

OSTEITIS CONDENSANS ILII AND ITS DIFFERENTIATION FROM ANKYLOSING SPONDYLITIS

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Sicard, Gally, and Haguenu (1926) first described cases of the condition now known as osteitis condensans ilii. The name of the disease was introduced by Bársony and Polgár (1928), who recorded fifteen cases; they considered it to be a specific clinical entity, the lesion being found on radiological examination of the lumbo-sacral area, and the essential feature being dense sclerosis in the iliac bone, adjacent to the lower part of the sacro-iliac joint.

Review of the Literature

Bársony and Polgár (1928) described fifteen cases which they saw within 18 months, an indication that the disease is not rare. All their cases complained of low back pain, and tenderness was noted over the sacro-iliac joints. The lesions could be unilateral or bilateral, and the site of pain coincided with the *x*-ray lesion in unilateral cases. In cases with bilateral involvement the pain was felt diffusely in the lower lumbar region. Some patients also had neuralgic pains in the lower limbs. The disease ran a chronic course, and, although relieved by heat and exercises, tended to relapse. Bársony and Polgár stated that "limited changes" occurred in the joint spaces in some of their cases, and that follow-up *x*-rays were needed to distinguish osteitis condensans ilii from "sacro-iliac arthritis". They offered no firm opinion regarding the aetiology of the condition, but suggested that there might be some disease of the sacro-iliac joint, or that some mechanical strain of the sacro-iliac joints could account for the site of the sclerosis. In a subsequent paper, Polgár (1933) drew attention to the fact that Paget's disease of the ilium could commence in that area of the bone affected by osteitis condensans ilii and simulate the latter condition.

Berent (1933, 1934) described three cases in female patients. He stated that the condition only occurred in women, and that it resulted from damage to the sacro-iliac joints during pregnancy and confinement. The ligaments were relaxed during pregnancy and allowed more movement of the joints. As a result, the ligaments might be stretched or torn, with accompanying periosteal damage.

Pines (1932) described two cases, one of which was a male. Both cases had unilateral disease, and joint tenderness coincided with the site of the lesion.

Rendich and Shapiro (1936) reported twelve cases, three of them in males. While some of their patients had low back pain, sciatica, and tenderness over one or both sacro-iliac joints, others had no symptoms referable to the affected area. These authors cast doubt upon the condition as a cause of low back pain. They stated that the joint outline was normal, and stressed the importance of taking oblique radiographs so as to demonstrate clearly the sacro-iliac joint.

Shafar (1938) reported a case in a male. He stated that the joint spaces were normal in this patient.

Hare and Haggart (1945) recorded their findings in 23 cases. Subsequently, Shipp and Haggart (1950) augmented this account, and reported a total of one hundred cases seen at the Lahey clinic over a period of 13 years. They reviewed all cases seen up to 1946, and, in 29 cases, amended the diagnosis from osteitis condensans ilii to ankylosing spondylitis. All patients in this large series were women; 78 had borne children, and 48 of them dated their symptoms from their pregnancy. The authors considered the sacrum and the sacro-iliac joints to be normal. They advanced the theory that in the female the sacro-iliac joint lies in the sagittal rather than the normal oblique plane, and in pregnancy further strain is put on the articular surfaces owing to relaxation and stretching of the pelvic ligaments. Obesity was a factor in 64 cases. Tests involving movements of the joints did not provoke pain.

Szabados (1947) reported five cases, in three of which there was evidence of a chronic urinary infection; in another two cases a history of pyelitis was obtained. It was considered that the renal and ureteric infection could spread to the nutrient foramina in the iliac bone.

Ude (1950) described six cases in which he also found residual changes of Scheuermann's disease. He suggested that the iliac changes were either secondary sclerosing changes superimposed on an old sacro-iliac epiphysitis, or that the sacro-iliac changes were secondary to the directional strain placed on these joints by variations in the curvature of the spine. In three cases there was an associated degenerative process in the region of

the pelvic symphysis. Subsequently, Ude (1952) reported more than thirty similar cases.

Knutsson (1950) presented the radiological findings in 147 cases of ankylosing spondylitis and in 37 cases of osteitis condensans ilii. In 32 of the patients with condensans ilii, the joint spaces appeared to be normal, and the articular surfaces were unchanged. While indicating that in the early stages of spondylitis it might be difficult to differentiate the changes from those of osteitis condensans, Knutsson felt that such a differentiation could be made at a later stage.

