

AN UNUSUAL CASE OF TUBERCULOSIS OF THE KNEE JOINT

By

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During the period 1940 to 1943 an unusual case of tuberculosis of the knee was treated in the Orthopaedic Department of Malmö General Hospital. The case was almost unique in so far that, in spite of large, extensive destructions of the knee joint, it healed with full restoration of function and with almost normal conditions in other respects, i.e., full mobility, well reconstructed bone structure and no subjective symptoms. The observation period following the termination of the treatment is, up to the time of writing, 8 years.

CASE REPORT

Journal 27/40. The patient's father was found to be ill with pulmonary tuberculosis in March, 1940, with positive bacillar findings in the sputum. In January, 1940, (2 month's before the detection of the father's open tuberculosis) when the patient was 2½ years old, he began to complain of pain in the left knee. His parents observed a slight swelling of the knee. The boy was immediately admitted to the Orthopaedic Department of Malmö General Hospital, where he was treated until May, 1942, under the diagnosis: Tuberculosis of the left knee with hilum tuberculosis. On admittance the sedimentation rate was 17 mm. per hour. The temperature during the first weeks in the hospital was around 38 C and it dropped slowly, becoming normal within 2 months. *Pirquet's reaction was positive.*

Local status in January, 1940: The entire region of the left knee joint was slightly swollen with blurred contours. The joint had full movement. There was a slight atrophy of the muscles of the calf and thigh.

Roentgenological examination on admittance in January, 1940,

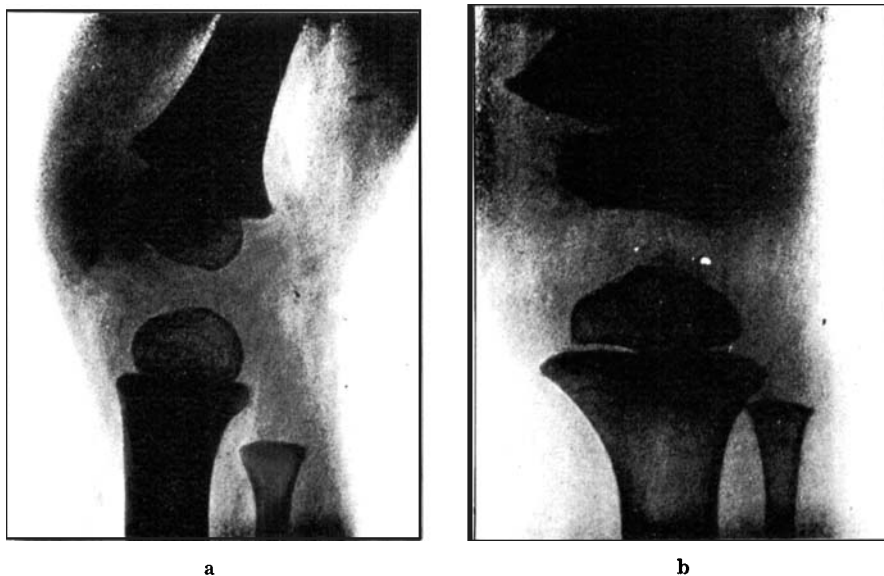


Fig. 1.

I. S. 18/3 1940

revealed distinctly increased density of the soft parts medially but no certain changes in the bone. Roentgenological examination on March 18, 1940, (fig. 1) showed a focus medially in the femoral epiphysis with a sequestrum-like shadow.

The process advanced further. In May, 1941, the patient developed an abscess on the front part of the thigh, at the suprapatellar bursa. Puncture yielded 30 cc *thick, yellow-green pus*. The abscess was apparently cold abscess and disappeared after 2 months. Culture of the pus on Löwenstein's medium was negative. Unfortunately no guinea-pig test was made.

Roentgenological examination on April 19, 1941, (fig. 2) and on October 21, 1941, (fig. 3) showed how the destructive process had markedly increased. It had reached the border-line between bone and cartilage in a large area and had also engaged the metaphysis. The joint space on the diseased side, however, was only slightly lower than on the other. During the following years roentgenological examinations (fig. 4, June, 1944) showed how the outlines of the destructions became more clearly delimited, the density increased, and how—the bone structure became more and more normal. A roentgenogram taken on June 10, 1950, (fig. 5) shows a knee joint that differs only slightly from the normal picture. The joint space is of normal height and the contours of the joint are sharp, although somewhat irregular on the

