

OSTEOCHONDRITIS AND TUBERCULOSIS *

A DEMONSTRATION OF CASES OF CALVÉ'S DISEASE OF THE SPINE AND KÖHLER'S DISEASE OF THE TARSALE SCAPHOID, WITH A DISCUSSION ON THEIR RELATIONSHIP TO TUBERCULOSIS.

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Introduction.—I have brought across with me three cases which I felt might afford you some little interest, the first two because of the extreme rarity of the condition with which they have been affected, and the third because it may shed some light on the etiology of that condition.

The first two cases are examples of Calvé's disease of the spine, a condition which has to be differentiated from Pott's disease, and which is to tuberculous caries of the spine what Perthes' disease is to tuberculous coxitis, with this important difference that it is much less common.

It is because of its rarity that most people have rather a hazy idea of its nature, a haziness which is not greatly clarified by the meagre or rather vague description given in most of the current textbooks on orthopædics.

We all know that it is classed as an osteochondritis, that it is to the spine what Perthes' disease is to the hip, and that the diagnosis is made on X-ray appearances, but until we have actually seen a case we are apt to be in this position that when confronted with the X-ray film of a supposed tuberculous caries which does not look quite typical, we may say: "There's a touch of Calvé about that" or "That may be a case of Calvé's disease." Such a position is quite wrong, for Calvé's disease is a very definite radiological entity, just as definite as is Perthes' disease of the hip and once seen it is never forgotten. The trouble is that the condition is so uncommon that few have an opportunity of seeing it at all.

When Calvé first described the condition in a paper read before the British Orthopædic Association at Bologna in 1924,¹ he had only one case of his own, and one which he had observed in the hands of a colleague. In 1928, four years later, when

* Read at a Meeting of the Tuberculosis Society of Scotland held at Robroyston Hospital on 26th September 1941.

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he wrote his essay for the Robert Jones Birthday Volume,² he had managed to collect only 9 cases, and no more personal cases. In 1935 Sundt,³ a Norwegian orthopædist, combed the world literature and was able to gather 21 recorded cases, of which several were not Calvé's disease, and some were indeed a variety of tuberculous caries to which Calvé particularly drew attention as requiring to be distinguished from the condition which he described.

Frequency.—During ten years' work among subjects of surgical tuberculosis, I have perhaps been fortunate in coming across two examples of Calvé's disease. The first has already been recorded in the *British Journal of Surgery*.⁴ The second is being demonstrated for the first time to-day. These two cases occurred among 397 patients admitted to hospital with a diagnosis of spinal caries. Of this total, 336 proved in fact to be suffering from spinal tuberculosis, so that in this series the proportion of Calvé's disease to Pott's disease was 2 to 336, or .6 per cent.

Clinical Features.—Calvé's disease usually comes under medical attention as a probable early or mild tuberculous caries. As in tuberculosis the onset is insidious, and gross changes are usually present in the affected vertebra when first seen. There may be a history of injury, usually slight, or there may have been some pain, local or referred, occurring spontaneously or only during exercise. A small gibbus may be present and local tenderness can usually be elicited by fistic percussion over the affected region. Spinal rigidity is almost always present in the early stages. In Case 1 it was pain, at first only during exercise but later continuous, which drew attention to the disease. Case 2 is described below.

Apart from a possible negative tuberculin reaction the clinical picture at the outset might well be that of early spinal caries. The progress is, however, uncomplicated by abscess formation or paraplegia and no gross deformity occurs. The ultimate result is therefore, as in Perthes' disease, much better than in the corresponding tuberculous lesion.

CASE 2.—A. K. Admitted to Mearns Kirk Hospital on 13.1.38 at age of 10 years. Three months previously he had complained of pain in the back on jumping. At school "round shoulders" were observed and he was referred to the orthopædic clinic where examination revealed boarding of the

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dorsal spine, localised tenderness at the level of the 6th dorsal vertebra, and a small knuckle kyphosis. Early Pott's disease was suspected. X-ray revealed a typical Calvé's disease of D.V.6.

There was no predisposing injury or disease. Family and personal history were negative for tuberculosis. The tuberculin test was negative.

Treated on spinal carriage in hyperextension for 7 months. Plaster jacket for 2 months and then up in spinal brace. Discharged on 20.11.38 with good spinal mobility.

No further trouble. Serial X-rays showed regeneration beginning late in 1941. See Plate I.

X-ray Appearances.—It is in the radiological field that the characteristic features of the disease are to be sought. These are simple and definite. The body of the vertebra is reduced to a thin disc of increased density—the vertebra plana. The intervertebral spaces are hardly affected. They are not reduced as in tuberculosis and indeed may be wider than normal, in accordance with the formula for osteochondritis—less bone and more cartilage. Regeneration of the vertebral body occurs to a considerable degree, although the body never resumes its normal size. Such regeneration does not occur in tuberculosis. Finally, only one vertebra is affected. This is important, for tuberculosis of the spine always affects at least two bodies.