Baker and others (1950), on the other hand, considered that the two conditions were related, and he included six cases of condensans ilii in a series of one hundred cases of ankylosing spondylitis, treated by roentgen therapy. He felt that the conditions were identical because of their identical anatomical situation, clinical symptoms and response to treatment.

Layani and others (1950) reported a single case in a male patient, in whom there was a complicating factor of severe trauma with injury to a hip joint. They obtained a portion of affected bone and examination showed an overgrowth of bone, a periosteal osteophytosis and fibrous periosteal reaction.

Gillespie and Lloyd-Roberts (1953) described 21 cases, all occurring in females who had borne children. They did not consider that the back pain was due to the sacro-iliac lesions, or that the physical findings were related to the radiological appearances. While stressing the incidence of sacral changes, they felt that the probable explanation was an obliterative endarteritis. These authors considered that there was evidence of a prolapsed lumbar disk in thirteen of their cases, and they felt that this was responsible for the pain; in the remaining eight cases the pain was considered to be due to other causes, not elicited.

Hutton (1953) has recently described a series of 28 cases, which included two men. He stated that in 22 cases there was a history of back pain, and in six the condition was discovered accidentally during pyelographic or other radiological examination.

Pathological Changes.—Rendich and Shapiro (1936) obtained a biopsy specimen from one patient who, because of persistent pain, had a sacro-iliac fusion performed. Dr. W. Hala reported on this section as showing marked condensation of the osseous tissue with obliteration of the lacunae. No osteoblasts or osteoclasts were seen. The marrow spaces contained an unusual number of myocytic and plasma cells. There were occasional depositions of lime salts in the condensed bone, occurring more or less parallel to the lamellae of the bone.

Hare and Haggart (1945) studied the findings in two cases from whom biopsy specimens were obtained. The bony trabeculations were greatly increased in density, but the lacunae were still discernible. Scattered islands of cartilage were noted at a considerable distance from the joint surface. The bone marrow showed focal areas of fibrosis. There was osteoblastic activity in excess of the normal in the form of clumps of osteoblasts and occa-

sional osteoclasts. Macroscopically the articular cartilage was fibrillated and irregular.

Gillespie and Lloyd-Roberts (1953) obtained a biopsy specimen from a patient with marked bilateral condensans ilii, in whom the sacro-iliac joints appeared radiologically to be normal. Prof. S. L. Baker reported that the articular cartilage and ligaments were normal, and the main findings in the bone were of concentric osseous deposits, thickened lamellae and narrow Haversian canals.

Radiological Appearances.—These have been described in detail by several authors, notably Bársony and Polgár (1928), Knutsson (1950), and Gillespie and Lloyd-Roberts (1953). There is a disturbance of the normal architecture of that part of the iliac bone which lies in proximity to the sacro-iliac joint. The characteristic lesion is a uniform area of dense sclerosis, approximately triangular or aliform in shape, the base of which lies on the iliac border of the sacro-iliac joint. The apex of the lesion spreads into the auricular portion of the ilium to a variable degree. The smallest lesion merely occupies the angle at the lower end of the sacro-iliac joint, but sometimes a large lesion is seen extending through the ilium towards the pubic ramus, the base of the lesion occupying the entire iliac border of the sacro-iliac joint. The condition is bilateral in the majority of cases.

The outer margin of the sclerosis often presents a well-defined edge if the film has been over-exposed. Close examination shows, however, that there is a gradual transition from the dense opacity of the lesion to the zone of completely normal bone. In some cases the lateral margin of the lesion is grossly irregular.

Although the sclerosis appears to be very dense and of uniform consistency, it has been noted that the cancellous structure of the bone has been preserved. This is more evident if the film has been slightly over-exposed.

Sclerotic changes are seen in the sacrum in a small proportion of cases. Since Bársony and Polgár first reported this feature, several other workers have commented upon its occurrence, especially Rendich and Shapiro (1946) and Gillespie and Roberts (1953). Because of the oblique position of the sacro-iliac joint, it is impossible to say on the study of the antero-posterior film alone whether the sacrum and sacro-iliac joint are affected. Oblique views of the sacro-iliac joints and tomographs will establish the true location of the changes. Tomography has been used to prove that the lesion extends to a depth of several centimetres into the bony substance.

