

SUPPURATIVE ARTHRITIS OF THE SACRO-ILIAC JOINT

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SUPPURATION of the sacro-iliac joint is a clinical entity which occurs more frequently than is commonly believed. If this condition is kept in mind by the physician when an acute lesion of obscure etiology is encountered in the lumbar or gluteal regions with unilateral lower abdominal symptoms, the diagnosis would be made at a more favorable phase of the disease, with consequent earlier appropriate drainage and a better prognosis, as the mortality rate in this lesion is relatively high even if recognized early.

This disease is only occasionally mentioned in text-books on surgery, and then by name only; no adequate description of the condition was found. Jones and Lovett do not mention the sacro-iliac joint in discussing pyogenic infections of joints, nor does Campbell in his description of acute affections of joints. The fact that the prognosis is bad is mentioned,^{2, 6, 7} but no statistics are given. Such opinions regarding prognosis are probably based upon studies of tuberculosis of the sacro-iliac joint,⁹ a subject which has been thoroughly studied, and about which the literature is quite voluminous. Only a few articles in English on suppurative arthritis of the sacro-iliac joints could be found under that title. Poore¹¹ wrote an excellent article on this subject in 1878, and reported two cases of his own and collected 56 cases from the literature, mainly French. A number of articles were found under the title of "Psoitis."^{4, 6, 14, 15} The clinical picture described in these corresponded almost exactly with that found in our cases, leading us to believe that they were true suppurations of the sacro-iliac joint, but that only the secondary psoas abscesses were recognized. Young¹⁶ reported what was probably a true primary pyogenic infection of the sacro-iliac joint. The patient was treated by incision but the technic of the operation was not described.

During the past three years five cases have been diagnosed and treated by the author. Six other cases have been seen either in consultation or by courtesy of other surgeons. The first five cases are reported in some detail. Of that number, two have died, two are well, and one healed but is now again in the hospital with an acute exacerbation of osteomyelitis of the pelvis. After studying this group carefully we now feel that certain errors can be avoided, enabling one to make the diagnosis more readily and treat the lesion more efficiently.

Pathologic Anatomy.—Clarke⁴ gives an excellent description of the pathology in this lesion. His postmortem findings were somewhat similar to those found in Case 3 of our series, upon whom an autopsy was performed.

The disease may start within the joint itself, in the ilium, or sacrum adjacent to the joint. It would seem to be secondary to a blood stream infec-

tion, in as much as the clinical course is similar to pyogenic arthritis in other joints. In one instance in the series (Case 3), the primary focus was probably in the ilium, between the posterior superior and inferior spines, so that this case may possibly be considered as an acute arthritis complicating osteomyelitis of the ilium. In the other four instances no definite site could be precisely determined, but the symptoms were well localized over the sacro-iliac joint and in the iliac fossa of the abdomen in all five cases. At operation no free pus was found until the pelvic cavity was entered, in Cases 1, 2 and 4. In Case 3 no free pus was found although culture was positive from a suspicious looking area in the ilium, before entering the joint. It is difficult to state whether this represented the original focus of infection, or whether the disease had extended to this spot from the joint. Case 5 was not operated upon and autopsy was refused. All these patients had abdominal symptoms early in the disease. All roentgenologic evidence pointed to pathology in the sacro-iliac joint, even in Case 3. There was no evidence of osteomyelitis of the ilium or sacrum except at the joint surfaces before operation. Of course, they developed osteomyelitis of the ilium, sacrum, ischium, or all of them, later. For these reasons, we believe that these patients had a primary infection of the sacro-iliac joint rather than a secondary pyogenic arthritis following osteomyelitis of the ilium or other pelvic bones. Thus, they may be considered as primary acute pyogenic arthritides.

As soon as the sacro-iliac joint is involved, the pus under pressure, following the path of least resistance, quickly breaks through the anterior sacro-iliac ligament, which is very thin and easily ruptured.¹³ Sashin says that "the anterior sacro-iliac ligament is a thin, rather weak structure," and, "upon slight pubic separation it is stretched and very often tears."

What paths may the pus follow? Passing through this aperture, the pus from the joint burrows under the iliacus muscle and fills the iliac fossa. When this fossa is filled, the pus may take one of several courses:

(1) It may follow the tendon of the iliopsoas muscle, in which event it will become superficial on the inner aspect of the thigh.

(2) If at Poupart's ligament, instead of following the iliopsoas, it follows the pectineus muscle in cases with necrosis of intervening tissues, it will become superficial on the posterior aspect of the thigh.

(3) It may enter the hip joint through a bursa which is found between the iliopsoas tendon and the anterior part of the capsule of the joint, if the bursa communicates with the joint, as it sometimes does. One in this series took this pathway (Case 3).

(4) Should it follow the tendon of the obturator internus, which passes out of the pelvis through the lesser sacrosiatic foramen, the abscess will point behind the hip joint.

(5) If the pathway be along the course of the pyriformis muscle, which passes through the greater sacrosiatic foramen, a low gluteal abscess occurs.

(6) Should its course be upward from the iliac fossa into the lumbar region, a lumbar abscess forms.

(7) The pus may travel anteriorly and upward towards the crest of the ilium and break through anteriorly onto the abdominal wall.

