - - -	40 units (King Armstrong)

X-RAYS

The X-rays revealed a fracture through the cystic area. The cystic area was about 3 cms. by 1.5 cms. in diameter, coinciding with the axis of the shaft, situated posteriorly and medially and occupying about two thirds of the diameter of the tibia. The area was demarcated from the medullary cavity by a clear cut margin of denser bone which showed some scalloping. There was a suggestion of incomplete trabeculation in the upper part of the lesion.

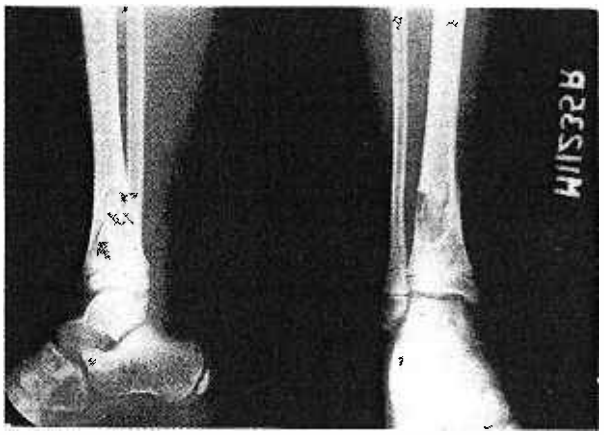

Fig. 1. X-ray shows a pathological fracture through a cystic lesion of the tibia.

TREATMENT

Biopsy was carried out. The cystic area was exposed through the fracture site and wider access achieved by removing part of the cortical bone covering it. The cyst was filled with a greyish gelatinous material: traces of haemorrhage were present and were presumably due to the fracture. There was not a well defined lining but the bony wall had obviously been complete prior to the fracture.

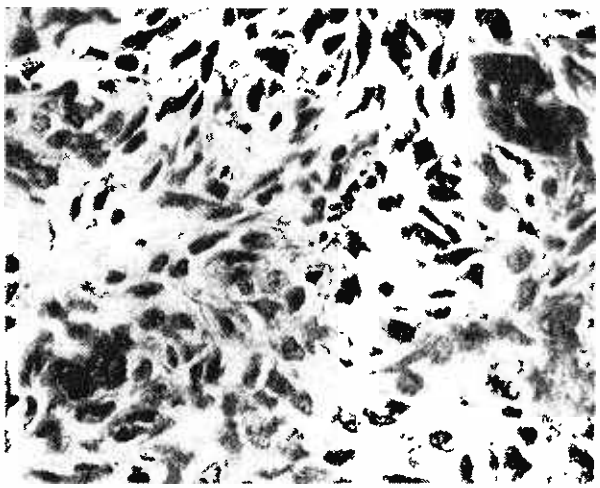

Fig. 2. Photomicrograph showing two small multinucleated giant cells set in a spindle cell fibrous tissue. X 500.

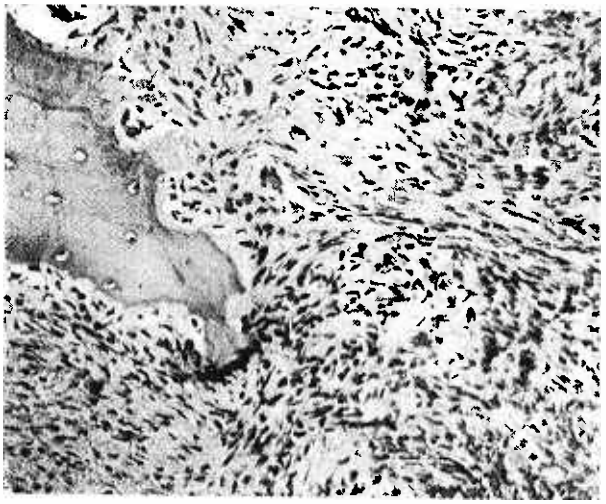

Fig. 3. Photomicrograph showing fibrous nature of the lesion with scanty giant cells. The bone in the section is part of cortical bone eroded by the tumour. X 150.

Microscopic examination of the tissue revealed interlacing sheets and whorls of spindle-shaped connective tissue cells. The cellularity varied and sparsely scattered throughout the lesion were small irregularly shaped multinucleated giant cells. Small aggregates of haemosiderin pigment were also present, but no foam cells were seen. The lesional tissue was seen to extend up to a thin shell of sub-periosteal bone. No bone formation was seen within this connective tissue lesion although newly formed woven bone was present in other areas in relation to necrotic bone and vascular granulation tissue. This was interpreted as a response to the fracture.

DISCUSSION

Jaffe and Lichtenstein described the lesion in 1942 under the title "non-osteogenic fibroma of bone". The purpose of their paper was to separate the condition as an entity as a wide variety of names had previously been given to similar lesions.

