OSTEOMALACIA DUE TO STEATORRHOEA

Report of a Case

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FIG. 1.—Anterior and lateral views showing deformities of lower limbs, kyphosis and protuberant abdomen.

FIG. 2.—Close-up of clavicles showing thickening at the junction of the middle and inner thirds.

Steatorrhoea is the commonest cause of osteomalacia in this country. It may be due to definite conditions such as chronic pancreatitis, or to disease of, or operations on the small intestine. In non-tropical sprue or idiopathic steatorrhoea the cause is obscure and there is defective absorption of fat and fat soluble vitamins.

Gastro-intestinal symptoms may be prominent and the stools loose, pale, bulky and offensive. The stools however may be apparently normal, and the diagnosis may then be revealed only by metabolic studies.

Calcium is lost in the bowel from precipitation as soaps by unabsorbed fatty acids, and its absorption is also diminished because of lack of vitamin D. Indeed the patient may present with tetany due to hypocalcaemia.

Severe anaemia and multiple vitamin deficiencies, particularly of the Vitamin B group, may occur; Vitamin K deficiency may result in a haemorrhagic tendency. Gross muscular weakness is characteristic and sometimes misleading; Albright has suggested it may be due to lack of Vitamin E.

Skeletal symptoms such as bone pain, spontaneous fracture and deformities may be the cause of the patient seeking advice. The radiographic changes include generalized demineralization; collapse of vertebral bodies, and localized strips of decalcification, (the 'umbau-zonen' of Looser). The latter affect characteristically the axillary borders of the scapulae, the femoral necks, the ischio-pubic rami, the ribs and the metatarsals. The presence of radiographic signs of osteomalacia indicates that the condition is of long standing.

There is a lowering of either serum calcium

or serum phosphorus, or of both. Despite excessive formation of osteoid and a raised serum alkaline phosphatase the solubility product of calcium and phosphate is not sufficient to permit precipitation calcium in the bone matrix.

Stool analysis usually shows increased fat content, but absorption may be normal at times and a fat balance may be required to establish the diagnosis of steatorrhoea.

Case History

Miss G.F. aged 47 years, was admitted to the Royal National Orthopaedic Hospital in August 1953, having been referred by Mr. Ross Smith.

Her main complaints were of widespread pain in her bones for two years, and of severe muscular weakness gradually increasing over the last six months, so that she could scarcely walk about the house. In June 1952 she sustained a fracture of her left tibia: this was still painful and she was wearing a caliper on the left leg. The poor mineral content of the bones was noted at the time of the fracture (Fig. 3), and she was given sex hormones for many months without effect.

At first she said that her bowels were normal, but detailed questioning revealed that she passed four or five pale, bulky, unformed stools a day; and had done so for as long as she could remember. She had come to regard this as normal.

Physical Examination

The patient was a frail little woman only 54 inches (137 cm.) in height, wasted and with a protruberant abdomen. Her weight was 76 lb. (34 kg.). There was a general dorsal kyphosis, some femoral bowing and genu valgum (Fig. 1). Hypotonia and muscular weakness were marked.

FIG. 3.—Antero-posterior and lateral views of the left tibia and fibula, showing general demineralization, and fractures.

She could not raise her arms above her shoulders or sit up unaided. There was some clubbing of the fingers, with signs of chronic bronchitis and emphysema. The blood pressure was 210/100. Pigmentation was absent.

Investigations

Radiographs showed gross generalized decalcification (Figs. 3 and 4). The spine showed a moderate dorsal kyphosis, and 'fish vertebrae' in the lumbar region. There were pseudo-fractures in each ulna and clavicle (Fig. 2). The tibia showed some bowing and there were two sites of buckling of the thinned cortex in the upper third of the left tibia and fibula (Fig. 3).

<i>Blood Counts:</i>		26.8.53	30.10.53
Hb. per cent...	..	70	85
R.B.C.		3,860,000	
W.B.C.		8,500	

<i>Biochemistry:</i>			
Serum Calcium	..	8.5 mg. %	9.2 mg. %
Inorganic phosphate	..	2.8 mg. %	4.8 mg. %
Alkaline phosphatase (phenol units)	..	28.2	33.6
Blood urea		21.0 mg. %	
Serum proteins	..	6.6 mg. %	
Albumin		4.0 mg. %	
Globulin		2.6 mg. %

FIG. 4.—Radiograph of the right hand of the patient and the radiograph of a normal woman of the same age, taken at the same exposure, to show comparative densities.

<i>Faecal Fat Percentages:</i>	26.8.53	22.9.53
Total	56.5	55.1
Unsoaped fat ..	29.5	27.9
Free fatty acid ..	23.0	20.6
Fatty acid as soap ..	27.0	27.2
Neutral fat	6.5	7.3

Urine: A trace of albumin. No Bence-Jones proteose.

Prothrombin time: normal.

Glucose tolerance test: normal.

The Diagnosis

The diagnosis of osteomalacia was made on the basis of the radiographic appearances and typical changes in serum calcium, phosphorus and alkaline phosphatase. The typical stools and clubbing of the fingers made idiopathic steatorrhoea almost certain and this was confirmed by stool analysis.

Treatment

This followed standard lines of a low fat diet, calcium lactate (gr. 90 daily), and vitamin supplements (including 100,000 units of vitamin D and folic acid 10 mg. daily). Iron was also given by mouth.

Progress

On this treatment the patient's general condition improved dramatically. She soon felt better and after ten days began regularly to pass one formed stool a day. The bone pains steadily resolved and after a month she was able to walk about the ward with two sticks. Within four weeks the radiographs showed some recalcification at the site of the pseudo fractures and in the callus around the tibial fracture. During the period of observation of two months her anaemia improved and the serum calcium and phosphate increased. On the other hand the faecal fat analysis showed little change, nor was there any increase in weight. On discharge, muscular power had so far recovered that she was quite independent, and she was free from pain.

Discussion

This case was at first thought to be one of osteoporosis and was treated as such. The low serum calcium and phosphorus and high serum alkaline phosphatase showed that in fact it was osteomalacia. Though the symptoms had only become severe in the last two months, the history

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and the small stature suggest that the condition was lifelong. The history of diarrhoea was only obtained by careful questioning though even normal bowel habits do not exclude steatorrhoea. The response to treatment was most gratifying, progress from being practically bedridden, and racked with pain, to comparative fitness and complete comfort in a matter of weeks.

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