

ON THE TREATMENT OF SACRO-ILIAC OSTEOARTHRITIS

BY

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As few cases of sacro-iliac osteoarthritis treated by operation have been published in the Scandinavian literature, the following material is presented in order to illustrate the use of this more active treatment.

Since 1938, 13 out of 32 cases of sacro-iliac osteoarthritis at the Hospital of Surgical Tuberculosis at Juelsminde have been treated by operation.

Since *Sayre*, as early as 1879, reported 18 cases treated by operation there has been considerable difference of opinion on the indications for, and the results of operative treatment, as well as on the operative technique.

In 1888 *Weller van Hook* recommended early resection and osteotomy in cases with abscesses.

In 1921 *Smith-Petersen* described a special technique for intraarticular arthrodesis, and in 1926 he published with *Rogers* 13 cases of sacro-iliac tuberculosis treated by this method. The cases had been followed for 6 years; 46 % were completely cured and 23 % only partly, having persistent fistulae. Altogether, 69 % had returned to their original occupations. The prognosis was found to be worse in cases with abscesses.

Albee preferred to use extra-articular arthrodesis because of the risk of spreading the infection by opening a joint with an active tuberculous process.

In 1928 a committee, which had been appointed by the American Orthopaedic Association to investigate the problem, came to the conclusion that old, persistent cases could be helped, but "what to do in the cases of tuberculosis is a very great question",—and no definite conclusion was reached.

In 1934 *Petter* reported, from a study of 31 conservatively treated cases, that in cases of destructive caseous tuberculosis 3 to 4 years are

necessary for the destructive process to be replaced on the radiographs by osteosclerosis, the formation of new bone and the appearance of normal trabeculation.

In the same year *Hald* published 4 cases of histologically confirmed ilio-sacral tuberculosis treated by Smith-Petersen's method. Examination between 9 and 12 months after operation showed all of them to be without symptoms—in only one case had an abscess developed. He recommended operation in early cases without abscess formation; cases with abscesses were more difficult and should be considered separately.

In 1937, *Tolle* compared 14 cases treated conservatively with the operated cases published in the literature, and came to the conclusion that there was little difference between the results in the two groups.

In 1938, *Thompson* published the results of 23 tuberculous cases treated by operation over a period of 18 years. Operation had been the routine treatment unless the patient's condition was so bad that radical treatment would be dangerous. 74 % of the patients were discharged from hospital as cured, and no recurrences occurred over an average observation period of 4.9 years. 5 patients died within one year of the operation. Patients who had no other tuberculous foci were discharged after 4 months' stay in hospital, while those with other active manifestations were kept in bed until the signs of activity had disappeared. The aim of the operation was to remove the focus and cause bony ankylosis: a partial resection was done.

In 1943 *Viking*, discussing the disease in detail in his monograph, reported 50 cases of sacro-iliac osteoarthritis. 7 were treated by operation, but from his material he could conclude nothing as to the value of the more radical treatment.

In 1947 *Delchef* and *de Doncker* wrote that during a period of 20 years they had diagnosed sacro-iliac osteoarthritis in 22 cases—4 of them only at autopsy—and they found that it made up 3 % of the tuberculous bone and joint affections treated. In 11 cases extra-articular arthrodesis was done, using Verral's method, the two posterior iliac spines being connected by a bone-graft from the tibia. 5 of these patients were cured, 3 died, and 3 had been followed for less than 3 months. In 7 other cases it was not possible to graft, because of the presence of sinuses with mixed infections in the sacro-iliac region and partial resections were done instead. 3 out of these 7 patients were cured, 3 died and 1 was not re-examined.

In the same year *Tavernier* and *Geay* published a brief account of a 10 years material consisting of 28 patients operated by Smith-Petersen's method. 11 of them had tuberculous sacro-iliac osteoarthritis with abscess formation, but without sinuses. Out of these 11 cases, 3 died; 3 developed fistulae post-operatively, but healed within 3 to 6 months. The patients were able to return to work between 12 and 15 months after operation.

THE MATERIAL

This material consists of 13 patients, 6 male and 7 female.

The *symptomatology*, having been discussed in detail in the literature, will here be described in broad outline only.