When muscle planes have broken down, the pus follows very unorthodox pathways. The author has observed a penetration of the pelvic floor and discharge through the vagina in a tuberculous lesion of the sacro-iliac joint, and in one case of this series the rectal wall was eroded, and a rectal fistula produced. Goldman⁵ reports a case of blind internal fistula with arthritis of the sacro-iliac joint. It is hard to determine from the report which was the primary lesion.

The osteomyelitic process in the ilium may be sufficiently widespread to break through the dome of the acetabulum and produce a secondary suppurative arthritis of the hip joint. This occurred in one instance, while in another the ilium was broken through, and the pus followed the fascial planes of the gluteal muscles and traveled down to the outer side of the thigh.

Symptoms and Physical Signs.—The onset is similar to an acute osteomyelitis in any of the long bones. The temperature may vary from 100° to 104° F., and be preceded by chills. The systemic symptoms vary with the virulence of the infection. Pain cannot be localized very definitely. Patients are apt to point to the buttocks and hip of the affected side, but nearly all complain of pain in either the lower right or left abdominal quadrant, depending on whether the right or left sacro-iliac joint is affected. One patient had persistent vomiting for several days, which was very suggestive of intestinal obstruction. It is the abdominal symptoms that are misleading, and often confusing, in making an early diagnosis. These patients appear very acutely ill. Upon examination some flexion of the hip on the affected side is noted. Flexion of the hip with the knees extended causes severe pain, and is markedly restricted, due to the action of the biceps and semitendinosus muscles which produce motion in the sacro-iliac joint through their pull on the ischium. Extension is restricted, due to the spasm of the iliopsoas muscle. Rotation of the body is extremely painful. This is due to the hinge-like motion on a transverse axis in the sacro-iliac joint, producing an opening and closing movement of the affected joint. Pressure elicits a definite, tender, painful spot directly over the surface projection of the sacro-iliac joint. If the pus has broken through anteriorly, which occurred in all the cases, a definite mass is palpable in the iliac fossa over the lower lateral aspect of the abdomen, as well as by rectal or vaginal examination. There is a fulness in the upper thigh, inguinal region, lateral and posterior aspects of the hip joint, and gross swelling and edema of the entire thigh has been observed. In some instances the swelling has been due entirely to edema, and in others to extravasation of pus in the fascial planes. Edematous swelling always precedes suppuration. It would seem that the edema is due to pressure on the iliac vessels after pus has accumulated in the iliac fossa. Due to the early involvement of the iliopectineal bursa, confusion of this lesion with disease of the hip joint arises. One patient developed a foot drop which persisted until death. This could not be explained except by pressure on the lumbosacral plexus. Later on in

the course of the disease, due either to improper drainage or to the virulence of the infection, the hip joint may become involved, and then the physical signs of suppurative arthritis of the hip joint are present; that is, restriction of all motions, and increased flexion deformity. Depending upon which sacro-iliac is involved, pressure over the lower lateral abdominal quadrants will produce pain on the side of the sacro-iliac joint that is affected.

Diagnosis.—The diagnosis is by no means easy to make, but the keeping in mind of the possibility of this lesion is the first criterion for its more frequent recognition. The initial symptom is pain, gradually increasing in severity, and definitely localized over the sacro-iliac joint. Torsion movements of the trunk provoke excruciating pain, so that considerable reliance should be placed on the difficulty experienced by the patient in turning from side to side even while lying in bed. This is so, particularly before the pus ruptures into the pelvis. This clinical picture, plus such objective signs as a mass in the iliac fossa, palpable either through the abdomen, vagina, or rectum; swelling of the upper thigh, especially under the iliopsoas tendon; fever ranging from 102° to 104° F.; a rapid pulse; a high leukocytosis with a high polymorphonuclear count; and a negative roentgenogram, should render the diagnosis possible. If the patient is not seen until the second or third week, roentgenologic examination will be of definite help, for by that time some destruction is usually demonstrable in either the iliac or sacral portions of the articulation.

Tuberculosis of the lumbar spine complicated by a psoas abscess is easily differentiated. It seems sufficient to mention such differences as the positive roentgenographic evidence of the vertebral lesion, the gradual onset, and the history of the protracted illness in tuberculosis.

It must be also differentiated from appendicitis, as the general symptoms may be the same in both lesions. However, the physical signs are different. In appendicitis, pain is usually localized in the right lower quadrant, but there is no swelling of the upper thigh, and rotation of the trunk does not produce excruciating pain, nor is there pain on pressure over the sacro-iliac joint.

Osteomyelitis of the neck of the femur may simulate sacro-iliac osteomyelitis at the onset, but in the former the physical signs are limited to the hip; they are: restriction of motion in all directions, spasm of all hip muscles, no tenderness over the sacro-iliac joint, and no mass in the iliac fossa. There is a greater degree of hip flexion deformity in osteomyelitis of the femoral neck than in sacro-iliac disease, and rotation of the trunk does not produce pain if the affected hip is steadied firmly during the maneuver. The first case in this series was mistaken for a hip joint lesion.

