REGIONAL OSTEOPOROSIS IN OSTEOID OSTEOMA

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We wish to raise once more the question of this dramatic but uncommon condition; our reason is to draw attention to a problem in differential diagnosis between tuberculosis of a joint and an osteoid osteoma close to a joint or at a distance.

Because patients presenting with tuberculosis of a joint are fewer than in former years it is important to realise that the physical signs of arthritis in a major joint may be produced by an osteoid osteoma in an intracapsular or extracapsular position, and may lead to a mistake in diagnosis. The resemblance to tuberculous arthritis may be both clinical—with pain, stiffness and limitation of movement—and radiographic—with regional osteoporosis as commonly seen about a tuberculous joint.

Regional osteoporosis as a feature of osteoid osteoma has not been emphasised before; we have found it mentioned in the literature on only four occasions (Johnson 1955; Goldthwait, Wang, Castleman and Calkins 1955; Davison 1956; and Flaherty, Pugh and Dockerty 1956). Several writers have presented radiographs without commenting on the regional osteoporosis (MacKenzie 1947; Dockerty, Ghormley and Jackson 1951; and Phalen and Patch 1954).

The case histories of six patients are presented, five of whom were admitted to hospital with suspected tuberculous arthritis.

**CASE REPORTS**

**Case 1**—A boy of fifteen was seen in September 1954 with pain in various situations in the left lower limb. On clinical examination movements of the left hip were full and only the quadriceps muscle was found to be weak. The radiograph was normal. A month later there was limitation of movement at the left hip; and after a further four months he had 10 degrees
of fixed abduction and 30 degrees of fixed flexion, with an inch of wasting of the thigh. Radiographs showed osteoporosis about the hip (Fig. 1).

The boy was admitted to hospital in February 1955 with a provisional diagnosis of tuberculous arthritis. The erythrocyte sedimentation rate was 144 millimetres in the first hour and the Mantoux test was positive at 1/10,000. A tomograph showed a nidus in the left femoral neck (Fig. 2).

At operation a soft vascular tumour half an inch in diameter was found on the anterior surface of the femoral neck; on histological examination this was characteristic of an osteoid osteoma.

A radiograph two years and eight months after operation showed the bone density restored almost to normal.

**Case 2**—A girl of thirteen had had pain in the left knee mainly at night for six months and had limped for three months when seen in June 1953. Between the ages of five and ten years she had been operated upon five times for osteomyelitis of the right femur. Examination showed that all movements at the left hip were limited. The erythrocyte sedimentation rate and the white blood cell count were normal and the Mantoux test was negative, but a radiograph showed osteoporosis of the left hip suggesting tuberculous arthritis. Biopsy of an external iliac gland showed normal tissue. Nearly four weeks later a further radiograph showed an increase in the osteoporosis (Fig. 3) and tomographs revealed an area of sclerosis at the base of the left femoral neck (Fig. 4).

At operation a soft, smooth, dark red nodule a third of an inch in diameter was removed from the sclerotic area of the femoral neck. Histologically this was found to be an osteoid osteoma.
A radiograph sixteen months after operation showed normal density of the bones about the left hip.

**Case 3**—A girl of eleven complained of pain in the left knee for four months. On admission to hospital in August 1949 there was slight limitation of all movements at the left hip. The erythrocyte sedimentation rate was 16 millimetres in the first hour and the Mantoux test was negative. A radiograph showed a defect in the left femoral neck with surrounding sclerosis (Fig. 5). A provisional diagnosis of osteomyelitis was made. A short plaster spica failed to relieve the pain. Ten months later she was readmitted. She still had pain in the left hip but movements were full. The erythrocyte sedimentation rate had risen to 33 millimetres in the first hour and the white cell count to 11,000 per cubic millimetre. A radiograph showed osteoporosis about the left hip and the defect in the femoral neck (Fig. 6).

At operation the cavity in the neck of the femur was explored and the material removed proved the presence of an osteoid osteoma.

Nine months after the operation the density of the left femur had returned almost to normal (Fig. 7).