The first symptom in all the patients was *pain*, described as severe low back pain or pain felt posterior to the affected joint, suggesting sciatica in about half the cases (7 had had prolonged physiotherapy without relief). The pain disappeared with rest in bed, but soon returned with movement, or on standing.

In 12 of the cases one or more *abscesses* developed, usually associated with tiredness, pain and fever (38-39° C.).

In 75 % of these cases with abscess formation *sinuses* appeared, either spontaneously or after aspiration or incision.

The signs were: slight *limp*; moderate *muscle atrophy* of the lower limb; and positive *Lasègue's sign* at about 50°; *pain in the joint on indirect pressure* occurred in about half the cases.

All the cases showed *radiographic* pictures which were diagnostic: a typical osteoarthritis with increased joint space, irregular outline of the articular surfaces, and varying degrees of destruction of the sacral and iliac alae. In 4 cases there was 3-5 mms. upward dislocation at the symphysis on the affected side.

Fig. 1 shows the typical radiographic changes in a left sacro-iliac joint.

In all cases but one the affection was unilateral.

The *etiology* was tuberculous in 7 cases (group 1), pyogenic in 5, and non-specific degenerative, with allergic manifestations in other joints, in 1 case (group 2).

Group 1. 3 males and 4 females; the average age at onset of symptoms was 24.5 years, thus coinciding with the appearance and closure of the sacral and iliac epiphyseal lines. As a matter of fact the sacro-iliac joint is rarely the site of inflammation after the age of 30—if it is affected, it is usually

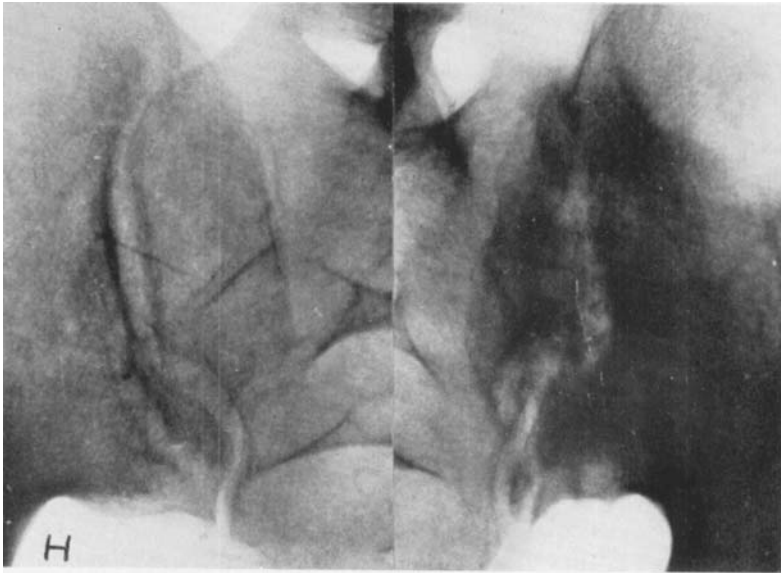


Fig. 1.

involved by direct spread of an abscess or granulation tissue from a tuberculous osteomyelitis of the dorso-lumbar spine. This is certainly due to the degenerative changes which affect the joint with increasing age and result in bony ankylosis. *Sashin* described these age changes after examining the sacroiliac joints of 257 autopsies on cases dying from other conditions.

In 4 patients the *route of entry* was pulmonary; in 3 of these a pleuritis serosa was the first tuberculous manifestation; 3-4 months later the joint affection was indicated by pain, and after a further 3-5 months an abscess appeared. Thus the osteoarthritis appeared clinically soon after the tuberculous primary infection, which is assumed to be closely related to the time of development of the pleurisy.

In 3 cases the route of entry could not be determined.

2 patients had other active tuberculous foci: 1 of them had a mild tuberculosis of the hip and 1 a sputum-negative pulmonary tuberculosis.

The interval between onset and operation varied between 9 months and 4 years, with an average of 2.4 years.

Abscesses were present at the time of operation in 6 cases, 4 of these had had sinuses for 4-18 months; in 1 the fistula had been closed for 1 month after a long course of treatment with penicillin, but had re-opened.