Thus far all authorities are agreed, but there is a considerable amount of controversy regarding the question of alterations in the margins of the sacro-iliac joint. Bársony and Polgár (1928) reported limited changes in the sacro-iliac joints in some of their cases, and that serial x rays were required to distinguish osteitis condensans ilii from "sacro-iliac arthritis". These authors were probably referring to the sacro-iliitis seen in ankylosing spondylitis, as the significance of this finding was not fully appreciated until Scott (1942) stressed the initial involvement of the sacro-iliacs in spondylitis. Pines

(1932) considered that his second patient, a female, might have a sacro-iliitis. Ude (1950) mentioned that in one of his cases, that of a female patient with unilateral disease, there was narrowing of the sacro-iliac joint adjacent to the affected bone. Knutsson (1950) reported narrowed joint spaces and lip shaped protrusions from the edges of the articular margins in some of his cases, and stated that, although the distinction between osteitis condensans ilii and ankylosing spondylitis was easy in the majority of cases, there were border-line cases, with insignificantly developed sclerosis on the iliac margin and seemingly intact joint spaces, in which initially it was impossible to make a differential diagnosis.

Rendich and Shapiro (1936), Hare and Haggart (1945), and Gillespie and Roberts (1935) all maintained that the sacro-iliac joints are not affected in osteitis condensans ilii. All these authors studied the sacro-iliac joints by oblique radiographs and tomograms.

Other radiological findings reported in cases of osteitis condensans ilii have been

- (a) changes in the pubic symphysis with sclerosis and small cystic spaces (Ude, 1950; Gillespie and Roberts, 1953);
- (b) Garre's sclerosing osteitis (Szabados, 1947);
- (c) evidence of old spinal osteochondritis (Ude, 1950);
- (d) bony islets in other regions of the skeleton, reported in occasional cases.

Present Study

Material.—In view of the many divergent opinions regarding osteitis condensans ilii, especially with regard to its significance, clinical features, aetiology, and radiological appearances, a further series of twenty cases is here presented. All twenty cases had an initial x ray which suggested the diagnosis of osteitis condensans ilii. The patients have been investigated since July, 1950. In each case a full clinical, radiological, and haematological investigation was performed; the serum calcium, phosphorus, and alkaline phosphatase were measured; the Wassermann reaction was tested. An intravenous pyelogram was performed in five cases in which there was a history indicative of a previous urinary infection. Five of the patients were admitted to hospital, and the remainder were investigated at the Out-patient Department.

Results

Symptoms.—All the patients in the series were females, and all had a complaint of low back pain. Their ages ranged from 26 to 47 years (mean 35.1). The duration of symptoms ranged from 2 to 14 years (mean 7.05). The age at onset varied from 18 to 41 years (average 28).

The onset of the pain occurred during pregnancy or in the puerperium in eleven cases. Two patients

had had children since the onset of their symptoms without any increase in symptoms or any relapse. Three patients stated that successive pregnancies increased the pain. Five of the patients were nulliparous.

The back pain was felt in the lumbo-sacral area, usually most marked just to one or other side of the midline. In eighteen of the cases (90 per cent.) pain radiated to one or other hip, or beyond. In nine cases there was bilateral sciatic radiation.

The pain was usually described as dull, persistent, and "nagging" in character. Sudden movements, and any physical activity involving the lumbo-sacral area, aggravated the pain. Coughing, sneezing, and straining at micturition or at stool, did not usually cause increased discomfort. With only one exception, the patients remarked that the pain was aggravated at the time of the menstrual periods, and in several cases the symptoms had been originally attributed to dysmenorrhoea.

All the patients experienced periods of complete or partial remission, which varied from a few weeks to 3 years; the attacks of pain lasted from 2 weeks up to 5 months, and five patients stated that they were never completely free from some discomfort. Three patients gave a definite history of a flexion injury in the back, consistent with a prolapsed lumbar intervertebral disk lesion. In only two patients was any history given of a near relative affected by low back pain. X rays of these relatives did not reveal any abnormality in the sacro-iliac region.

Eleven patients complained of marked stiffness of the spine in the mornings; this stiffness gradually wore off as the day progressed.

