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Introduction.

After a careful examination of the various surgical cases which have come under my notice in this Institution, and which might be suitable as subjects for a graduation Thesis, it has appeared to me that for importance, frequency and complexity, these cases of hip joint disease, which call for operative interference stand second to none. I have had exceptional opportunities of studying this disease, both in the Out-patient Department, and in the wards of this Institution, in its early stages, and in those more advanced. On account of the importance of the indications for and against operative interference in advanced hip disease, which so frequently come before the consideration both of the hospital surgeon and the general practitioner, I have made more particularly a study of those cases in which the operation of secession is required.

It is my object here to describe and discuss certain cases of secession of the hip joint, which have come under my own care, and to contrast these with other published accounts.
Section I. A Description of eight cases of excision of the Hip, treated in the Bolton Infirmary during the years 1885, 1886, under my own observation.

Case I. Septic abscess of the femur: the head and articular cartilage entirely destroyed; the neck and great trochanters involved; abscess formation of traumatic origin; excision of head, neck, and trochanters; Recovery with a freely movable and useful limb.

A.G.—act: 13 years. History. Five years before admission, she fell off a mangle, alighting on her left hip on one of the projecting screws. Severe pain and swelling followed; and subsequently suppuration occurred in the groin, which was poulticed and burst. Immediately afterwards, when allowed to get up and walk, it was noticed that she limped, and complained of stiffness & soreness about the left hip joint. The sinus, which was left by the abscess in the groin, continued to discharge. Two years before admission further abscess formation occurred on the outside of the thigh, when she was admitted to the Manchester Royal Infirmary, where she remained under treatment eighteen weeks. On the 11th May 1885, she was admitted to the Bolton Infirmary.
State on Admission. The girl was pale and manicured, having an anxious expression of countenance, with a decidedly scrofulous diathesis. The affected limb was about an inch shorter than the sound one; slightly flexed at the hip and knee and much swollen. No dislocation could be detected. There was considerable swelling about the affected hip, and on the anterior and outer aspects of the joint were two sinuses, which discharged profusely. Both the sinuses lead down to diseased bone.

Treatment and Progress. She was put on a liberal diet, tonic (iron and cod-liver oil) administered, and a simple traction apparatus applied, the limb being steadied by means of sand-bags. Poultices were applied to the thigh. In spite of the tonic treatment and the maintenance of rest, the discharge did not decrease, and the child was observed to be loosing ground, so excision was determined on.

On June 26th 1865, the operation was performed. A longitudinal incision was employed on the outside of the joint, about four and a half inches in length. The head, neck, and trochanters were removed. The acetabulum was examined, but found healthy. No ligatures were required, as the hemorrhage was inconsiderable.
She soon recovered from the effects of the operation, with
the exception of continuance sickness from the chloroform;
and in a week afterwards there were decided signs
of improvement in her general condition.
The temperature rose to 101° F immediately after the
operation, but subsequently never got above 100°.
The wound gradually filled up with granulation
tissue, the discharge becoming less and less.
On August 29th the note was: “Slight movement at
the hip allowed attended by no pain; allowed up;
is gaining flesh daily.”
On September 15th, eleven weeks after the operation,
the wound was quite healed up. The sinus on
the front of the thigh was houmous, not closed,
but discharging very slightly. She was now
allowed to go about the ward on crutches, and
could bear considerable weight on the limb with-
out any pain. There was free movement in
every direction. Her general condition of
health was much improved, having become
quite robust and cheerful. Discharged
October 2nd, 1885, 14 weeks after operation.
April 5th, 1886. The child walked about a mile
to come and see me. She was quite well
and her general health was most satisfactory.
The sinuses about the hip had quite healed. There was free movement in the joint, and she could bear sufficient weight on the limb to enable her to walk without crutch or other support.

**Case ii.** Caries of femur; its head and neck involved; no acetabular disease; abscess formation about the hip; disease of haemorrhages of head and neck of femur; death seven months after operation from tubercular meningitis.