Diagnosis from Lamellar Tuberculosis of the Spine.—There is one type of tuberculosis, however, the lamellar type of the disease, most commonly encountered in the lumbar region, which may simulate Calvé's disease. Here the "flattened body," sometimes of increased density, really represents two collapsed bodies, a point which is easily verified by the presence of two neural arches attached posteriorly to the flattened mass. An example of the condition may be seen in Plate II. Calvé drew particular attention to this point, yet among the cases collected by Sundt there were several reported as Calvé's disease which were, in fact, examples of this type of spinal tuberculosis.

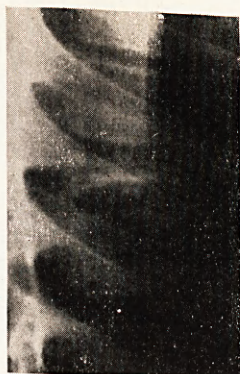
Radiologically, then, Calvé's disease is easily distinguished from tuberculous caries by the appearance of the flat body of increased density, the absence of loss of intervertebral space, the regeneration of the body, and the fact that only one body is affected.



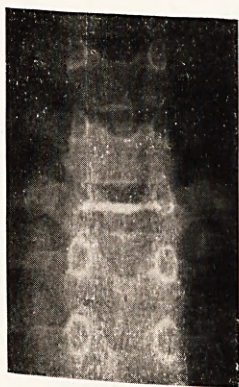
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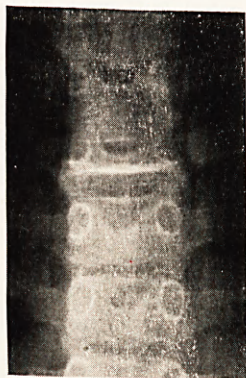
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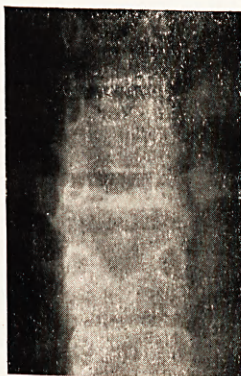
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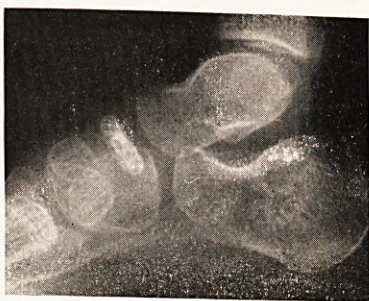
PLATE I.—Osteochondritis of Vertebral Body (Calvé's Disease or Vertebra Plana). Only one vertebra is involved—the 6th dorsal vertebra. The body is reduced to a flattened disc of increased density. The intervertebral spaces are not diminished. In the latest films (4.8.41) regeneration is beginning.



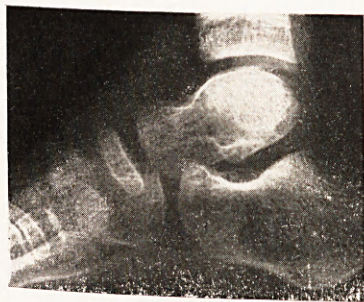
PLATE II.—Tuberculous Caries of Lumbar Vertebrae. Lamellar type simulating Calvé's Disease. Note two neural arches. (P.R. 12.1.40.)



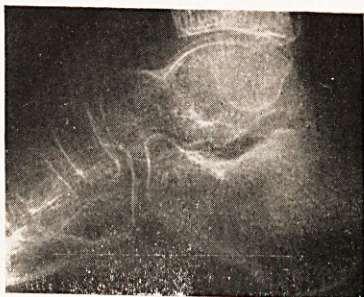
8.10.37



9.2.38



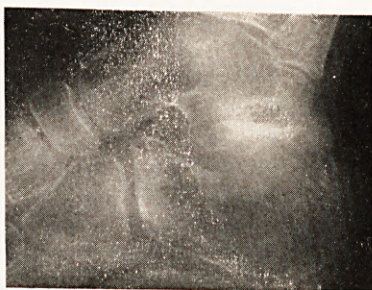
16.5.38



10.6.40



31.7.40



9.1.41

PLATE III.—Köhler's Disease and Tuberculosis: Köhler's Disease of the Right Tarsal Scaphoid followed by Tuberculosis of the Right Sub-astragaloid Joint.

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Treatment.—Clinically the disease is mild and runs an uncomplicated course ending with a spine in which, apart from the X-ray appearances, little abnormality can be detected. Spinal mobility is usually good. Only young people during the period of growth are affected.

Treatment need not be drastic, but relief from weight-bearing is necessary in the early stages to relieve any pain present and to minimise the collapse of the vertebral body. Recumbency and immobilisation for a period of 6 months are to be recommended, and thereafter support by a spinal brace for 12 to 18 months.