**Case 4**—A boy of seven had complained of pain in the right thigh off and on for two years and had taken aspirin at night for its relief. When he was examined in June 1954 there was limited rotation of the right hip joint with 20 degrees fixed flexion and wasting of the right gluteal and quadriceps muscles. The erythrocyte sedimentation rate was normal and the Mantoux test negative. A radiograph showed osteoporosis about the right hip with a cortical reaction in the shaft of the femur (Fig. 8).

At operation a block of bone was removed from the femoral shaft. The bone showed a marked cortical reaction, and the presence of an osteoid osteoma was proved histologically.

A radiograph three years and four months after the operation showed a return to normal density of the bones about the right hip.

**Case 5**—A boy of six was seen in September 1955 when he complained of a painful lump on the dorsum of the left foot first noticed ten months before. This had made him walk badly and the left calf had become wasted. A below-knee walking plaster had been worn for five weeks without relief of pain, and a biopsy of the soft tissues had shown no evidence of tuberculosis although this was suspected. An inguinal gland biopsy also showed no evidence of tuberculosis. The Mantoux test was negative.

On examination the left foot was tender and swollen and there was wasting of the left calf and thigh; a cavovarus deformity of the foot was present. A radiograph showed generalised osteoporosis of the left tarsus with an island of density, thought to be an abscess with a sequestrum, in the lateral cuneiform bone (Fig. 9).

At operation in October 1955 material was removed from the lateral cuneiform bone and histological examination revealed an osteoid osteoma.

Six months after operation a radiograph showed that the bone density had returned to normal.
FIG. 5
Case 3—Four months after onset. There is a defect in the left femoral neck with surrounding sclerosis.

FIG. 6
Case 3—Ten months later. The lesion is clearly shown and there is osteoporosis about the left hip.

FIG. 7
Case 3—Nine months after excision of osteoid osteoma. The density of the bones has returned to nearly normal.
Fig. 8
Case 4—Initial radiograph two years after onset showing osteoporosis about the right hip and a cortical reaction in the shaft of the femur.

Fig. 9
Case 5—Initial radiograph showing generalised osteoporosis of the left mid-foot and a dense area in the lateral cuneiform thought to be an abscess containing a sequestrum.
Case 6—A girl of six was seen in September 1959 with pain in the right knee radiating to the hip and shin for five weeks. The pain was worse at nights and her mother said that she walked in an odd way, throwing the right leg out. Examination showed full hip movements and no limp, but the right buttock was wasted and the right thigh was an inch less in circumference than the left. A radiograph showed marked osteoporosis of the right femur (Fig. 10) but the periosteal new bone formation later found on the anterior aspect of the upper shaft was not noticed. The same month a full blood count was within normal limits and the Mantoux test was negative.

Because of the persistence of pain she was admitted to hospital in February 1960 and a radiograph then showed a periosteal reaction on the antero-medial side of the femoral shaft at the level of the lesser trochanter, with a nidus (Fig. 11).

At operation a block of bone was removed containing a bright red nodule of soft tissue which on examination proved to be an osteoid osteoma.

Nine months after operation a radiograph showed a return to normal density of the bones about the right hip joint.

**SUMMARY AND CONCLUSIONS**

1. Regional osteoporosis is a common finding in osteoid osteoma. It may in fact be a constant feature because it was present in all the patients reported in this
paper and was suspected in others who have not been included in this report because of insufficient information.

2. Five of our six cases showed osteoporosis about the hip. Osteoporosis is more likely to be noticed in this region than in other parts of the extremities because both hips are usually radiographed on one film. We have seen several instances in which we suspected generalised osteoporosis of an extremity but Case 5 was the only one in which comparable radiographs had been taken of both feet.

3. When there is osteoporosis in the region of a joint with symptoms referred to that joint an osteoid osteoma may be the cause. The nidus may lie at some distance from the joint surfaces and may not be seen in standard radiographs of the joint (Case 4). Additional radiographs including a wider area than usual may be necessary to show the lesion, and tomography is sometimes required.

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REFERENCES