J. G. — act. 4 years.

History. Six months before admission he was kicked on the right hip by a girl. About a week afterwards he began to limp and complain of severe intermittent pain in the right knee. Later he complained of deep seated pain in the thigh in the region of the great trochanter. On December 17th, 1884 he was admitted to the Bolton Infirmary.

State on admission. There were, on admission, all the characteristic signs of chronic disease of the hip joint in its second stage;—almost continuous pain in the hip and knee,
flattening of the toes on the affected side, slight abstraction, etc.

Treatment and Progress. He was treated at first in the usual manner by means of traction and the long splint. A liberal diet and tonics given. Three months after admission, however, an abscess formed on the outer side of the hip, accompanied by pain, necessitating the removal of the splint and after-splint. The abscess eventually "pointed" and it was opened with all antisepctic precautions a drainage tube being inserted into the abscess cavity. It however got putrid, the discharge becoming very profuse and offensive. hectic symptoms then developed and it was deemed advisable to excise the joint.

On the 24th July 1885 the operation was performed, the femur being divided at the neck. A longitudinal division was employed on the outside of the limb. No difficulty experienced during the operation. Considerable haemorrhage, no ligatures being required. No acetabular disease. An interrupted long splint applied immediately after the operation, and a small after-splint (3lbs) put on
Three Days after the operation.
For the first fortnight the discharge was fairly copious, but after that time it got gradually less. The boy's health took a favourable turn and steadily improved.
Five months after the operation the incision was firmly healed, and he was able to get about on crutches quite well. There was free movement in the joint, and the boy was making rapid progress, when unfortunately he contracted whooping cough.
Later, in the beginning of February, symptoms of tubercular meningitis developed, of which he died on the 21st of that month.
This case, therefore, cannot be regarded as a death due to the operation, as the boy had practically recovered.
The parents would not hear of a post-mortem examination being made, so I was unfortunately unable to make an examination of the newly formed hip-joint.
Case III. Caries of femur; head, neck and great trochanter involved; similar disease in acetabulum, with perforation of that cavity and formation of intrapelvic abscess; excision of head, neck, trochanter and part of the acetabulum; continued suppuration; still under treatment.

T. G. — Age: 10 years.

History. Nine months before admission, when playing football in the school yard, he was knocked down, pitching on his left hip. The parents noticed nothing until about three weeks after the above accident it was observed that he limped in his walk. He did not complain of any pain, but his mother noticed that he occasionally awoke up in the night with a scream. No treatment was adopted until about a month before admission, when, owing to the occurrence of acute pain in the hip, medical assistance was called in. He was ordered to bed, and remained there until the 31st July 1885 when he was admitted to the Bolton Infirmary.

State on admission. As in the last case, there were all the characteristic signs of hip disease in its second stage. The pain was situated on the outside of the thigh, occasionally shooting across
on the thigh to the middle of the knee. It was very
much aggravated by percussion over the great
focalner, and where the limb was flexed and
circumducted at the hip joint.

Treatment and Progress. The usual remedies
were applied at first. The splint and extension
were kept on for nearly four months, but were
removed at the end of that time on account of
considerable swelling about the hip joint, with
increased pain and elevation of temperature. No
suppuration could be detected. The limb was
then simply placed between two sand bags to steady
it, and for a time the symptoms remained
stationary.

On December 15th, suppuration was detected, and, as
much as the boy's health was beginning to give
day, and he was becoming much anaemic, it was
determined to make an exploratory incision into the
joint for the purpose of ascertaining the extent of the
disease, and if there were suppuration within the
capsule of the joint. An exploratory incision
with all aseptic precautions was accordingly made,
a considerable quantity of thick pus being evacuated.