Physical Features.—The principal physical findings on examination of the spine are shown in Table I. No constant associated abnormalities or physical defects were noted, the principal complicating dis-

TABLE I
PRINCIPAL PHYSICAL FINDINGS ON SPINAL
EXAMINATION OF TWENTY CASES OF
"OSTEITIS CONDENSANS ILII"

Physical Sign	No. of Cases
Tenderness over Sacro-Iliac Joints	17
Spinal Deformity	4
Restricted Spinal Movements { all movements .. 5 } extension and flexion .. 3 } 13 flexion .. 1 extension .. 4	
Positive Straight-Leg Test	2
Pain on Movement of Sacro-Iliac Joints	16
Obesity	5

TABLE II
RADIOLOGICAL CHANGES IN TWENTY FEMALES INITIALLY DIAGNOSED AS CASES OF
OSTEITIS CONDENSANS ILII

Case No.	Age (yrs)	Sacrum Involved	Sacro-Iliac Joint	Spine	Other Changes
1	40	0	Spaces normal Lipping at lower margin, right side	Slight sclerosis L5 region	Opaque maxillary sinuses
2	36	+	Narrowed space Lipping of right joint	Mild osteo-arthritis changes ? osteochondritis	Slight irregularity of manubrio-sternal joint
3	34	0	Normal	Minor osteo-arthritis of thoracic spine Narrow L4/5 space	—
4	47	0	A little lipping at lower margins	Minor osteo-arthritis of C5/6	Cystic changes in pubis
5	34	0	Normal	Schmorl's node in T7	—
6	40	+	Lipping at lower margin of right joint	—	—
7	36	0	Narrowing of lower part of joint spaces	—	—
8	43	0	Lipping at lower margin	Mild osteo-arthritis in thoracic and LV5 regions	Slight irregularity in manubrio-sternal joint surfaces
9	31	0	Normal	—	—
10	35	0	Normal	Schmorl's node in LV3	—
11	30	+	Narrowing of joint spaces in inferior parts	Narrowed LV5/S1 joint space	—
12	26	+	Narrowing of joint spaces with minor irregularity	Mild changes of osteochondritis in thoracic spine	Healed T.B. focus in lung
13	44	0	Lipping at lower margin	Gross kypho-scoliosis	Left renal calculus
14	30	0	Minor sclerosis and erosion Sub-marginal osteoporosis	—	Iritis Erythrocyte sedimentation rate raised Increasing limitation of spinal movements
15	30	0	Minor erosions along iliac border of right joint	—	Slight erosion of manubrio-sternal joint Erythrocyte sedimentation rate raised
16	35	+	Irregular widening, erosion, and osteoporosis	Failure of fusion of a few epiphyses	—
17	30	+	Marginal erosions	? involvement of apophyseal joints	Cystic changes in pubis Manubrio-sternal joint ankylosed Erythrocyte sedimentation rate raised
18	33	0	Irregular joint space right side	? squaring of lumbar vertebrae	—
19	27	+	Patchy erosions and widening	—	Increasing limitation of spinal movements Erythrocyte sedimentation rate raised
20	42	+	Irregular widening and erosions	? squaring of lumbar vertebrae	Mitral cardiac lesion Calcaneal spurs

Cases 1-13: Osteitis condensans ilii (mean age 36.6 yrs)
Cases 14-20: Ankylosing spondylitis (mean age 32.4 yrs)

orders being mild obesity (five cases), and maxillary sinusitis, mitral stenosis, healed pulmonary tuberculous focus (one case), cervicitis and iritis (one case), and renal calculus and pyelonephritis (one case).

Radiological Examination.—The radiological changes in the present series are shown in Table II. They are recorded in detail because of the conflicting descriptions that have been given by various authorities in the past. The illustrations also

provide evidence of the range of changes that may be seen (Figs 1-8).

The condition was bilateral in all but two cases, and the lesions varied considerably in size (Figs 1 and 2). The margin of the lesion was usually fairly distinct and even, but occasionally irregular. The sacrum was involved in seven cases, a feature that was demonstrated by means of an oblique radiograph of the sacro-iliac joints (Fig. 4).