Prognosis.—The prognosis at best is very poor. It depends essentially on the virulence of the organism; the resistance of the patient; and the adequacy of the drainage. An early diagnosis with proper drainage affords the best outlook. The age of the patient is a factor; the older they are, the less favorable the outcome. If diagnosed and drained very early, the mortality rate

should not be greater than that of pyogenic arthritis of any other joint in the body, but the difficulty lies in the remoteness of the focus from the obvious objective abdominal signs and symptoms. The usual treatment so far has been the drainage of the secondary abscesses, rather than the primary joint lesion. This affects the prognosis unfavorably by increasing the morbidity. Another factor is the ease with which complications may be overlooked, due to the difficulties of making a thorough examination during the early part of the illness. Pain is so acute that movement is almost impossible. In this series, a hip infection was unrecognized in one instance, and in another, a lumbar abscess was undiagnosed, largely because of fixed decubitis and resistance to movement. The lumbar abscess was found at autopsy, accompanied by necrosis of practically all soft tissues up to the first lumbar vertebra on the affected side. If this had been discovered in time, and proper drainage provided, the patient might have survived, although this is questionable as there was a very virulent blood stream infection.

Complications.—The principal complications are the result of abscesses forming in the various locations previously mentioned. In the severe infections the muscles in the path of the pus are completely destroyed, as shown in the postmortem examination of Case 3. The hip joint may be involved, either by extension forward of the osteomyelitic process within the ilium, or through the iliopectineal bursa. Osteomyelitis of the adjacent bones always follows.

Treatment.—As has been mentioned before, drainage of secondary abscesses has been the routine surgical procedure up to the present time, although as long ago as 1889 Gongolpre⁶ described a method of draining the iliac cavity by trephining the pelvis. In 1899 Bardenheuer¹ described the essentially proper approach for radical operations in tuberculous infections of the sacro-iliac joint; Picque¹⁰ in 1909 and Chandler³ in 1933 have done likewise.

The approach used in each instance in this series was similar to that described by Chandler,³ who drained the sacro-iliac joint for pneumococcic infection, although we were not familiar with his method until after operating on the first case. The basic principle in any approach is to provide dependent drainage from behind through the ilium.

The operation consists of an exposure of the posteromedian aspect of the ilium through a skin incision along the posterior half of the iliac crest downward to the posterior inferior spine. The gluteus maximus and medius muscles are then resected subperiosteally, sufficiently lateral to expose that part of the ilium which lies directly over the sacro-iliac joint. The joint is exposed through a large window by the resection of a block of bone from the posterior aspect of the ilium lying over the sacro-iliac joint. That part of the sacrum which goes to form the joint with the ilium is removed. This permits the admission of at least one or two fingers into the pelvis. The iliacus muscle is felt, and lifted from behind. Free pus is usually not found until the pelvic cavity is entered. The wound is packed with vaseline gauze

and left wide open. A plaster of paris spica is applied if the patient's condition permits. If not, a Buck's extension is used until such time as a plaster spica can be applied. The wounds are dressed as infrequently as possible, preferably not for two or three weeks, unless a rise in temperature indicates inadequate drainage, or signs of hemorrhage appear. We have never had to remove the packing because of hemorrhage, not having encountered this complication as yet. If secondary abscesses develop in the thigh or lumbar region which cannot drain through the original incision, these are incised. In



FIG. 1.—(Case 1.) Preoperative roentgenogram showing definite destruction in the lower part of the left sacro-iliac joint.

other words, our postoperative treatment follows the usual principles as advocated by Orr in the treatment of osteomyelitis of the long bones.

These patients are often very ill from dehydration and sepsis, and unable to stand the radical operation at the moment. In such instances it is wise to drain the secondary abscesses in the soft parts, thereby diminishing the amount of toxic absorption, and build up the general condition of the patient by the free use of fluids, intravenously or otherwise, supplemented by blood transfusions. As soon as the general condition has been improved, the radical operation for draining the original focus of infection should be performed.

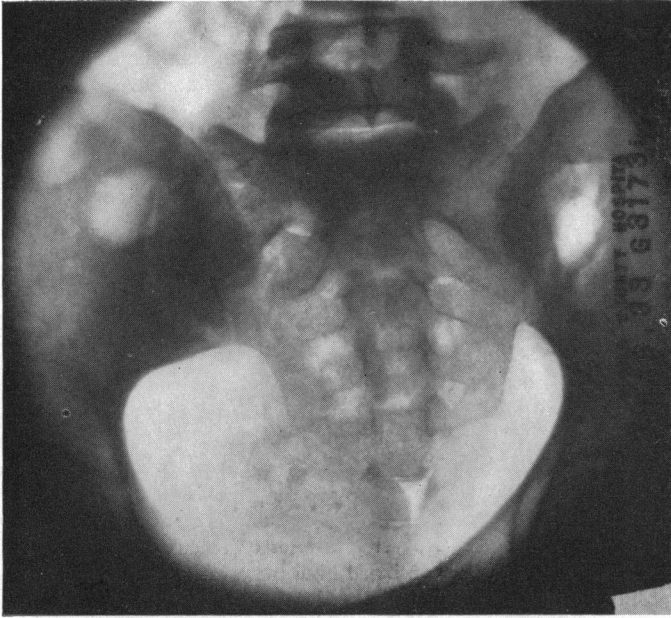


FIG. 2.—(Case 1.) Postoperative roentgenogram showing operative window through ilium and sacrum at sacro-iliac joint.