The site of the abscesses and the number of fistulae are shown in the following table:

Site of abscess	Sinus
Iliac fossa	0
” ”	0
” ” + gluteal region + intrapelvic.	2
” ” + trochanteric region	2
” ” + lumbar region	2
Lumbar region	1

Tuberculosis (human type) was verified in 6 cases, either bacteriologically, by culture and inoculation of pus or material from the focus, or histologically, by examination of the latter.

In the remaining case, where there was no abscess, a necrotic, calcified focus was found; histologically there was no evidence of tuberculosis and no tubercle bacilli or other pathogenic bacilli could be cultured, but the slow course of the disease over 4-5 years and the simultaneous tuberculosis of the hip are strongly suggestive that the condition was tuberculous.

In all 7 cases the Mantoux I test (0.01 mg.) was positive (at least 10 mm.).

The *pre-operative treatment* consisted of “general sanatorium cure” to restore the general condition, and universal carbon arc-light baths, whose importance we believe to be mainly as a skin-disinfected and consequently as a preventative of mixed-infection in fistular cases.

If the patient had not previously had adequate conservative treatment he lay in a plaster bed extending from the lower thorax to the toes, for 9-16 weeks, in order to abolish the

pain by relaxing the lumbar and gluteal spasms and to immobilise the joint and thus rest the affected area.

Cases of mixed-infection, with intermittent periods of fever, raised staphylococcal and anti-streptolysin titres, and "other bacteria" in the pus from the copiously discharging sinuses, were intensively treated with sulfathiazole or penicillin according to the chemotherapeutic sensitivity of the bacteria.

The abscesses were aspirated frequently, and always immediately before operation.

The time for operation was decided by consideration of the patient's general condition, the temperature chart, the sedimentation rate, and the radiographs.

The *post-operative treatment* was essentially as the pre-operative. 7-12 weeks after operation the patient was taken out of his plaster bed and began to get up.

1 patient with sinuses died 24 hours after operation from a rapid sepsis due to mixed-infection. This death might certainly have been avoided if the antibiotics now in use had been available at that time (1942)—and it serves to emphasise the need for effective pre-operative treatment of mixed-infection.

After operation the abscesses re-appeared slowly, if at all. The sinuses gradually ceased to discharge and healed within 3-10 months. 1 case developed an abscess in the gluteal region 1 year after operation; it healed after incision and there has been no further abscess or sinus for 4 years.

When the fistulae were healed, the patients were discharged and told to spare themselves for the first few months out of hospital.

The average stay in hospital was 10 months (5½-19 months).

Two patients were able to return to full work 3 months, one 6 months, and three from 12 to 18 months after discharge from hospital.

The patients have been followed for an average of 3 years (6 months to 6 years) after operation; all are able to work and all the sinuses remain healed. In 1 case, a woman, a sinus

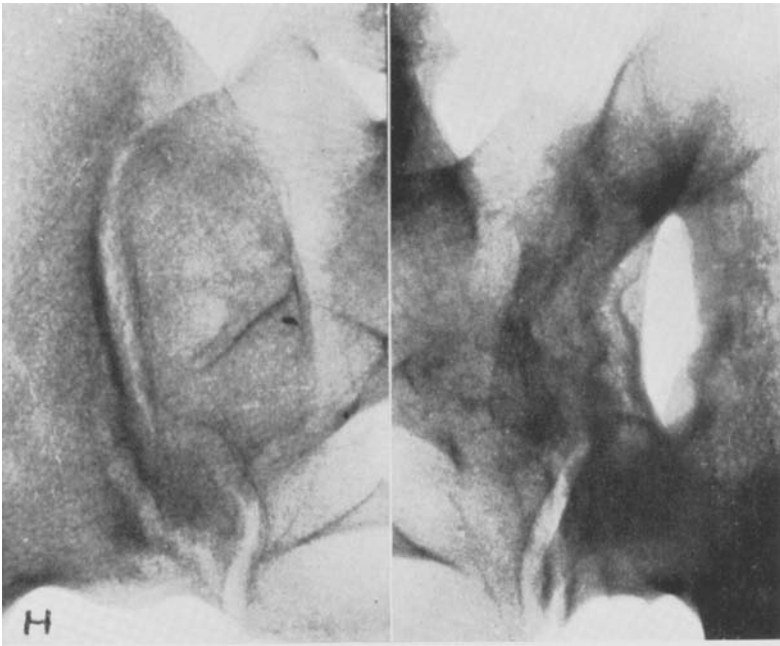


Fig. 2.

developed from a tuberculosis of the spine 2 years after operation, but the sacro-iliac disease was then, and is still—4 years after operation—healed, both clinically and radiographically (see fig. 2, same case as fig. 1).