Etiology.—In discussing the etiology of this condition one enters the field of speculation. I am not aware that any case has been subjected to pathological investigation. There is, of course, an absence of material which could only be made available should a patient with active disease die from some other cause. One is not on certain ground either in drawing comparisons between different conditions grouped under the heading of osteochondritis. Yet I would like to speak for a moment of one of these conditions which has been found on many occasions to be associated with tuberculosis. I refer to *Köhler's disease of the tarsal scaphoid*.

I have brought for your inspection the most recent example of this association which has come to my notice. It is the case of a boy who came under my care in 1937 with a very definite Köhler's disease of the right tarsal scaphoid. The condition was so mild that one was in doubt as to whether serious treatment should be undertaken. There was practically no swelling or pain, the only external sign of trouble being a slight limp. The foot was immobilised in splints for five months and then a walking iron was fitted. He was discharged in good general condition with no apparent disability. Serial X-rays reproduced in Plate III showed gradual restoration of the scaphoid to normal. His further progress was uneventful till in 1940, two years after discharge, a limp again developed, and he was sent to me because of swelling behind the right ankle. X-rays showed tuberculosis of the posterior part of the right sub-astragaloid joint, for which he was readmitted to hospital. The diagnosis has not been proved bacteriologically in this case, but the clinical and X-ray appearances will be sufficient to satisfy most minds, although the healing has been very good.

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This case is not an isolated one in my experience. I should like to show you some pictures and the X-ray films of the case which first brought this point to my attention. The patient, a boy, 6 years of age, was admitted with the diagnosis of Köhler's disease, this diagnosis being based on the report of a competent radiologist. On clinical examination the right foot was found to be greatly swollen, red, warm, and broken down with several large discharging sinuses on the medial side. In view of these findings I was unable to accept the suggested diagnosis but regarded the case as one of tuberculosis of the tarsus. Subsequent X-ray examination, however, produced a picture of considerable interest. The scaphoid was thin and of increased density, definitely suggestive of Köhler's disease. Soft tissue swelling was marked and there was erosion of the proximal articular surfaces of the cuneiforms. The appearance of the scaphoid of the other foot was worthy of note, for although it was not typical of Köhler's disease it was definitely abnormal and tended in that direction. It was thin and of irregular contour with an increase of density at its lateral extremity.

The right foot flared and required surgical intervention. Material from the right tarsus yielded a growth of tubercle bacilli. A definite diagnosis of tuberculosis of the tarsus was therefore made, but there appeared to be three possibilities :

- (1) This was a case of tuberculosis of the tarsus probably originating in the scaphoid, but, if so, one was forced to the conclusion that tuberculosis could closely simulate Köhler's disease to the extent of misleading a competent radiologist.
- (2) It was a case of Köhler's disease, on which tuberculosis of the tarsus had been superimposed. A diagnosis of primary Köhler's disease seemed to be supported by the appearance of the left scaphoid.
- (3) Köhler's disease and tuberculosis of the scaphoid are one and the same thing, the title "Köhler's Disease" being applicable when the disease is mild and remains localised to the scaphoid, but when the disease flares, invades contiguous joints and adjacent bones, with perhaps abscess and sinus formation, the diagnosis of tuberculosis becomes possible.

This third possibility could be easily checked by showing

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that tuberculosis of the scaphoid is quite different from Köhler's disease. Consequently, a search was made for some examples of tuberculosis originating in the developing scaphoid in order to demonstrate the difference. The search, so far as our series was concerned, proved strangely unsuccessful. It was found that although there were numerous examples of tuberculosis of all other tarsal bones, numerous cases of tuberculosis of the tarsus in which the scaphoid had become secondarily involved and several cases of ordinary mild Köhler's disease, there was only one case which had been diagnosed as tuberculosis of the scaphoid. This diagnosis had been made in the case of a boy of 6 years of age, admitted with a healing scar over his left scaphoid. A year previously a swelling on the medial side of the foot had infiltrated the skin and been incised, leaving a sinus which discharged for six months. In the following six months the sinus had healed and broken down repeatedly. On admission it was healed, but broke down a few days later. Ultimate healing was secured. The X-ray films showed appearances very like those of Köhler's disease. Two years later the boy developed pulmonary tuberculosis.

Most orthopædist admit the association between Köhler's disease and tuberculosis. Is there any association between tuberculosis and the other conditions classed as osteochondritis? They are at least clinically associated in that, without X-ray facilities they would be, and were, diagnosed as mild tuberculous lesions. They *may be* mild tuberculous or mild infective lesions and the characteristic X-ray appearances may simply represent the response of developing bone, at certain sites, to a mild infection, tuberculous or otherwise.

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- ³ SUNDT, H. (1935), *Acta chir. Scand.*, **76**, 501.
- ⁴ DALE, ALEX. (1937), *Brit. Journ. Surg.*, No. 98, **25**, 457.