On pressing the finger into the wound it was found
that the head, neck and a portion of the great focalner
were curious, so it was deemed advisable to further proceed to secure the curious portion of the bone. This was done. On examining the acetabulum, perforation of that cavity was found to have occurred, with the formation of an intra-pelvic abscess. As much of the acetabulum as could be was removed by the gouge. The head, neck, and trochanters of the femur were removed. No ligatures required. An antiseptic (carbolic fuming) dressing was applied. No splint or stitches put on until the third day after the operation. The boy speedily recovered from the effects of the operation, and went on well for some weeks. The discharge, however, continued to be very profuse, necessitating almost daily dressings, and, moreover, the boy’s health did not show any signs of improvement, as was anticipated. April 5th 1886. Condition much the same, the discharge being rather diminished in quantity, but still very copious. In all probability the disease is spreading in the pelvic bones. Still under treatment.
Case IV. Caries of femur: head and articular cartilage entirely destroyed; neck and great trochanter involved; similar disease in acetabulum; dislocation backwards on to dorsum ilii; abscess formation about hip; necrosis of head, neck and trochanters; still under treatment, but doing well.

J. R — act: 10 years.

History. Two years before admission, he was knocked down in a crowd, and got trampled upon. Almost immediately after, the boy was noticed by his mother to limp. Eventually, the limping got so much worse, the boy being bent almost double, part of the weight of his body being supported by resting his hand on his knee, that a medical man was called in. On the 8th January 1865, he was admitted to the Bolton Infirmary. He then had all the characteristic symptoms of chronic hip joint disease, and was treated in the usual manner, the treatment being continued for three months. At the end of that time, the splints and.semission were removed, and as all the symptoms had disappeared, a Thomas' splint was applied and he was sent off to the Cheshire Convalescent Hospital.
He was lost sight of them until in August 1875 he presented himself again and was admitted.

State on admission. The limb was placed on to the abdomen at the thigh and much circumscribed, the knee of the affected limb lying over the thigh of the sound one. Dislocation backwards on to the dorsal ilium had occurred, with abscess formation about the dislocated head of the bone, but which had not burst. Shortening to the extent of 2½ inches of the affected limb. In fact, all the characteristic appearances of advanced hip disease.

Treatment and Progress. Poultices to the hip were applied, food food and lozenges. Eventually the abscess pointed and burst.

On August 30th an erysipelas inflammation of the whole limb set in, which gradually subsided under the application locally of the Tincture of the Perchloride of Iron. The discharge from the sinus however became much more profuse and the general health was necessarily failing.

On Nov. 1st 1875. Revision of the head, neck and trochanter was performed, the cavoir portion
of the acetabulum being gouged away. After the first week the general health began to improve, the discharge becoming gradually less. The pain also, which he had suffered from in the hip and knee disappeared and he has been quite free from it since.

April 2nd 1888: Wound nearly healed; still some slight discharge. General health much improved, countenance quite cheerful & he is becoming quite fat. No signs about the wound on crutches.
Still under observation.

Case V. Caries of femur: head, neck and trochanters major involved; similar disease in the acetabulum; Dislocation back wards on to Dorsum ilii; Abscess formation; disease of trunacar oriæ; Reunion of head, neck and trochanters; recovery with a freely movable joint.

E. K. --- aged 50 years.

History: Five years before admission she fell down stairs, alighting on her right hip. The motion didn't take much notice of the
accident at the time, but about a fortnight afterwards she noticed that the child gave way on the right side while walking. She was also observed to occasionally wake up in the middle of the night with a scream. Medical assistance was now called in, and something (probably iodine) painted on the hip, and liver oil administered, and confinement to bed advised. The treatment was continued for three months, but at the end of that time there was little improvement, and she was allowed to go about again. Twelve months after the accident, an abscess formed on the outside of the hip, was poulticed and burst, continuing to discharge profusely until her admission on 7th July 1886.

State on admission. There were all the characteristic signs of advanced hip disease present in this case; dislocation, shortening, sinuses (four) one and about the great trochanter and all leading down to dead bone. The child was weak...
and amputated.

**Treatment.** On September 11th, 1898, the head, neck, Kocherios and a portion of the acetabulum were excised.

No ligatures were required. A long interrupted splint applied immediately after the operation, and extension knee for four days after.