At re-examination the only complaints were of “a little tiredness across the low back and in the operation scar” after prolonged hard work.

Examination showed slight atrophy of the thigh (1-3 cm.), and in one case slight stiffness of the affected side. Lasègue's sign was negative, though in 2 cases there was slight tightening of the muscles at 60°. There were no radiographic signs of activity at the site of the focus.

Group II. 3 males and 3 females; the average age at onset of symptoms was 19.7 years.

The 5 cases of pyogenic osteoarthritis all were abscess-forming with either constant or intermittent discharge for

18 months to 24 years, with periods of fever, pus retention and subsequent increased discharge.

The pre- and post-operative treatments were essentially the same as in Group I.

There was one death: the patient who had had for 11 years a discharging staphylococcal osteoarthritis of the sacro-iliac and hip joints died of sepsis 4 years after operation; the sinuses had never healed. As in the case already mentioned in Group I, the outcome might probably have been different if effective chemotherapeutic drugs had been available at that time.

In 3 of the patients the sinuses closed respectively $1\frac{1}{2}$, $2\frac{1}{2}$, and 3 years after operation, and have remained healed since, for between $2\frac{1}{2}$ and 4 years. The patients are able to work and are clinically cured; radiography shows healing with ankylosis of the joint.

The case with disease of both sacro-iliac joints and bilateral abscess formation, with sinuses for $3\frac{1}{2}$ years, was treated by partial resection of the worse side; the intention was to operate also on the other joint, but 18 months after the first operation there was both clinical and radiographic healing, and the sinuses were soundly healed, so that no further operation was done.

1 patient had had a discharging staphylococcal osteomyelitis of the right ilium with involvement of the sacro-iliac joint for 24 years. A partial resection of the joint and of the posterior $\frac{1}{4}$ of the iliac crest was done. After prolonged penicillin therapy she was discharged, 2 years after operation; only 2 of the numerous profusely discharging sinuses remained, and only occasionally a few drops of pus were discharged. Now, 9 months later, these 2 fistulae are closed after 3 week's treatment with streptomycin.

The remaining patient, a woman aged 35 years, had for 8 years had periodic disabling sciatica as the only symptom of a left sacroiliac disease; there had never been an abscess. Further, there was a mild arthritis with serous effusion of both knees, the right shoulder and right elbow. The sedimen-

tation rate was slightly raised; the staphylococcus anti-toxin and antistreptolysin titres were within normal limits; the Mantoux I was positive.