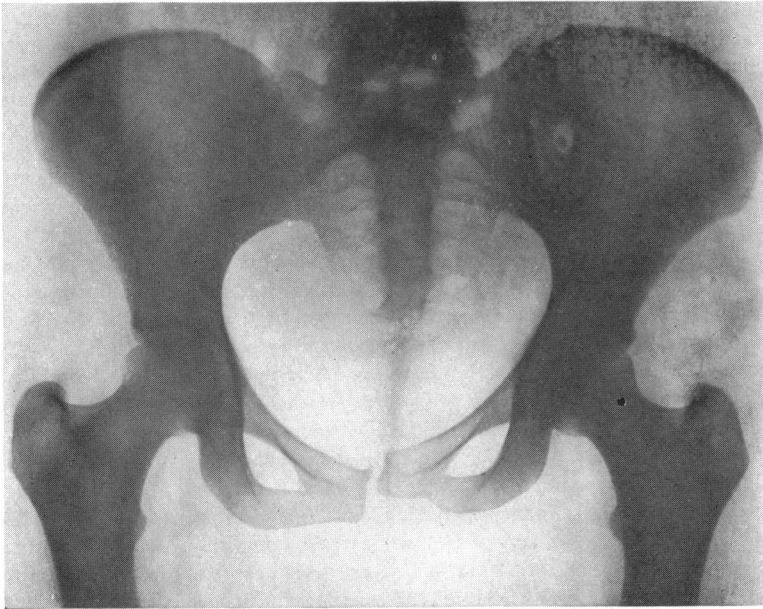


FIG. 3.—(Case 1.) Roentgenogram taken 13 months after operation, showing a filling in of the operative defect with apparently a small sequestrum present, which is not causing any trouble.

CASE REPORTS

Case 1.—Mrs. D., aged 24, white, female. Admitted March 9, 1933, to the Gynecologic Service complaining of pain in the lower back. Patient stated that the pain in the back started spontaneously about one week before admission, and that she first noticed it on attempting to turn. It gradually became worse until admission to the hospital. She also gave a history of having fallen on her abdomen five weeks previously, at which time she was two months pregnant. This was followed by a slight bloody discharge, and abortion two weeks later. She had no chills or fever at that time and had no medical attention.

Relevant physical examination on admission was as follows: Temperature on admission was 101° F.; respirations 22. She was pale, well-nourished, well-developed, poor hemic component, first heart sound roughened and had a systolic blow. Abdomen was soft. There was tenderness over the symphysis pubis, and a yellowish discharge from the vagina. There was tenderness over the left sacro-iliac joint. Hips were negative. Blood count on admission showed 9,800 white blood cells; 69 per cent polymorphonuclears; 2,624,000 red blood cells and hemoglobin of 55 per cent. A diagnosis of incomplete abortion and sacro-iliac arthritis was made.

An obstetric consultation on March 11, 1933, showed a soft cervix, large uterus, no masses or tenderness in either fornix. A diagnosis of pregnancy was made. Another gynecologic examination on March 14, 1933, showed the cervix closed, uterus apparently normal and markedly antiflexed. No pelvic masses or tenderness found. This consultation was requested because of the continued high temperature and increasing pain in the back in order to rule out sepsis in pelvic organs.

Roentgenogram March 15, 1933, showed a definite area of destruction in the lower portion of the left sacro-iliac joint.

On March 16, 1933, the patient was transferred to the Orthopedic Service where traction was applied to the leg which gave marked relief of symptoms, although the temperature persisted. On March 28, 1933, she exhibited a marked diffuse swelling over the left hip and thigh in spite of the fact that motions of the hip were free. There was marked tenderness over the left sacro-iliac joint. A provisional diagnosis of sacro-iliac suppuration was made.

Roentgenogram March 29, 1933, showed increased destruction. On the same day the operation as previously described was performed and followed immediately by a blood transfusion. An interesting point observed as the sacro-iliac joint was entered, was the free mobility of the iliac portion of the joint. It was actually a pathologic dislocation of the ilium upward on the sacrum. Free pus was not encountered until the pelvic cavity was entered through the sacrum, the pus having entered the iliac fossa by breaking through the anterior ligament of the joint. The temperature range was between 99° and 105° F. up to April 11, 1933. From then on it gradually declined to normal. Patient was allowed up on wheel chair on June 23, 1933, and she was discharged on July 10, 1933, walking well, wound healed, and wearing a sacro-iliac belt.

Case 2.—Mr. F., aged 20 years, male, white. Admitted to the hospital on March 31, 1933, complaining of pain in the back and general weakness. He stated that three weeks before admission, while working on a truck, he became weak. Had to stop work, went to bed, then felt better and was able to get about until the day before admission, when he complained of severe pain on even slight movement of the legs.

The relevant physical findings on admission: Temperature 104.2° F., pulse 110, respirations 22. A fairly well nourished white male, complaining of pain in the back, and moving with great difficulty. He had severe pain on pressure over the left sacro-iliac joint. There were spasm of the lumbar muscles, and pain on flexion and extension of the thighs. A tentative diagnosis of sacro-iliac infection and sciatica was made at this time.