After the first week the child made rapid progress. In eleven weeks the incision was soundly healed, but two of the sinuses remained open, although discharging very little. Free movement in the joint unattended by any pain.

April 17th. Quite well, being fat and robust. The two sinuses are still open but discharging slightly. Gets about on crutches quite well, and can bear considerable weight on the limb without pain.
Case vi. Caries of femur: Neck and trochantin involved; head and femoral articular cartil age destroyed; Dislocation on to the posterior iliac crest malposition of limb with slight fibrous ankylosis; abscess formation, with continued suppuration; Excision of head, neck and trochantin; recovery in three months with useful limb.

J. F. — act: 11 years.

History. Seven years before admission he was hit on the left hip with a stone; which was followed by considerable ecchymosis and swelling about the joint. Deeches and blisters were applied, & he was confined to his bed for some weeks. In spite of the treatment, however, he was noticed to limp on the left side, when he was allowed to go about again. He also complained of an intermittent pain in the left hip and knee. Eighteen months after he was treated at St. Mary's Hospital, Manchester for seven weeks with elevation and a long splint, but derived no benefit therefrom. Two years afterwards, abscess formation occurred on the inside of
The thigh, gradually bursting. Later, further abscess formation occurred on the outside of the limb, and it was now noticed that his thigh was becoming acutely flexed on to the abdomen. For three years before admission he had been confined to bed. Admitted on the 3rd November 1835.

State on admission. The limb was then about three inches shorter than the sound one, and acutely flexed at the hip on to the abdomen, the leg being flexed on the thigh. The limb was also much inverted.

Dislocation on to the dorsum. The muscles of the thigh were much wasted; the hip itself was considerably swollen; and about the joint were four sinuses, which all lead down to dead bone, and were discharging profusely. The boy looked haggard and had no pleasure in life on account of the malposition of the limb necessitating his lying on the prone position. On examining the joint under chloroform, there was antisyphilitis detected. Owing, however, to the
continued suppuration and the presence of
diseased bone detected by the probe, it was
deemed advisable to make an exploratory
incision for the purpose of further spacing
the joint. On November 20th, this
was accordingly done, an incision over
the dislocated head being made. On pass-
ing the finger into the wound considerable
disease, involving the neck and great
trochanter, was detected; so incision was
determined on.

**Treatment.** The above exploratory incision
was enlarged and the head, neck and
trochanters of the femur were resected.
No ligatures were required. No splint
applied, the limb being supported by means
of sand bags. The boy began to
improve in health almost immediately, and
went on well.
At the end of eight weeks the wound
was quite healed, and in a fortnight
after the sutures had closed.

**Discharged Feb: 19th 1856.** Could walk
quite well on crutches. Was quite healthy
and had got quite fat.
Case VII. Caries of femur: acute articular ulceration of femoral cartilage, and superficial caries of the head of femur; pus in capsule of joint; Excision of head and part of neck of femur; No acetabular disease; Still under treatment; Doing well.

W. M. — act: 16 years.

History. Seven weeks before admission, he was walking home from his work, a severe pain shot into his left knee. Previously to this he had been quite well, following his usual occupation. He does not remember ever having hurt or twisted his hip in any way, and there was no lump or noticable previous to the accession of pain. He was confined to bed, as the slightest movement of the limb caused acute pain.

Admitted on the 26th December 1886.

State on admission. The left thigh, as he lay in bed, was flexed on the abdomen, the leg on the thigh. The left hip was slightly swollen and extremely tender; there was no shooting. He complained of intense pain in the left hip, shooting down to the knee, aggravated by the slightest
movement of the limb. Even turning or shaking of the bed caused an excruciating pain.

Chloroform was administered for the purpose of further examining the joint. On flexing the thigh at the hip, a peculiar crepitation was felt, not unlike the crepitation got in fracture of the neck of the femur.

No separation could be detected, although there was swelling about the joint.

Acute articular ulceration was diagnosed, with very probability the presence of pus in the capsule of the joint.

Treatment and Progress. Tonics and counterirritants etc. were tried, but in spite of everything the boy got worse and worse; his general health manifestly failing.