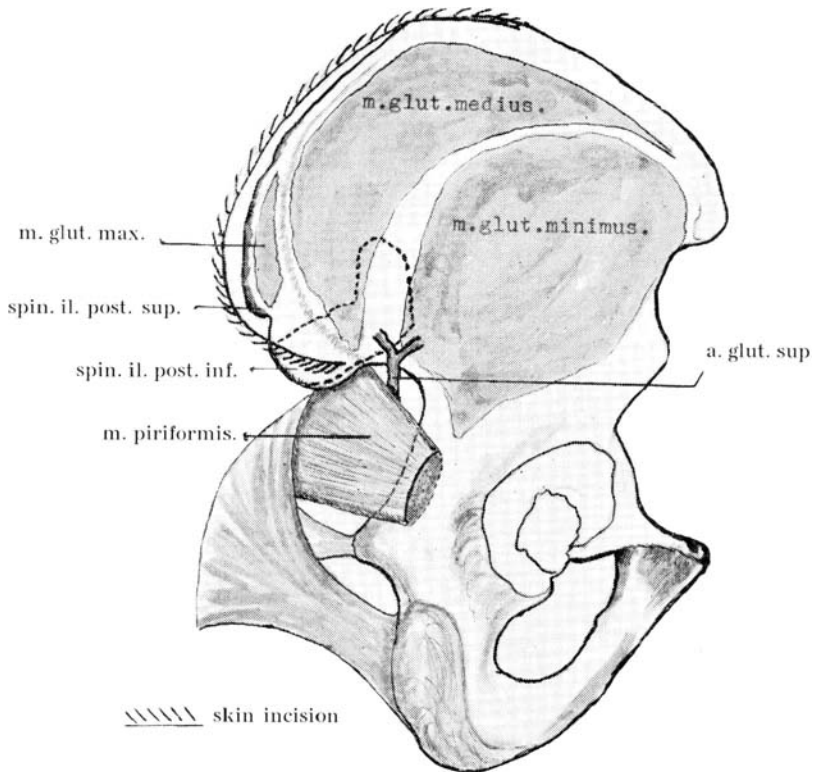


Fig. 3.

At the operation degenerative cartilage and necrotic bone were found; both bacteriological and pathological examinations were negative; no bacteria were cultured, and histologically there was only a serous effusion into the marrow spaces and formation of oedematous connective tissue.—The wound healed on the 12th. day.—9 months later, there was bony ankylosis, and now, 3½ years later, the patient has still no pain, and in addition the signs and symptoms in the other joints have disappeared.

One must assume this case to have been a non-specific serous sacro-iliac osteoarthritis with secondary allergic, effusive reactions in other joints, as there were no radiographic bone changes and culture of fluid from the joints was negative.

The Wassermann, Gono and Widal tests were negative in all 13 patients.

The *surgical technique* used is described briefly here:

A curved incision is made along the posterior part of the iliac crest, and carried behind the upper posterior iliac spine and downwards and forwards across the lower posterior iliac spine to the sciatic notch. Here the muscles and ligaments are detached to give a mass of skin and muscle which is pulled down together with the superior gluteal artery, which is carefully preserved. When the ilium is exposed the sciatic notch and the two posterior iliac spines serve as guides; the bone anterior to the latter carries the joint surface on its medial side, and access to the joint is obtained by chiselling it open.—Fig. 3 is a diagram of the skin incision and the anatomy.

Granulation tissue and all bone and cartilage which appears to be pathological is scraped away. The cavity thus produced is drained by a rubber drainage-tube, and the wound is sutured in layers.

In one case intra-articular arthrodesis was also done by inserting a bone-graft from the ilium.

“Primary healing” occurred in 3 cases; in the remainder the site of the drainage-tube healed within 11-20 weeks.

The aim of the operation is twofold: to remove the focus of the disease, thus preventing further destruction and abscess and sinus formation, and to ankylose the joint, thus reducing the risk of recurrence. Both these aims are attained by only partial resection.

That ankylosis takes place is shown both clinically by the absence of pain, and radiographically by a more or less complete bony union between the joint surfaces within 3-6 months.

Fig. 4 shows the radiographs of the same patient as in *Fig. 1* 3 months after operation. The operation defect can still be seen; 4 years later it is reduced by $\frac{1}{3}$ (*Fig. 2*).

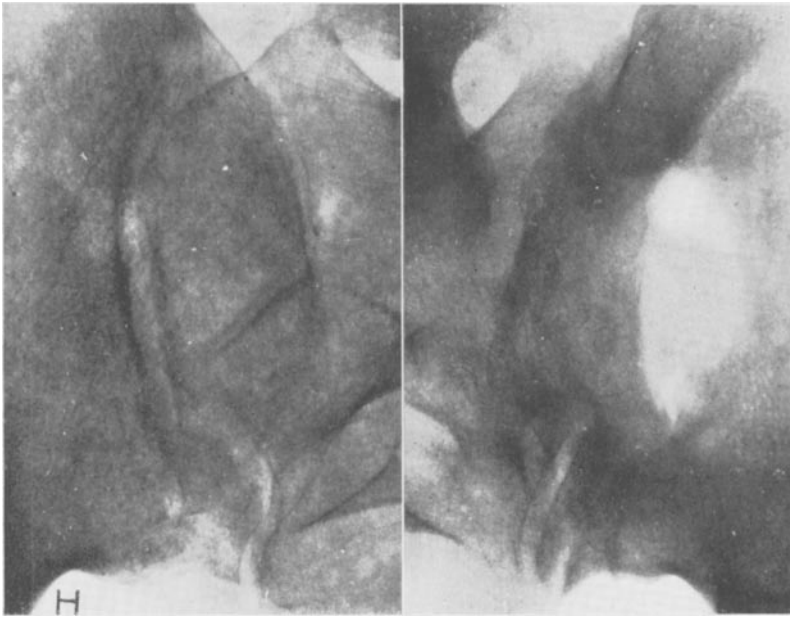


Fig. 4.

