attacks the efferent loop of jejunum was seen to enter the stomach. The patient underwent an immediate operation but no evidence of an intussusception was found. It had evidently undergone spontaneous reduction.

Cases have been reported following partial gastrectomy as well as following gastro-enterostomy, Allen E. Grimes (1949) and W. L. McNamara (1944). They made the observation that there seemed to be no correlation between the incidence of intussusception and the size of the stoma. That would appear to be a widely held opinion.

Shackman has made a plea for early diagnosis. He states that of those cases not operated on within the first 24 hours 50 per cent. die. As has previously been noted, early diagnosis can be extremely difficult. When a patient develops recurrent attacks of colicky epigastric pain with repeated blood-stained vomit, combined with upper abdominal distension and absence of rigidity, the diagnosis is relatively easy, but may have been made too late. The condition should be considered in any patient who complains of abdominal pain and vomiting following a gastro-enterostomy.

Treatment

It is now generally realized that provided the condition is recognized early enough, manual reduction of the intussusception can be carried out at operation without any difficulty, and the results will be satisfactory in all cases.

Before the first operation in this case there was a delay of 36 hours. However, the patient did not develop the severity of vomiting which develops in cases where operation is delayed, mainly due to the fact that she had a Ryle's tube down, which

was aspirated hourly, and her fluid intake was maintained by intravenous infusions of isotonic saline and 5 per cent. dextrose. On both occasions there was no difficulty in manually reducing the intussusception, but in both cases an attempt was made to prevent recurrence. Because of lack of previous knowledge it turned out that I had performed the same manoeuvre which had been carried out at the first operation, namely the hitching up of 4 in. of the efferent loop of the jejunum to the transverse colon. Therefore there seems to be no reason why she should not develop an intussusception for the third time.

Various measures have been suggested for preventing recurrence, namely:

1. Undoing the gastro-enterostomy and reforming it.
2. Entero-enterostomy between the afferent and efferent loops.
3. Partial gastrectomy.

Naturally, as this is only the second case of recurrent gastro-jejunal retrograde intussusception to be reported, it is very difficult to judge the efficacy of these methods.

Shackman reported the occurrence of a case even though entero-enterostomy had been carried out at the time of the gastro-enterostomy.

My thanks are due to Mr. D. McK. Sutcliffe, Land, under whose care the case was admitted, permission to publish this article.

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NON-OSTEOGENIC FIBROMA OF BONE

By RAYMOND FARROW, F.R.C.S.

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The term non-osteogenic fibroma of bone was first used by Jaffe and Lichtenstein in 1942 in order to describe a benign neoplasm of bone which, in their opinion exhibited characteristic clinical, radiological and pathological features. They defined the lesion as a benign tumour derived from mature marrow connective tissue which showed no evidence of ossification. In the latter respect it

becomes distinguishable from other fibromas of bone in which evidence of osseous metaplasia is always present and it is for this reason that the prefix 'non-osteogenic' has been employed.

Clinical Appearances

All cases hitherto recorded have occurred between the ages of 6 and 21 years and with the

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exception of two cases between 8 and 16. The sex incidence is roughly equal, and although the lesion may be entirely without symptoms and only found following X-ray examination for some unassociated condition, it usually calls attention to itself by pain and sometimes swelling in the neighbourhood of a joint. The history is seldom of more than a few weeks' duration and in about half the cases it dates from some trivial injury such as a kick or sprain to the joint in the vicinity of which the lesion is subsequently discovered.

Radiological Appearances

The lesion occurs in the upper or lower third of the shaft of a long bone and is always an inch or so removed from the epiphyseal plate of cartilage. It appears as an eccentrically placed area of rarefaction showing confluent or discrete locules with an encapsulating sheath of bone on its medullary aspect. There is no sign of sub-periosteal new bone formation and the cortex of the bone may appear either to be thinned or expanded but its continuity is always intact. It occurs in order of frequency in the tibia, fibula, femur, ulna and humerus and Lichtenstein (1952) describes the lesion as 'hugging the cortex,' but he emphasizes the fact that in a narrow tubular bone such as the fibula or ulna, it may come to occupy the full

width of the bone, thus increasing the likelihood of pathological fracture and also adding to the difficulty of radiological diagnosis. It is entirely a solitary lesion and the remainder of the skeleton reveals no other abnormality.

It is of interest to note that Katz and Marek (1950) whilst investigating a case of osteolytic osteogenic sarcoma of the medial condyle of the femur in a man of 19 years, discovered a non-osteogenic fibroma situated about 1 in. away from the malignant tumour. Both diagnoses were subsequently verified histologically and no evidence was found to suggest that the malignant condition had arisen from the pre-existing benign non-osteogenic fibroma.