On January 15th 1886 an exploratory incision was made over the outside of the hip, and the above condition found. On opening the capsule about three ounces of thick pus were evacuated. Under the circumstances it was deemed advisable to proceed to the operation of excision. The primary incision
was enlarged, and the head of the femur
and part of the neck were removed.
The femoral articular cartilage was found
to be almost completely ulcerated away,
two or three small portions at the margin
being still intact, but partially detached
from the head of the bone. There was also
superficial caries of the head of the
femur.
After the operation there was considerable
sequestrum, which was steadily stopped by
means of pressure, no ligatures
being required. The severe pain in the
hip and knee disappeared almost immedi-
ately after the operation, and has not
recurred since.
April 10th: Doing well. Wound nearly
healed. No pain and general health
much improved.
Still under observation.
Case viii. Caries of femur: head almost completely obliterated; neck and trochanter widened; Suture in acetabulum; Dislocation on to ischium; abscess formation; excision of head, neck, trochanter and portion of acetabulum; recovery in four months with useful hind.

M. H — aged 14 years

History. She began to limp and complain of pain in the knee and hip ten years ago. The mother cannot assign any reason for its commencement. Eventually, abscesses formed about the joint & burst, leaving sinuses which remained open until her admission on December 2nd 1886.

State on admission. All the characteristic symptoms of advanced chronic hip joint disease; right thigh placed on abdomen; much inured; Dislocation on to ischium; sinuses (3) about the hip discharging copiously, discharging to the extent of 2½ inches. She also had a cough and complained of night sweats. Countenance pinched and anxious, expression and manner deliberate, just like a little old woman.
Treatment and Progress. She was placed under a course of tonic treatment, iron and cod liver oil, with a nourishing diet, the treatment being continued for nearly six weeks.

On January 8th, 1886, occlusion of the head neck and trachea of the phrenic, small portions of the acetalbumen being poured away.

After treatment, exactly the same as in the above cases. There was almost immediate relief from the pain, and the child made rapid progress.

On March 20th, the note was "wound completely healed; sinuses closed; the gait quite fair and robust; cough and night sweats disappeared; allowed up."

On April 2nd, Discharged, her condition then being most satisfactory. Could walk quite well with the aid of crutches, bearing a considerable amount of the weight of the body on the affected limb. Two and a half inches of shortening. Her convulsions had quite lost the pimpls and appear to suppress. Result most satisfactory.
B  Analysis of the above eight cases, as to:

i  Causes.
In seven of the cases, a distinct history of injury was eliminated. (Cases i. ii. iii. iv. v. vi. vii.)
In one case, the commencement was insidious, apparently without any cause. (Case viii.)

ii  Previous duration of the disease.
In four of the cases, the previous duration was over five years (Cases i. v. vi. and viii.)
In two cases, over one year (Cases ii. iv.)
In two cases, nine months and two months respectively (Cases iii. vii.)

iii  Age and sex.
The ages were respectively 13, 14, 10, 10, 8, 11, 16 (14 years).
The sexes were females 6. males 5.

iv  Conditions of disease.
In all the cases there was caries of the femur with destruction of the femoral articular cartilage.
In one case, the head of the bone was involved (Case vii.)
  "  one " the head and neck ... (Case ii.)
  "  six " the head, neck & trochanter major were involved (Cases i. iii. iv. v. vi. viii.)
In four cases, the acetabulum was carious and required gouging (Cases iii. iv. v. viii.) In one of these cases (Case iii.), there was perforation of
the acetabulum, with the formation of intra-
pelvic abscess.

In four cases, dislocation on to the dorso-
ilium had occurred (Cases iv. v. vi. viii)

V. The operation.

In all the cases the method of operating
was almost identically the same, so that
one description will suffice.