Although the number of cases treated has been rather small it may be justifiable to set out the following *indications for operation* in cases of sacro-iliac osteoarthritis, of both tuberculous and pyogenic etiology:

1) if the sacro-iliac disease is either the only or the main active focus, and abscesses re-appear in spite of repeated aspiration and adequate conservative treatment for 3-4 months.

2) if there are sinuses which show no tendency to healing after several months' conservative treatment.

3) in cases of caries sicca with continued pain and consequent inability to work.

The danger of pyogenic sepsis is insignificant with modern chemotherapy; similarly a general tuberculous spread, which is very rare and too much feared, following interference with a tuberculous focus may be prevented or stopped by streptomycin.

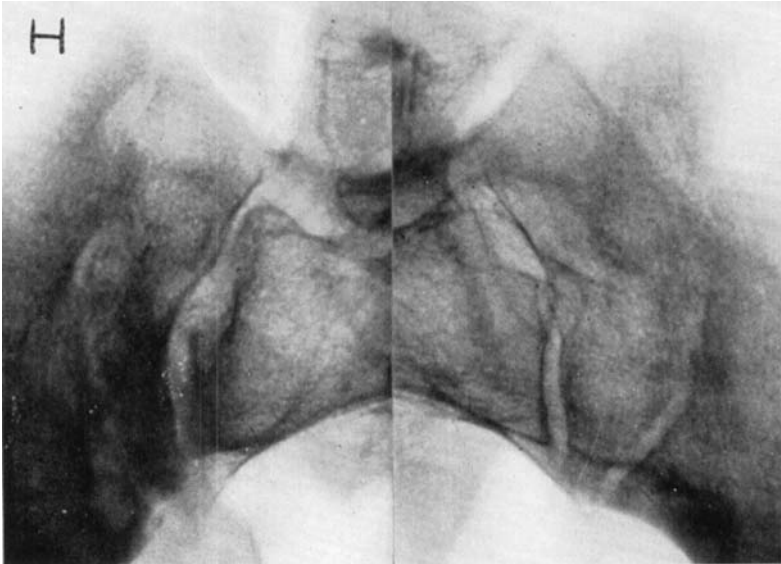


Fig. 5.
On admission.

Exclusively conservative treatment should be used in tuberculous cases, when there are other foci of bone or viscera which require a long conservative treatment, so that an operation on the sacro-iliac joint will not hasten the patient's return work.

In conclusion, the following report is given of *a typical case*:

A small-holder, aged 25 years, developed pain across the right loin and down the back of the right thigh in Dec. 1946 (2-3 months after the appearance of a left tuberculous pleurisy with effusion).

He was admitted to hospital in Feb. 1947 and treated for 2 months by rest in bed, heat, and massage for lumbar-gluteal myositis, but there was no improvement.

Further examination of the radiograph of 17.2.47 showed that at that time there were already signs of disease in the right sacro-iliac joint, the joint space being increased, with blurred outlines of the joint surfaces.

Radiography of the lungs showed no abnormality beyond a small

area of calcification the size of a pea in the left lung. Tubercle bacilli had never been found in the gastric contents.

In Aug. 1947 there was increasing pain, and an abscess developed in the right inguinal region; tubercle bacilli were cultured from the contents of the abscess.



Fig. 6.

7 months after operation.

Radiography on 29.9.47 showed irregular destruction of the R. sacro-iliac joint (Fig. 5), and urography showed medial displacement of the R. ureter by a shadow which suggested an abscess.

On admission here, 17.11.47, an abscess the size of an egg could be felt in the R. inguinal region; the Lasègue test was positive at 60°; there was 1 cm. wasting of the R. thigh and leg; the sedimentation rate was 28 mm.; Mantoux I was positive.—No other abnormalities were detected.