An attempt was made to apply traction to the left leg to avoid flexion contractures

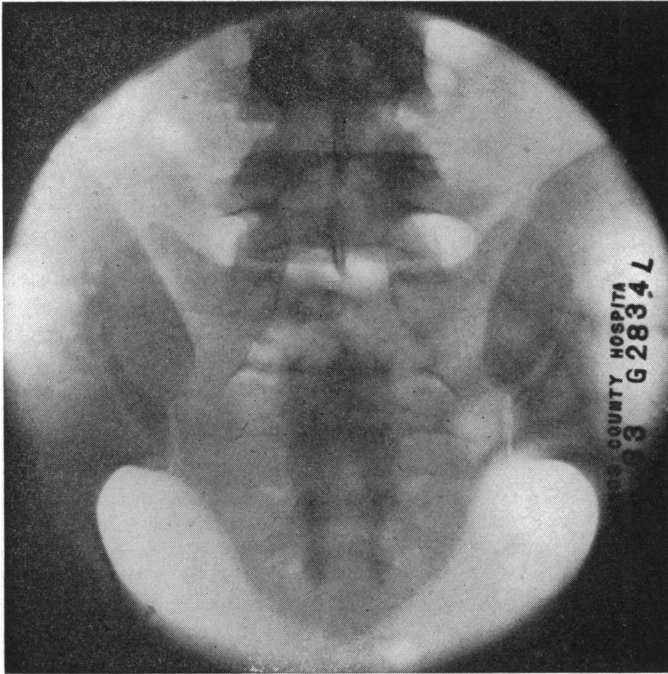


FIG. 4.—(Case 2.) Roentgenogram showing area of destruction about the lower half of the left sacro-iliac joint.

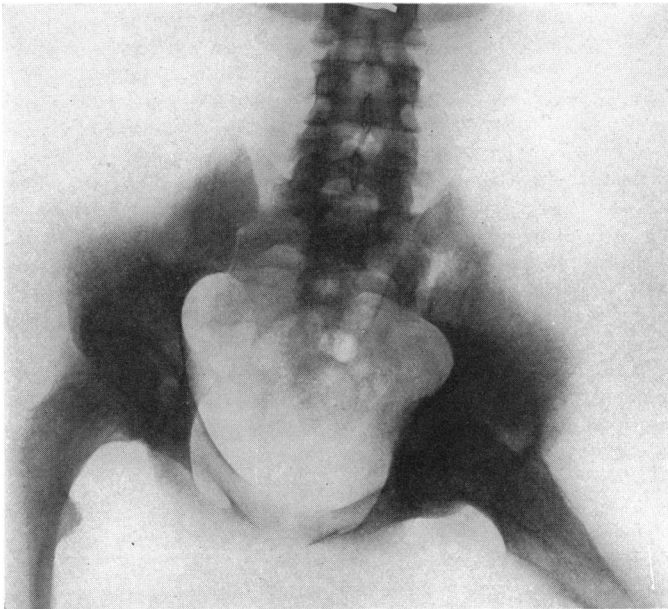


FIG. 5.—(Case 2.) Roentgenogram showing increased density of the ilium and bone proliferation inside of the pelvis over the dome of the acetabulum, and destruction of the hip joint, indicating that the disease extended downward along the ilium and involved the hip joint, producing a secondary suppurative arthritis of the hip joint.

at the hip and knee. This could not be tolerated even though as little as three pounds of weight was applied. It was removed and severe contractures did develop.

During the course of the disease, it was impossible to tell exactly when he developed an infection of the hip joint which drained through the back, as this joint was never directly drained. It healed with bony ankylosis and severe flexion deformity.

Operation was performed April 13, 1933, at which time 8 cc. of pus was evacuated from the soft tissues over the sacrum. Five transfusions were given: April, 19, May 3, 5, 24, and June 9, 1933.

A second operation for radical drainage was performed on May 4, 1933. The left sacro-iliac joint was exposed; on removing the block of bone from the ilium the articular cartilage of the sacrum was found to be eroded. The underlying bone, which appeared gray and necrotic, was easily removed by a curette, but no free pus was encountered. In this instance insufficient bone was removed from the sacrum. The pelvic cavity was not entered. Wound packed with vaseline gauze.

In August 1933, temperature 104°-105° F., a sinus opened spontaneously over the left lower abdomen. Under anesthesia this was enlarged and found to communicate with the operative wound through the iliac fossa; through and through drains were inserted.

The patient's general condition up to this time had been poor, but after the spontaneous evacuation of the pus in the iliac fossa through the abdominal sinus the temperature began to subside rapidly, and reached normal about October 1. Five months later, March 17, 1934, he was discharged from the hospital walking with a marked limp, the result of a knee and hip flexion contracture. The knee contracture was completely corrected by wedge casts. On April 18, 1934, he was readmitted for the correction of the hip flexion deformity by a subtrochanteric osteotomy of the left femur, and a subperiosteal separation of the hip flexors from the anterior iliac spine. This was successful, and he was discharged July 28, 1934.

In retrospect it is evident that adequate drainage of the iliac fossa was never established until spontaneous evacuation through the abdominal sinus, five months after the inception of the disease. Had proper drainage been provided, ankylosis of the hip would probably have been prevented, and his convalescence materially shortened.

Laboratory Findings.—Blood cultures were negative. Smear of the pus showed gram positive cocci in short chains, and culture, streptococcus brevis. Microscopic examination of bone removed from the sacro-iliac joint showed marked infiltration of bone marrow spaces by monocytic cells, and occasional areas of necrosis of bone spicules.

Roentgenologic Findings.—Five days after admission, April 5, 1933, there was a shadow in the lower part of the left sacro-iliac joint, suspicious of osteitis. Thirteen days later, and five days after the first incision and drainage, an increased area of destruction was reported. On April 27, 1933, nine days later, and one week before radical drainage, a third roentgenogram demonstrated still greater destruction of the joint.