Detailed study of the radiological features elicited some points of interest. All the cases in this series were initially considered to be cases of osteitis

condensans ilii, inasmuch as the posterior-anterior radiograph of the pelvis showed dense sclerosis in the lower iliac region of the sacro-iliac joint, with an apparently normal joint outline. In seven cases, however, oblique views of the sacro-iliac joints showed minimal but definite abnormalities of the joint margins in the inferior cartilaginous region of the joint (Cases 14-20, Table II). These changes consisted in erosions of the joint margin with patchy areas of submarginal osteoporosis, and some resulting patchy, irregular widening of the joint space (Fig. 8). They were interpreted as indicating

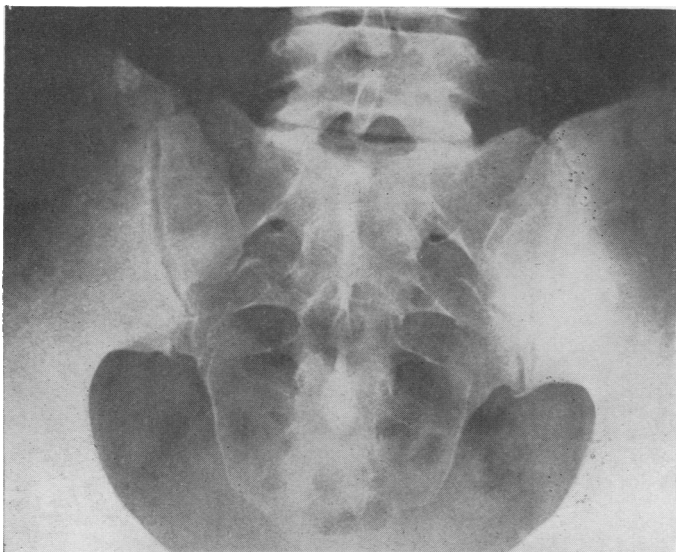


Fig. 1.—Case 2, female aged 33 years, osteitis condensans ilii, lesion restricted to left ilium.

Fig. 2.—Case 5, female aged 32 years, osteitis condensans ilii, marked bilateral lesions.





Fig. 3.—Case 3, female aged 36 years, bilateral osteitis condensans ilii, with predominant changes in right ilium.

destruction of the cartilage, an osteoclastic process. These seven patients were considered to be cases of ankylosing spondylitis.

Further consideration and study of the clinical course of these seven cases has lent support to this view. Thus, in four cases, the erythrocyte sedimentation rate has intermittently become raised. One patient developed iritis, one had calcaneal spurs, and two patients developed progressive limitation of spinal movements compatible with ankylosing spondylitis. All these seven patients have had rest, physiotherapy, and the usual conservative treatment for low back pain—without any relief. Four have since had radiotherapy with benefit; the other three patients have deferred treatment. These seven patients all had a complaint of marked morning stiffness, and all had bilateral lesions. In no instance in this group was there any other lesion present which could be held to account for the low back pain.

In the remaining thirteen cases, classed as osteitis condensans ilii, there are four cases in which the differentiation from ankylosing spondylitis has proved difficult. However, in these thirteen cases, the sacro-iliac joint spaces have shown no abnormality, apart from slight narrowing, minimal irregularity or lipping. In the osteitis condensans ilii group, the symptoms have been milder, periods of prolonged remission commoner, and response to conservative methods of treatment better, than in the spondylitis group. The erythrocyte sedimentation rate has remained within normal limits, there have been no signs of any systemic disturbance, and

no progression in the limitation of joint movement. Morning stiffness was not a marked feature in the patients with osteitis condensans ilii, except in those patients who had concurrent osteoarthritic changes. The principal differences between the groups are shown in Table III (opposite).

The x-ray changes were unilateral in two cases (Fig. 1), and predominantly unilateral in four other cases (Fig. 4). There was a correlation between the site of the lesion (as shown on x ray), the site of the pain, and the localization of the sacro-iliac tenderness and pain. In no instance did the patient localize the pain over a normal joint. In two cases the principal symptoms were referred to the less grossly affected ilium (as judged radiologically). In several cases



Fig. 4.—Case 3, oblique radiograph of right sacro-iliac joint, showing narrowed joint space in inferior region. Marked sclerosis is seen in the iliac bone, and a little sclerosis involving the sacrum.

a grossly involved region was not tender or painful on movement.

X rays of the remainder of the spinal column and long bones did not reveal any constant abnormality. The findings are listed in Table II.