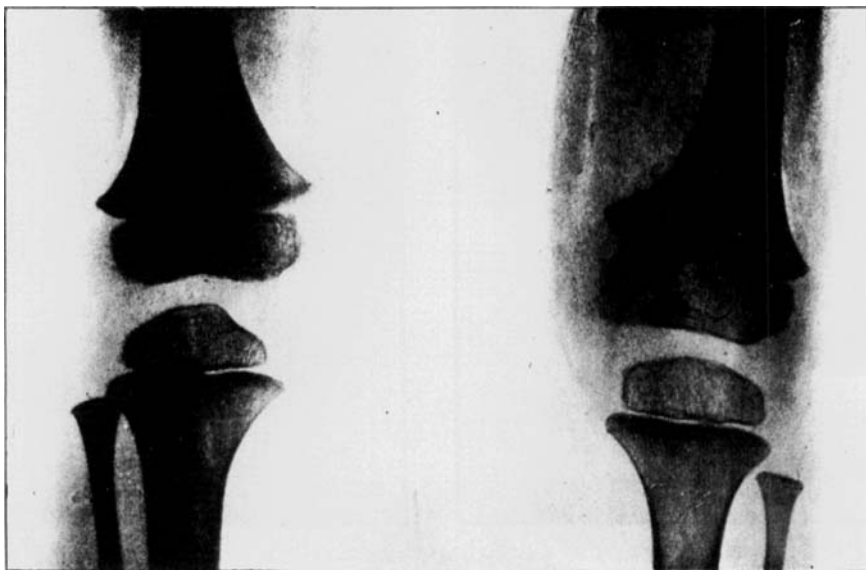


Fig. 2 a.
I. S. 19/4 1941



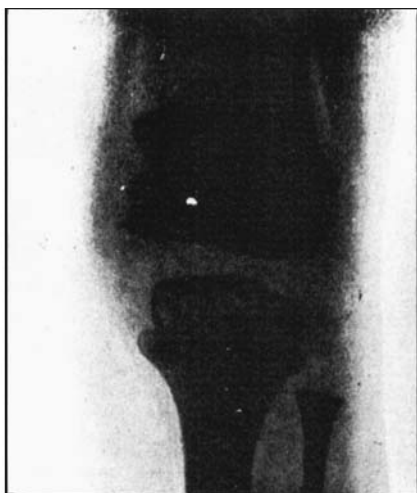
Fig. 2 b.

medial condyle. There is not much to be seen of the old destructions and the bone structure is almost normal.

Roentgenological examination of the lungs at the beginning of the hospitalization showed obvious adenitis of the hilus pulmonis, which, however, receded fairly soon.



a



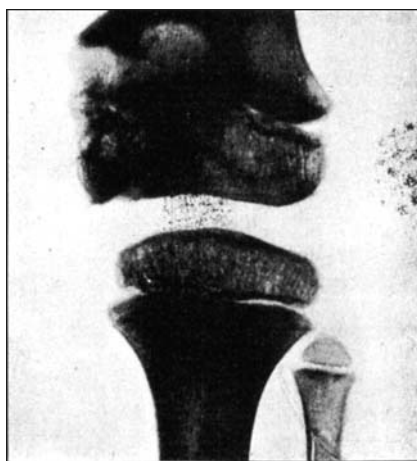
b

Fig. 3.

I. S. 21/10 1941



a



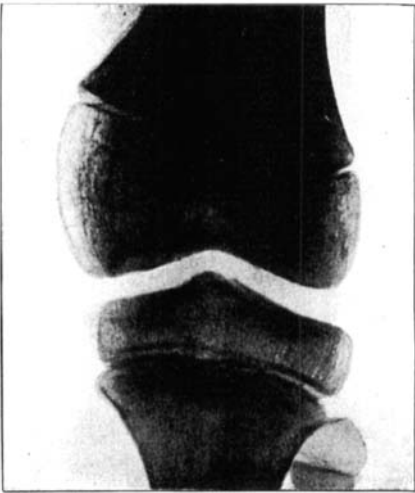
b

Fig. 4.

I. S. 26/6 1944



a



b

Fig. 5.
I. S. 10/5 1950



a



b

Fig. 6.
I. S. 26/9 1950

The treatment used was the one prevalent at that time: Immobilisation in plaster together with a generally vitalizing treatment. Naturally there was no antibiotic therapy, with PAS or any such preparations, as the patient was treated during the years 1940 to 1942. After dismissal from the hospital the plaster fixation was continued for a couple of months, lasting for $2\frac{1}{2}$ years altogether. After the removal of the plaster the mobility gradually increased. Within 6 months there was full mobility and thus has remained ever since. In recent years the patient has participated in physical training at school and has even been awarded on athletics badge.

Local status on September 26, 1950. There was no fluid in the knee joint, but a slight thickening of the capsule. The medial femoral condyle was slightly enlarged but was not tender. The patient could stretch and bend the knee freely and the mobility was equal in both legs (fig. 6). There was no instability in lateral or antero-posterior direction. The left leg was 2 cm. shorter than the right and there was $1\frac{1}{2}$ cm. atrophy of the muscles of the thigh and calf. The gait was faultless. The patient had no subjective symptoms.

DISCUSSION

The objection may be raised against the above diagnosis that tubercle bacilli were not found in the Löwenstein culture. Since it is well known, however, that this culture does not always give positive results on samples from confirmed tuberculous foci the diagnosis tuberculosis is thus by no means eliminated. The diagnosis of tuberculosis can be regarded as almost certain after taking into consideration the open pulmonary tuberculosis of the father, the positive tuberculin reaction at the age of $2\frac{1}{2}$ years, the clinical picture with a cold abscess, and, finally, the roentgenological findings, all of which argues very strongly in favour of a tuberculous etiology.