Six months after operation, January 26, 1934, there was no evidence of active bone pathology in the sacro-iliac joint. The lesion had healed. There was a definite subperiosteal deposit of bone along the inner surface of the ilium within the pelvis, from the sacro-iliac joint to the ischial spine just anterior to the acetabulum, indicative of invasion of the hip joint via this route.

Case 3.—Miss A. Q., aged 19, white female. Admitted to the hospital January 26, 1934, complaining of pain in the right thigh. About four weeks before admission she had had a "cold." About five days after this, before the "cold" had cleared up, she noticed that on moving the right leg she had a dull pain in the thigh. For two weeks, despite progressively increasing pain, she continued to work, when she slipped and fell with both lower extremities abducted. She was carried home, and the pain became severe, and the leg stiff. Although no other joints were affected, the condition was diagnosed as rheumatic fever, and the patient treated at home for a week.

On admission the temperature was 102° F., pulse 112, and respirations 24. The patient was a well-developed girl, appearing acutely ill, moderately anemic, and evidently in pain. There was a systolic blow at the apex, which was not transmitted to the axilla. The abdomen was tense, although there was no definite rigidity. Some tenderness of both right and left lower abdominal quadrants was elicited. No masses were palpable. There was swelling and tenderness of the upper half of the right thigh, without local redness of the skin. No areas of fluctuation were present. The leg was held in 75° of flexion; all movements of the knee were limited, and any motion of the hip joint greatly aggravated the pain. Tenderness on pressure over the right shoulder joint was noted, and dull pain occurred on movement. A provisional diagnosis of acute infectious arthritis of the right hip, with a mild secondary anemia and mitral disease was made.

Traction was applied, ameliorating the pain. The swelling in the upper thigh persisted. An attempt was made to aspirate the joint, but no fluid was obtained. Four

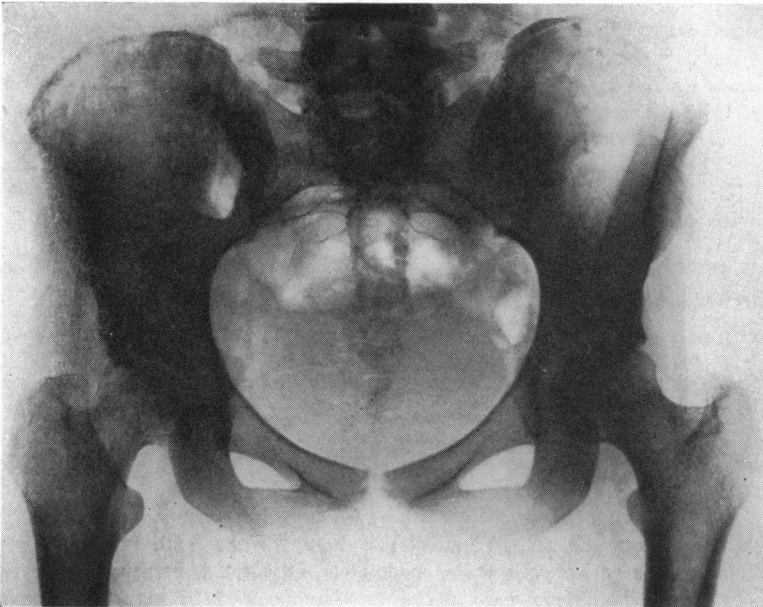


FIG. 6.—(Case 3.) Roentgenogram showing operative window through the sacro-iliac joint, and early destruction of the hip joint. This hip joint became infected through the iliopectineal bursa.

days after admission the temperature had risen to 104.2° F., the right shoulder pain persisted, pain in the hip was localized over the great trochanter. A medical consultation resulted in an opinion that the condition was not rheumatic fever. A gynecologic survey suggested the possibility of salpingitis.

Two days later, February 2, 1934, rectal examination revealed definite tenderness over the right sacro-iliac joint, but no evidence of a mass in the iliac fossa. On February 6, swelling of the upper thigh had increased, the right sacro-iliac was very tender to palpation, and roentgenograms showed a suspicious area of osteitis in the lower angle of the joint. Arthrotomy was performed two days later. Within the cancellous portion of the ilium, about one-half inch beneath the outer table, a few drops of pus were encountered; culture showed a staphylococcus aureus. Penetration was continued through the ilium into the sacro-iliac joint, and thence through the sacrum into the pelvis. The wound was packed with vaseline gauze.

The immediate postoperative reaction was stormy. The fever subsided somewhat, but continued to spike to 102° or 103° F. On February 23, 15 days postoperative, the patient began to vomit. No signs of intestinal obstruction were elicited. The attack subsided. On March 15 pain in the right leg, which had been dull and intermittent, increased in severity and constancy. On aspiration of the hip joint a turbid, light yellow fluid was obtained, which on culture showed staphylococcus aureus. Roentgenograms disclosed some diminution of the joint space and roughening of the articular surfaces. Drainage of the hip through an anterior incision was instituted.

In May 1934 a massive soft tissue abscess, which had gradually formed on the lateral surface of the thigh, was drained. The patient was extremely septic, pulse rapid, and the temperature, which had been ranging from 102° to 103° F., began to subside. Her general condition rapidly became weaker, and death occurred on May 26, 1934.

Throughout the illness repeated transfusions were given. Glucose and salt solutions were administered by infusion and clysis. Iron and liver therapy was used in conjunction with the transfusions to combat the severe secondary anemia.