The patient was kept in a plaster bed for 8 weeks and was given carbon arc-light treatment. The abscess was aspirated twice, and 15 ml. pus were obtained; a sinus developed at the puncture site. On 26.1.48 a

partial resection of the joint was performed, using the technique described above. The joint was found to be filled with necrotic bone and cartilage and abundant granulation tissue communicating by a track, as wide as a finger, with the abscess. The operation and post-operative course were uncomplicated. The drain was removed on the third day and the sutures on the 10th day, at which time the wound was healed. Material removed at operation showed tuberculous pathology histologically, and tubercle bacilli (human type) were cultured from it. The abscess was aspirated twice, and the sinus healed 9 weeks after operation, at which time the patient was allowed up; for 3 weeks there was some difficulty in walking.—While in hospital he had repeated attacks of R. renal colic with macroscopic blood and renal calculi in the urine.

The patient was discharged well on 28.5.48 (4 months after operation).

At re-examination 26.8.48 (3 months after discharge) there were no complaints beyond a sensation of "pulling" in the operation scar, after walking 4-5 km. The sinus had discharged one small drop 4 weeks previously, but had otherwise remained healed.—No abnormal signs were found; the operation scar was soundly healed. The patient was allowed to begin working. Radiography (Fig. 6) showed good calcification, trabecular bone structure, and bony ankylosis above.

Thus, 19 months after the first symptoms of tuberculosis of the sacro-iliac joint, the patient may be considered to be cured, after 6½ months in hospital.

SUMMARY

The literature on the treatment of sacro-iliac osteoarthritis is briefly reviewed. The author reports 13 cases treated by operation; 7 were tuberculous, 5 pyogenic, and 1 a non-specific degenerative arthritis. Abscesses developed in 12 of the cases, and 9 had one or more sinuses before operation.

The pre- and post-operative treatments are described. Special importance is attached to the prophylaxis and effective chemotherapeutic treatment of mixed-infection in cases with sinuses.

The operation used was a partial resection, which is described in outline.

11 patients were cured, 2 died from sepsis at a time when the present antibiotics were not known.

The indications for operation are described.

In conclusion, a typical case is reported.

RESUME

La littérature publiée sur le traitement de l'ostéoarthritis sacro-iliaque est sommairement passée en revue. L'auteur rapporte 13 cas traités chirurgicalement: 7 étaient tuberculeux, 5 pyogènes et 1 arthrite dégénérative non spécifique. Des abcès s'étaient développés dans 12 de ces cas et chez 9 il y avait un ou plusieurs sinus avant l'opération.

Les traitements pré et post-opératoires sont décrits. Une importance spéciale est attachée à la prophylaxie et à un traitement chémotherapeutique efficace des infections mixtes dans les cas avec sinus.

Comme opération on a pratiqué une résection partielle, décrite dans les grandes lignes.

11 malades ont été guéris, 2 sont décédés à la suite d'infections, à une époque où les antibiotiques n'étaient pas encore connus.

Il est donné la description des indications des cas à opérer. En conclusion, un cas typique est rapporté.

ZUSAMMENFASSUNG

Eine kurze Übersicht der Literatur über die Behandlung der sacro-iliakal Osteoarthritis wird gegeben. Der Verfasser berichtet über 13 Fälle, die operativ behandelt wurden. 7 waren tuberkulös 5 pyogen und ein Fall zeigte nicht spezifische degenerative arthritis. Abscesse entstanden in 12 der Fälle, und 9 hatten eine oder mehrere Fisteln vor der Operation.

Die prä und postoperative Behandlung wird beschrieben. Besondere Wichtigkeit wird der Prophylaxe und der wirksamen chemotherapeutischen Behandlung von mischinfizierten Fällen mit Fisteln beigemessen.

Die angewendete Operation war eine teilweise Resektion, welche in grossen Zügen beschrieben wird.

11 Patienten wurden geheilt, 2 starben an Sepsis zu einer Zeit in der die nunmehr verfügbaren Antibiotica noch nicht bekannt waren.

Die Indikationen der Operation werden beschrieben. Zum Schluss wird ein typischer Fall aufgezeigt.

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