Differential Diagnosis.—The differentiation

TABLE III
COMPARISON BETWEEN FEATURES OF OSTEITIS CONDENSANS ILII
AND EARLY CASES OF ANKYLOSING SPONDYLITIS

Diagnosis	Ankylosing spondylitis	Osteitis condensans ilii
Sex Incidence	Predominantly male	Predominantly female
Relation to Pregnancy	Not usual	Very common
Symptoms	Stiffness and pain	Pain more than stiffness
Signs	Some restriction of spinal movement often present	Restriction of spinal movements not a marked feature
Lesions	Bilateral	May be unilateral
X-ray Appearances	Patchy sclerosis with osteoporosis, and irregular widening of joint spaces	Sclerotic lesion, mainly in iliac bone, with relatively normal joint spaces
Systemic Disturbance (e.g., loss of weight, anaemia, raised erythrocyte sedimentation rate)	May be present	Absent
Complications (e.g., iritis, calcaneal spurs)	May be present	Absent



Fig. 5.—Case 14, female aged 31 years, radiograph taken in 1945 considered to be osteitis condensans ilii.

Fig. 6.—Case 14, radiograph taken in 1951, showing no substantial change from that taken 6 years previously. Although initially considered to be suffering from osteitis condensans ilii, this patient developed iritis and an intermittently raised E.S.R. in 1952, indicating a diagnosis of ankylosing spondylitis.



formans), osteo-arthritis, and osteoplastic secondary deposits. However, the clinical features of these diseases, and close attention to the radiological appearances, should suffice to identify them.

Prognosis.—Osteitis condensans ilii runs a chronic course, but remissions are common and the response to treatment is usually good. The lesion usually shows little or no change over a period of years, although Shipp and Haggart (1950) found evidence of regression in (everal of their cases. In the present

between osteitis condensans ilii and ankylosing spondylitis is the major issue, and the points of differentiation have already been considered in detail. Other sacro-iliac lesions which might cause difficulty in diagnosis are tuberculosis, Paget's disease (osteitis de-

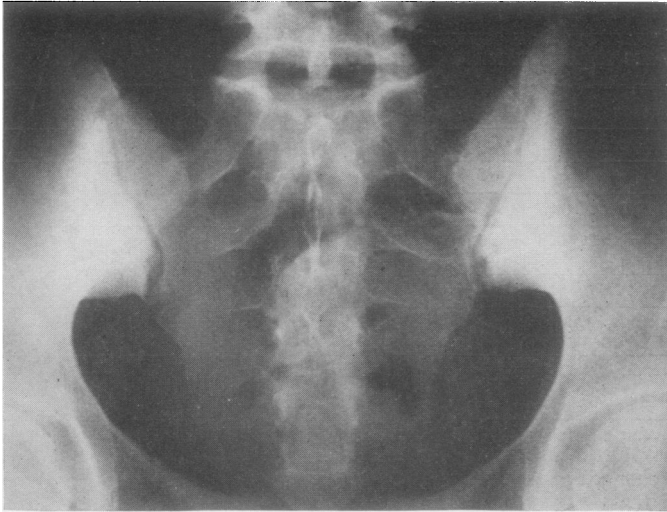


Fig. 7.—Case 19, female aged 27 years, with ankylosing spondylitis, radiograph of pelvis suggestive of osteitis condensans ilii. Sacroiliac joints apparently normal.

Fig. 8.—Case 19, oblique radiograph of left sacro-iliac joint, showing submarginal osteoporosis, erosion of the iliac surface, and irregular widening of the joint space. Similar changes were found in the right sacro-iliac joint. Subsequent elevation of the E.S.R. and restricted spinal movements supported the diagnosis of ankylosing spondylitis.

series, no such evidence was obtained, although serial radiographs extending over 3 years were studied in most of the cases, and in two cases films were obtained dating back to 1945.

Treatment.—The majority of patients obtained substantial benefit from a simple conservative regime of treatment. This included:

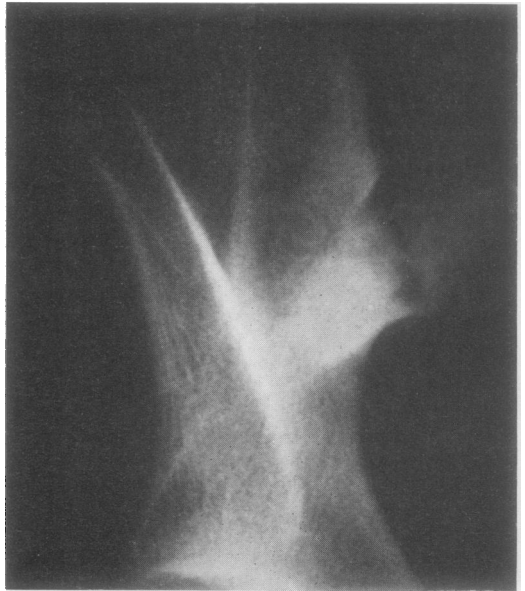
- (a) rest on a firm mattress;
- (b) local application of heat by an electric pad or radiant heat lamp, and short-wave diathermy to the tender areas;
- (c) spinal exercises to correct faulty posture;
- (d) correction of obesity by dietetic measures when indicated;
- (e) instruction in the avoidance of flexion strains to the spine, heavy lifting, and jarring movements;
- (f) daily maintenance dose of analgesics adequate to control symptoms;
- (g) spinal support to control symptoms (four patients).

Of thirteen patients, nine obtained substantial relief by the above regime, and one further patient had a remission in the early stages of treatment without any subsequent relapse. In one further case, complicated by gross congenital spinal deformity and renal calculus, it was not possible to give the full course of treatment or to assess the results. Only two patients failed to gain substantial benefit,

but they have since improved and have had prolonged remissions.

Baker (1950) treated six cases by deep x-ray therapy to the sacro-iliac regions, and reported a good response. Although the risks of this therapy are slight (White, 1953), it is felt that it should be reserved for those cases that fail to respond to the conservative regime. In the present series, only one patient received deep x-ray therapy, and she relapsed after 6 months relief of symptoms.

Arthrodesis of the sacro-iliacs has been reported in a few cases (Rendich and Shapiro, 1936; Shipp and Haggart, 1950). Again, it is felt that this rather formidable surgical undertaking should be considered only for severe and



intractable cases. It is difficult to understand how this operation should be successful in a condition in which the joint surfaces are virtually intact.

Discussion

Nomenclature.—The term osteitis condensans ilii has, by general usage, become accepted, although there is little to commend it. There is no clinical or pathological evidence of any inflammation, and the changes are not always restricted to the ilium. For these reasons the condition is often referred to as

“condensans ilii” or “osteitis condensans”. At present the most suitable descriptive term would be sacro-iliac osteosclerosis, but until the pathogenesis of the condition is understood, the time-honoured designation of osteitis condensans ilii must suffice.

Aetiology.—The aetiology of osteitis condensans ilii is still unknown. The present series of cases lent no support to the theories that have involved trauma (Shafar, 1938; Layani and others, 1951); juvenile epiphysitis and a possible relationship to Scheuermann's disease (Ude, 1950, 1952); or chronic urinary infection (Szabados, 1947). No patient in the present series gave any history of trauma, and in only one case was infection of the urinary tract present. Minor changes, possibly indicative of mild vertebral epiphysitis, were seen in two cases, and Schmorl's nodes were noted in a further two patients (Table II). Many other investigators have failed to establish any relationship between osteitis condensans ilii and Scheuermann's disease.

The striking sex incidence of the disease and its common relationship to pregnancy (in nine cases out of thirteen in the present series), have led to several related theories concerning the aetiology and pathogenesis. Thus Berent (1934) considered strains during pregnancy and parturition led to ligamentous, capsular, and periosteal damage, but this theory has been invalidated by the finding, at operations, that the ligamentous and extra-articular structures were normal (Shipp and Haggart, 1950; Gillespie and Lloyd-Roberts, 1953).

Relaxation of the pelvic ligaments during pregnancy would allow more movements at the sacro-iliac joints, especially in view of the fact that the gynaecoid pelvis is more obliquely set than the android, and the stabilizing ridges on the iliac joint surface are usually less prominent in women than in men (Shipp and Haggart, 1950). The absence of cartilaginous destruction and the comparative infrequency of sacral changes are factors which weaken this theory.