Tuberculosis of the knee joint is, like other forms of tuberculosis of bone and joint, practically always secondary to a tuberculous infection elsewhere in the body, usually in the respiratory or digestive organs. From a pathological-anatomical point of view two types of tuberculosis of the knee joint have long been differentiated.

1. The synovial type where the synovial membrane is infected via the blood-stream and where the infection at first is restricted to the synovialis. In favourable cases the process heals when only the synovialis and articular cartilage have been attacked. In other cases underlying bone tissue is affected and the articular surface are more or less destroyed.

2. The osseous type where the infection of the joint originates from an osseous focus in one of the epiphyses. When an osseous focus opens through the articular cartilage into the joint the infection spreads continuously, causing new destructions. These destructions are often so comprehensive that the congruence of the articular surfaces is disturbed, that is to say, the mechanical status of the joint is damaged.

It has long been known that cases of synovial tuberculosis of the knee may recover with full range of movement. Out of 9 cases Soutter (Boston) reports 3 cases of recovery with full mobility. Girdlestone (Oxford) reported in 1940 a series of 14 cases of synovial tuberculosis 9 of which healed with full mobility, i.e., two-thirds of the cases. The treatment was conservative and consisted of immobilization with plaster spica and bandage for 2 to 6 years. The time of observation following the removal of the splint was 2 to 6½ years.

In osseous tuberculosis of the knee, recovery with full mobility is considered almost impossible. Even recovery with fairly good movement, i.e., 60 to 90° flexion, is rare but occurs in every larger series of cases. Girdlestone is of the opinion that such results cannot be expected even when conditions are favourable, e.g. when the focus only attacks the non-weight-bearing part of the articular surface. The reason is said to be that the adhesions to the encapsuled focus would limit movement. There would always be a risk that the capsule would be damaged if the limits of movement were to be exceeded, resulting in an exacerbation of the process. He contends that a recovery with good but not full mobility is not sure and that ankylosis alone can give permanent security. In 1932 Girdlestone asked a number of experienced colleagues whether they had seen any case with an osseous tuberculous focus which had opened into the knee but which had healed with full mobility. Thirty-five answered "No", and some added that they did not believe it ever occurred.

It is impossible to say why the result was so favourable in the present case. The simplest explanation is, perhaps, that the articular cartilages remained vital in spite of the widely spread destruction, resisting the infection. Strictly speaking, the process would then have been "extra-articular". This seems rather improbable, however, in consideration of the extensive destruction seen in the roentgenograms, which must have given the overlying cartilage very little chance of survival. It is more likely that the focus opened into the knee through the destroyed cartilage but that in this stage the infection entered a phase of healing, the process thus becoming effectively encapsuled. The antibacterial defensive forces must thus have won at the very

last moment, preventing a more or less complete destruction of the knee.

The reconstruction of the bone structure in the focus appears clearly from roentgenogram No 5. Opinions differ as to the explanation of this phenomenon.

Collins (1949) thinks that encapsuled caseous masses can often be calcified but never ossified. Konschegg is of the opinion that healing from an anatomical point of view does occur, although rarely. According to the latter the defect is first filled out with fibrous tissue, which is later calcified and ossified, and finally unites with the surrounding bone. Kaufmann (1938) also believes that small, occasionally wide-spread, foci may heal spontaneously through encapsulation and bone formation.

CONCLUSION

An osseous tuberculosis of the knee usually results in a more or less destroyed joint, together with instability, painful movement, abscesses, etc: Sometimes the process ends in an osseous or fibrous ankylosis, a condition which is thought so satisfactory as to be the aim for our therapeutic efforts. In favourable cases the final result may sometimes be a knee with comparatively good function and partial mobility. The present author has been unable to find any case in the available literature like the one described in this paper. When one bears in mind the result of Girdlestone's inquiry, this case must be characterized as exceptional and as evidence that tuberculosis of the knee with bone foci recover with full restoration of function on rare occasions. By introducing into the therapy certain antibiotics, PAS etc., which have proved to have a favourable effect on the tuberculous infection, one may expect, with some justification, that cases with a equally favourable recovery will become more common.

SUMMARY

The author reports a case of tuberculosis of the knee which in spite of wide-spread destruction affecting the joint, healed with complete function. Conditions were also almost normal in other respects, i.e., full mobility, well reconstructed bone structure, and no subjective trouble.

RESUME

Description d'une cas de tuberculose du genou; malgré une destruction étendue, qui entama l'articulation, guérit complètement du point

de vue fonctionnel et rétablit des conditions tout à fait normales, à savoir mobilité parfaite, image osseuse bien reconstituée et absence complète de symptômes subjectifs.

ZUSAMMENFASSUNG

Der Verfasser beschreibt einen Fall von Kniegelenktuberkulose, der trotz grosser Zerstörung des Kniegelenkes, heilte voller Bewegungsvermögenheit und auch im übrigen unter beinahe normalen Verhältnissen, das ist, vollständige Beweglichkeit, gute Rekonstruktion der Knochenstruktur und keine subjective Beschwerden.

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