Pathological Appearances

On macroscopic examination the lesion appears as either brown or yellow foci of firm fibrous connective tissue which may be outlined by a thin shell of sclerotic bone. Microscopically the brown foci are composed of a stroma of spindle cells arranged in whorls in which are scattered multinuclear giant cells. Granules of haemosiderin are found in the cytoplasm of both the stromal and the giant cells and it is this feature that is responsible for the brownish colour. The yellow lesions are basically similar in appearance to the brown with

FIGS. 1 and 2.—X-ray photographs showing the lesion described in the text.

the addition of nests of lipoid containing foam cells. Generally speaking the more yellow the focus the more foam cells and the less haemosiderin granules and giant cells does it contain. The significance of this reciprocal incidence of foam cells on the one hand and haemosiderin granules and giant cells on the other is not fully understood. In any one individual lesion both yellow and brown foci together with intermediary stages between them may be found, but in no cases has there been any evidence of osteogenesis.

Case Report

H.A., a male child of 11 years, first came to hospital because he had sprained his knee three weeks previously. On examination his discomfort was considerably less than at the time of injury and there were no abnormal physical signs present in or around the knee, yet an X-ray examination revealed an eccentrically placed loculated area of rarefaction situated in the lower third of the femur about 2 in. away from the epiphyseal line. There

was a thin encapsulating sheath of sclerotic bone on the medullary aspect of the lesion and although there was some slight expansion of the bone, there was no thickening of the cortex nor sub-periosteal new bone formation (Figs. 1 and 2). No other abnormality was found in the remainder of the skeleton and the blood chemistry was in all respects normal.

A few weeks later complete surgical extirpation was performed by Mr. David Levi. The removed specimen consisted of discrete but contiguous foci of firm yellowy-brown connective tissue, some of which were encapsulated with a thin shell of sclerotic bone. Microscopically it revealed a whorled stroma of spindle cells interspersed with small multinuclear giant cells (Fig. 3), and in addition there were numerous nests of lipoid containing foam cells (Fig. 4).

Differential Diagnosis

It is inevitable that there should be some controversy regarding the credentials of this 'new

FIG. 3.—Photomicrograph showing the giant cells lying in the spindle cell stroma.

clinical entity, yet it differs widely from some of the conditions which at first sight it would seem to resemble most closely.

Undoubtedly non-osteogenic fibroma has previously been recorded as a variant type of giant cell tumour, yet the latter always bears a direct relationship to the epiphysis, does not provoke any bony reaction around its periphery and typically occurs in the twenties whereas the former is well removed from the epiphysis, always excites a perifocal osteosclerosis from the adjacent normal bone and is discovered in late childhood and adolescence. Furthermore, the giant cells in non-osteogenic fibroma are small and sparse and the stromal cells show a strong tendency to lipoid infiltration.

Similarly non-osteogenic fibromas have previously been classified as solitary xanthomas or solitary manifestations of chronic idiopathic xanthomatosis (Hand-Schuller-Christian disease), but Jaffe and Lichtenstein regard this interpretation as invalid because half of their own cases failed to show any foam cells at all, although a most careful and prolonged search was made for them.

Solitary bone cysts or 'localized osteitis fibrosa,' though usually appearing in the metaphysis of the bone are invariably situated centrally. In addition they contain fluid suggestive of old haemorrhage

FIG. 4.—Photomicrograph showing a nest of foam cells.

and little or not tissue masses are found adherent to their walls.

Simple fibromas of bone (syn. ossifying fibroma and fibrous osteoma), by their constant content of osseous elements and their almost selective incidence in the bones of the facial skeleton (Mercer, 1950) can hardly enter into the differential diagnosis.

Finally, difficulty may arise in differentiating non-osteogenic fibroma from a low grade fibrosarcoma, yet the absence of nuclear abnormality and mitotic figures should be sufficient safeguard against this. Coley (1949) draws attention to this in recording a case, radiologically indistinguishable from non-osteogenic fibroma in which the histological pattern was sufficiently inconclusive to throw doubt on the diagnosis of malignancy. None the less, it was heavily irradiated, so much so in fact that the degree of radiation osteitis and permanent skin damage necessitated subsequent amputation of the limb. Coley notes that in the past examples of this benign neoplasm have been termed malignant and as such may have been regarded as 'cures.'

Treatment

The treatment of this condition is complete surgical extirpation either by incision and curettage

or by excision of the complete lesion. No recurrences following such surgical procedures have so far been recorded.

Summary

The clinical, pathological and radiological features of non-osteogenic fibroma of bone are described and illustrated by a case report. The differential diagnosis is considered and the treatment is mentioned.

Acknowledgments

I wish to record my grateful thanks to Mr.

David Levi, M.S., F.R.C.S., for his kind permission to publish his case, to Dr. A. D. Morgan for the photomicrographs and to the Westminster Hospital Photographic Department for the prints.

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