Another theory has invoked the pelvic obliterative endarteritis that follows parturition as a causative agent. An extension of this process to involve the nutrient artery supplying the affected region of the ilium could lead to ischaemic changes in the bone. Rendich and Shapiro (1936) have drawn attention to the constant position of a nutrient artery in the inferior juxta-articular region of the ilium, and this would account for the characteristic situation of the lesion. The grosser lesions would be accounted for by involvement of smaller vessels in the middle and superior regions of the joint. Support to this

theory is given by the histological studies of affected bone (Rendich and Shapiro, 1936; Shipp and Haggart, 1950; Gillespie and Lloyd-Roberts, 1953). The histological appearances are those of a non-inflammatory calcium condensation, and are in keeping with an ischaemic process. Serious objections to the theory of pelvic endarteritis obliterans are the occurrence of cases in males and nulliparous females, and the absence of changes in other regions of the pelvis, *e.g.* the pubic articulations.

Ankylosing Spondylitis.—The clinical and radiological findings in the group of seven cases suggest that there is a restricted or abortive type of spondylitis which occurs especially in women. The symptoms are restricted to the lower lumbar area; the signs are minimal; the constitutional disturbance is negligible; the radiological evidence is predominantly that of sclerosis of the iliac bone adjacent to the sacro-iliac joint (Figs 5-8), with only slight evidence of the erosion and destruction seen in the more flagrant forms of the disease. The existence of this group accords with the experience of Tyson and others (1935) who stressed that spondylitis runs a milder course in women. Another investigator, White (1953), recently presented a series of one hundred cases of spondylitis in women, and stated that one-third had a normal erythrocyte sedimentation rate.

The existence of this group is of considerable interest, inasmuch as more widespread recognition of such cases would significantly alter the accepted sex ratio of the disease. Patients in this category should be offered deep x-ray therapy, as the disease may be more active. If they are not anxious to have therapy at this stage, they must be kept under periodic review.

It is possible that abortive or restricted cases are commoner than is thought, so that some of the credit claimed for radiotherapy in limiting the disease process, may be mainly due to the natural course of the disease.

Osteitis Condensans Ilii.—In the remaining thirteen cases, the diagnosis of osteitis condensans has been sustained. The lesions may be unilateral or bilateral, and there may be involvement of the sacrum. The joint spaces are usually normal; occasionally some slight narrowing and lipping at the lower margin may be seen, or some minimal irregularity. The patients have long remissions, and, although the onset may be related to a pregnancy, a subsequent pregnancy does not necessarily aggravate the symptoms. The erythrocyte sedimentation rate is within normal limits, there is no

associated systemic disturbance, and there are no consistent collateral findings on physical or radiological examination.

It is considered that osteitis condensans ilii is a specific clinical entity, occurring in women in over 90 per cent. of cases, often related to a pregnancy, and accompanied by low back pain. In no instance, in this series, could the condition be termed an incidental radiological finding. Although alternative causes for the back pain have been indicated by some authors, in only three patients out of the thirteen in this series was such an alternative explanation convincing.

Summary

A review of the condition known as osteitis condensans ilii is presented, and a further thirteen cases are described. It is considered that the condition is a specific pathological entity which can cause low back pain.

The differential diagnosis of osteitis condensans ilii is considered, with special reference to ankylosing spondylitis.

Seven cases initially diagnosed as osteitis condensans ilii, have now been recognized as examples of ankylosing spondylitis. These represent a restricted or abortive type of spondylitis, more common in women than in men.

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Ostéite condensante iliaque et sa différenciation de la spondylarthrite ankylosante

RÉSUMÉ

On passe en revue l'affection connue sous le nom d'ostéite condensante iliaque et on en décrit treize autres cas. On considère que cette affection est une entité pathologique spécifique capable de provoquer une douleur lombaire.

On considère le diagnostic différentiel de l'ostéite condensante iliaque, surtout par rapport à la spondylarthrite ankylosante.

Sept cas, diagnostiqués au début comme ostéite condensante iliaque sont reconnus maintenant comme ceux de spondylarthrite ankylosante. Ils représentent un type de spondylite limitée ou abortive, plus fréquente chez les femmes.

Osteitis condensans ilii y su diferenciación de la espondilartritis anquilosante

SUMARIO

Se pasa en revista la afeción conocida como osteitis condensans ilii y se describe trece casos más. Se considera que esta afeción es una entidad patológica específica que puede causar un dolor lumbar.

Se considera el diagnóstico diferencial de la osteitis condensans ilii, particularmente respecto a la espondilartritis anquilosante.

Siete casos, inicialmente diagnosticados como osteitis condensans ilii, fueron luego reconocidos como ejemplos de espondilartritis anquilosante. Estos representan un tipo de espondilartritis limitada o abortiva, más común en mujeres.