The nature and development of non-ossifying fibroma of bone, as the condition is now commonly called, is the subject of conflicting opinions. This arises chiefly in relation to another more common lesion, metaphyseal fibrous defect (Hatcher 1945), or fibrous cortical defect (Jaffe 1958), or subperiosteal cortical defect (Aegerter 1958). These terms are interchangeable and denote the same condition which is usually seen close to the epiphysis of a long bone (the femur, tibia, fibula and humerus being the most commonly affected). It is symptomless and most often discovered as an incidental finding on radiological examination. The lesion is seen as a small translucent area in the metaphyseal cortex, seldom appears before the age of two years, and usually disappears of its own accord within five years after passing towards the diaphysis as a result of bone growth. Histological examination reveals the lesion to consist of a spindle-celled fibrous tissue in which small multinucleate giant cells are found. In older lesions variable amounts of foam cells and haemosiderin are also present (Hatcher 1945, Ponseti and Friedman 1949, Caffey 1955, Campbell and Harbness 1957, Jaffe 1958). There is general agreement that this condition is not neoplastic and probably represents a localised disturbance in the process of ossification. Jaffe (1958) however, maintains that occasionally this lesion "not only persists but undergoes proliferative activity, perhaps attaining a large size. Occasionally it even penetrates into and continues to grow in the medullary cavity. When it does this the lesion ceases to be a mere fibrous cortical defect and becomes what we call a non-ossifying fibroma of bone". He supports his view with the evidence that as opposed to fibrous cortical defect, non-ossifying fibroma of bone tends to occur mainly in older children and adolescents, may provoke clinical complaints such as pain and swelling, and occasionally a pathological fracture occurs at its site. He does agree however that the two lesions represent the same basic condition as evidenced by the fact that their histological appearances are identical. He believes that non-ossifying fibroma seems to represent a tumourous evolutionary form occasionally attained by the fibrous cortical defect. This view represents a change from that expressed by him and Lichtenstein in 1942 when they held the lesion to be a benign connective tissue tumour arising in the marrow. Lichtenstein (1959) however maintains that non-osteogenic fibroma is to be distinguished from fibrous metaphyseal defect, and interpretation of the lesion as a growth defect is not plausible to him. Devlin et al (1955) support this opinion that non-osteogenic fibroma of bone is a tumour.

Dahlin (1957) includes both types of lesions as fibroma of bone and favours the view that they are the result of local defect of growth. He makes no attempt to separate them on clinical or pathological grounds. Maudsley and Stansfield (1956) reported 10 cases under the title of non-osteogenic fibroma of bone. They concluded that the entity of non-osteogenic fibroma of bone is a localised disturbance of bone growth rather than a neoplasm and suggested that the term fibrous metaphyseal defect is more appropriate. In this they supported the

views of Hatcher 1945, Ponseti and Friedman 1949, and Caffey 1955. Campbell and Harkness (1957) and Compere and Coleman (1957) also favour a non-neoplastic origin for the lesion. The latter authors however prefer to retain the name non-ossifying fibroma or non-osteogenic fibroma. To complicate matters still further Aegerter and Kirkpatrick (1958) stated that the two processes are separate entities but they also make clear their view that non-ossifying fibroma of bone is not a neoplasm.

In summary, all authors are agreed that the small early lesions (fibrous defects) are probably developmental in origin. The neoplastic nature of the larger later lesion (non-ossifying fibroma) and its relation to the earlier one are the main points of controversy. The definition of neoplasia has always provided material for much pathological discussion and controversy and this subject is an example in point. Perhaps in time with longer follow up and more frequent microscopic studies of both early and late lesions sufficient evidence will be accummulated to allow unanimous agreement as to the nature and entity of these lesions.

The case recorded here shows features which have been described as typical of non-ossifying fibroma and is therefore being reported as such.

REFERENCES

Aegerter, E. and Kirkpatrick, J.A. (1958) Orthopaedic Diseases. Chapter 12. Philadelphia: W.B.. Saunders.

Caffey, J. (1955) on Fibrous Defects in Cortical Walls of Bones. Advances in Paediatrics.. 7. 13.

Campbell, C.J. and Harkness, J. (1957) Fibrous Metaphyseal Defect of Bone. Surg. Gynec. & Obst. *104*, 329.

Compere, C.L. and Coleman, S.S. (1957). Nonosteogenic Fibroma of Bone. Surg. Gynec. & Obstet. *105*, 588.

Dahlin, D.C. (1957). Bone Tumours Chapter 10 Springfield U.S.A.: Charles C. Thomas.

Devlin, J.A., Bowman, H.E. and Mitchell, C.L. (1955) Non-osteogenic Fibroma of Bone. J. Bone & Joint Surg. *37-A*, 472.

Hatcher, C.H. (1945), The Pathogenesis of Localised Fibrous Lesions in the Metaphyses of Long Bones. Am. Surg. *122*, 1016.

Jaffe, H.L. (1958) Tumours and Tumorous Conditions of the Bones and Joints Chapter 6. London: Henry Kimpton.

Jaffe, H.L. and Lichtenstein, L. (1942). Non-Osteogenic Fibroma of Bone. Am. J. Path. *18*, 205.

Lichtenstein, L. (1959). Bone Tumours 2nd Ed. Chapter 10. St. Louis: C.V. Mosby Company.

Maudsley, R.H. and Stansfield, A.G. (1956) Non-Osteogenic Fibroma of Bone (Fibrous Metaphyseal Defect). J. Bone & Joint Surg. *38-B*, 714.

Ponseti, I.V. and Friedman, B. (1949). Evolution of Metaphyseal Fibrous Defects. J. Bone & Joint Surg. *31A*- 582.