Laboratory Findings.—Two blood cultures were taken but were contaminated. Blood Wassermann was negative. Gonococcic fixation test was negative. Specimens of the removed bone, on section, showed acute osteomyelitis.

Postmortem Examination.—On stripping the psoas muscle a large abscess extending from the brim of the pelvis upward to the level of the first lumbar vertebra on the right side of the abdomen was found. The muscles and fatty tissue had all undergone necrosis. The anterior surface of the sacrum was roughened and studded with necrotic areas. The head of the right femur was similarly involved. Diagnosis: Chronic osteomyelitis of the sacrum, right ilium and right femur.

COMMENT.—The right lumbar abscess was never diagnosed. It is doubtful whether drainage of this abscess would have altered the course of the disease, in as much as the essential picture was that of overwhelming infection.

Case 4.—Mr. S., aged 5 years, white, male. Admitted to the General Surgical Service March 16, 1932, complaining of pain in the abdomen of two days' duration, and pain in the right hip for one week. Temperature 101.8° F., pulse 128, respirations 28. Twelve days prior he had been knocked down by a bicycle. The following day a swelling in the right gluteal region was noted, and some pain complained of, which disappeared after using a liniment. Six days later a limp developed, pain in the right buttock returned, and abdominal pain began on the tenth day.

On admission the patient was toxic, moderately dehydrated, mucous membranes dry, tongue coated and both legs were flexed on the abdomen. Attempts to extend the thighs provoked pain, but hip motions within a restricted range were free and painless. There was generalized abdominal tenderness, with maximum intensity in the right lower quadrant, and rebound tenderness referred to McBurney's point. Three days after admission a swelling and induration on the medical aspect of the right thigh appeared. Operation was performed to institute drainage, but no pus was obtained. Six days later, on aspiration in the gluteal region, thick pus was obtained. Culture showed a growth of staphylococcus aureus.

On the following day, March 24, the area was incised, and the hip joint exposed. No infection observed. A pus pocket was found and evacuated posteriorly in the region of the right sacro-iliac joint. Penrose drains were inserted. There was some remission of the temperature for a week, but then a rapid rise occurred, spiking from 104° to 107° F. Blood culture at that time was negative. The fever persisted for many weeks, subsiding by lysis during July. He was discharged in October 1932, seven months after admission.

Eighteen months later, March 29, 1934, the patient was readmitted complaining of right lower quadrant pain of two days' duration, associated with vomiting. Both hips

were flexed on the abdomen. There were muscular rigidity and right lower quadrant tenderness. A diagnosis of acute appendicitis was made. On consultation with the General Surgical department the author disagreed with the diagnosis, and advised drainage of the sacro-iliac for osteomyelitis of the iliac bone. This was done by an associate, who did not carry the penetration through the entire pelvic wall. The abdomen was opened at the same time. Findings.—No free fluid, appendix normal, a retroperitoneal mass in the right iliac fossa. Two days after operation pus drained from the sacro-iliac wound. Convalescence was complicated by varicella, for which transfer to a contagious disease hospital was necessary. On return, May 9, 1934, septic temperature continued. The hip joint was opened on May 17. No infection was

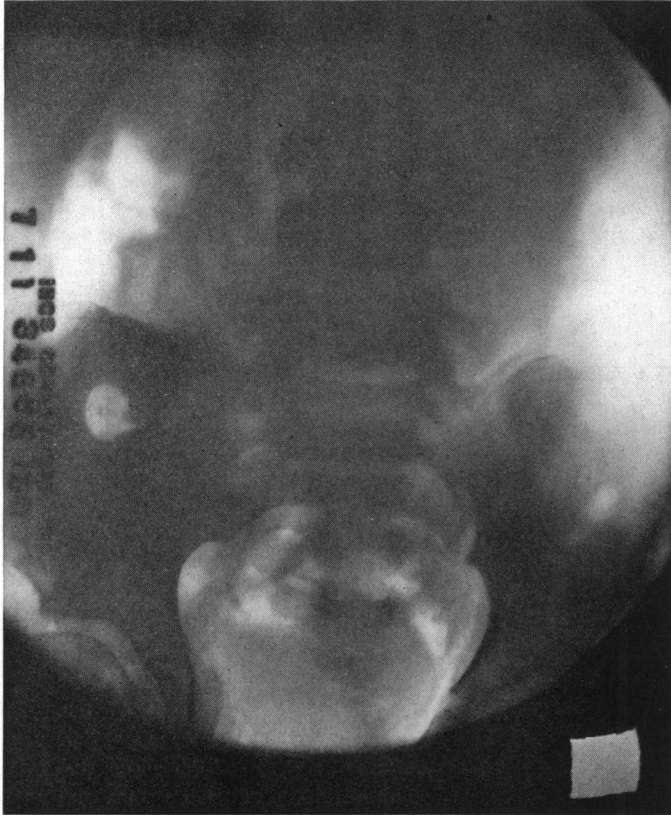


FIG. 7.—(Case 4.) Roentgenogram showing complete fusion of the sacro-iliac joint and involvement of the entire ilium. This patient was never adequately drained. We saw him during an acute exacerbation after the primary lesion had been healed and the patient had been walking about.

found within the joint, but a pocket was located beneath the lesser trochanter on the femoral shaft, evidently an extension along the iliopsoas muscle from the iliac fossa. The temperature subsided in seven days, and he was discharged two months later, July 15, 1934.

COMMENT.—On the first admission the diagnosis was entirely missed, and definitely overlooked on his second admission, resulting in a laparotomy with negative findings. Roentgenograms demonstrated involvement of the entire ilium and part of the sacrum. The pelvis was never adequately drained until

the secondary abscess areas, especially that along the iliopsoas tendon, were evacuated.

Case 5.—Mrs. P., aged 46, colored, female. Admitted to the hospital November 19, 1934, because of pain in the region of the right hip. Onset was acute. Three weeks before admission she had chills and fever, followed by pain in the right hip region, which gradually became worse until it was so severe that she was confined to bed. Pain was aggravated by motion, and relieved by rest. It radiated down the thigh to the knee and ankle. No history of injury. Temperature on admission was 100° F., pulse 112, respirations 26.

Relevant physical examination showed a middle-aged emaciated Negress, apparently chronically ill; unable to sit or stand. Some crepitating râles at the base of the lungs. There was a definite fullness about the right hip joint with tenderness in the inguinal region just below Poupart's ligament. Flexion of the hip was fair; rotation somewhat painful. Tenderness was elicited on pressure over the right sacro-iliac joint. The hip was maintained in about 10° flexion. The patient appeared very ill.

An orthopedic survey was made November 27, 1934. At that time there were two masses in the lower right abdomen; the one toward the midline was rather firm and movable, and not tender; a typical fibroid tumor in the uterus. The other mass filled the entire right iliac fossa on the right side. The groin showed a distinct fullness below Poupart's ligament. Vaginal examination revealed a fullness in the right iliac fossa, and a downward displacement of the uterus. There was also a distinct mass behind the hip joint, in the lower gluteal region. Tenderness was present on pressure over the sacro-iliac joint. Roentgenograms were negative for bone pathology. No pus was obtained from aspirating the mass in the iliac fossa, but was obtained from the swelling behind the hip joint.

A diagnosis of sacro-iliac disease was made, but radical drainage was delayed on account of the poor general condition of the patient. The gluteal abscess was drained December 3, 1934. Death occurred ten days later, and no autopsy could be obtained.

Laboratory Findings.—Blood Wassermann was negative. Culture of pus from the hip joint showed a nonhemolytic streptococcus. Smear showed many gram positive cocci in short chains.

CONCLUSIONS

- (1) Five cases with suppuration of the sacro-iliac joint are reported.
- (2) The difficulty in making an early diagnosis has been pointed out.
- (3) A plea is made for earlier diagnosis and proper adequate drainage in these cases.
- (4) The group reported had a mortality of 40 per cent.

REFERENCES

- ¹ Bardenheuer: Quoted by Jacob Kulowski.
- ² Campbell, Willis C.: *A Textbook of Orthopedic Surgery*. Philadelphia and London, W. B. Saunders Company, 1930.
- ³ Chandler, F. A.: Pneumococcal Infection of Sacro-Iliac Joints Complicating Pregnancy. *J. Am. Med. Assn.*, 114, July 8, 1933.
- ⁴ Clarke, S. T.: Psoitis and Peripsoitis. Their Pathology and Differential Diagnosis. *Transactions N. Y. State Med. Assoc.*, 2, 70-84, 1886.
- ⁵ Goldman, Harry: Infectious Arthritis of the Left Sacro-Iliac Joint Due to Blind Internal Fistula. *International Journ. Gastro-Enterology*, 1, No. 1, 80, July, 1921.
- ⁶ Gongolpre, M.: Treatment of Suppurative Psoitis by Trephining the Pelvis. *Revue de Chirurgia*, March, 1889. Reviewed in *ANNALS OF SURGERY*, 10, 383, 1889.

- ⁷ Jones and Lovett: Textbook of Orthopedic Surgery, second edit. New York, William Wood & Co., 1929.
- ⁸ Kulowski, Jacob: Pyogenic Osteomyelitis of the Sacro-Iliac Joint. *Am. J. Surg.*, **23**, 305-313, February, 1934.
- ⁹ Parker, J. L.: Study of Twenty Cases of Sacro-Iliac Tuberculosis at Lakeville State Sanatorium. *N. Eng. J. of Med.*, **205**, 573-577, September 17, 1931.
- ¹⁰ Picque, R.: The Treatment of Sacrocoxalgia by Sacro-Iliac Resection. *Bull. et mem. Soc. de Chir.*, **35**, 1107, 1909.
- ¹¹ Poore, C. T.: Disease of the Sacro-Iliac Synchronrosis. *Am. J. Med. Sciences*, **75**, 62-93, January 1, 1878.
- ¹² Potreau-Roussel and Huard, P.: Melitococcic Spondylitis and Sacro-Iliac Arthritis with Bilateral Abscesses in the Buttocks Which Simulated Cold Abscesses. *Bull. et mem. Soc. nat. de Chir.*, **57**, 1561, 1931.
- ¹³ Sashin, D.: A Critical Analysis of the Anatomy and Pathological Changes of the Sacro-Iliac Joints. *J. Bone & Joint Surgery*, **12**, 891-910, October 1930.
- ¹⁴ Villeneuve: Quoted by W. C. Wood.
- ¹⁵ Wood, W. C.: Post Puerperal Psoitis. *ANNALS OF SURGERY*, **29**, 143, 1899.
- ¹⁶ Young, James K.: Acute Suppurative Arthritis of the Sacro-Iliac Joint. *Urologic and Cutaneous Review*, **20**, No. 9, 493, September 1916.