The incision employed was a simple
straight longitudinal incision, from 2½ to 5
inches long, extending on the outer side of the
thigh, over and above the great trochanter.
The muscles attached to the great trochanter
were divided by making the knife in the
longitudinal incision, the periphragm then
passed along the neck of the bone to the joint
or to the dislocated head lying on the dorso-
ilium. In any further detachment of the
soft parts the knife was simply directed
towards and on to the bone. The capsule
of the joint was in the first instance merely
incised in a longitudinal direction, and
afterwards at both sides at the margins of
the acetabulum. Adduction, rotation
inwards, together with a push upwards
readily made the head of the bone start from the acetabulum or from the foramen
ili, if dislocated. In case vii there was some difficulty experienced in doing this,
considerable force being required to make the head of the bone start out from the
acetabulum through the wound. The whole
of the diseased portion of the bone was then
removed either at once or at successive
sections with a Butcher's saw, until healthy
bone was reached, the soft parts being
protected by means of metal retractors.
Lastly, the acetabulum was examined, and if
necessary any carious or necrosed bone re-
moved by gouge or bone forceps.
No ligatures were required in any of the cases
as the haemorrhage was inconsiderable. In
case vii, there was a considerable amount of
oozing after the operation, which was readily
stopped by means of pressure.
No sutures were employed, the wound being
left open to heal by granulation, thus
allowing a more ready escape of discharge.
The wound in each case was lightly packed with
Carbonic acid lint, and afterwards well
dusted with powdered iodoform.
In case III, the operation was performed with all antiseptic precautions, an antiseptic (carbolic gum) dressing being applied. A long interrupted splint was as a rule applied immediately after the operation, a small (3 lbs) elastic bandage being put on three or four days after the operation.

VI. The result.
In four cases, there was recovery with a useful limb. (Cases I, V, VI, VIII)
Still under treatment, three cases (Cases III, IV, VII)
*Death in one case. (Case II)

In case I, the result was permanent ten months after operation.
In case VI, the result was permanent six months after operation.

* Died seven months after operation, from tubercular meningitis. He was quite convalescent from the operation.
* Science and Art of Surgery. Frickson.
vol. ii p. 441.

† Article on Membranous Cataract by Levard A. Sayre MD
New York 1853.
Section II

Short Summary of Hip Joint Disease.

In discussing the operation of seisin of the hip joint, it is necessary to say a few words in connection with the causes, symptoms and treatment of the disease generally. I shall, therefore, give a short summary of hip joint disease.

A. Causes.
The great predisposing cause of morbus coxanis is undoubtedly stroma. *Eichel's in his work on Surgery, says "Hip joint disease most commonly occurs in stromous subjects, and indeed, I think," its connection with scrofulae is generally more distinctly marked than that of most other affection of the joints."

It is, however, a difficult matter sometimes to distinguish between a stromous diathesis and the condition, which is often produced by advanced hip disease, especially in those cases where there has been much of haemorrhage suppuration and protracted suffering. †Samp in his article on morbus coxanis recognized him for he say, "I believe that many have attributed the source of the disease to a stromous origin, simply from the appearance of the"
patient, whose exacerbated, spasmodic condition
is regarded as the cause, when it is in
reality, the effect of the disease.

Saxe, however, goes on to say that the
disease is never produced by a constitutional
predisposition only, but always requires some
extraneous cause, such as violence or exposure.
This I cannot agree with, as I have in many
cases been unable to elicituate any history
of injury or exposure to cold, but where
there has been a marked stramineous diathesis
and the disease seems to have been the
result of the constitutional predisposition.

The exciting cause are numerous and varied;
the commencement of the disease often being
attributed to some over exertion, a sprain of
the joint in leaping or running, or to a
bruise of the hip from falling.
Exposure to cold and wet are often put
down as the exciting causes of the
disease.
B. Symptoms and Progress.

The symptoms vary according to the acuteness of the inflammation in the joint; those of acute arthritis being sudden in their onset and rapid in their course; those of chronic staminous arthritis coming on insidiously and running a protracted course.

i. Symptoms and Progress of Acute Arthritis.

Very often without any assignable cause, there arises a sharp, shooting pain in the hip joint, attending from the thigh to the inside of the knee joint, and increased by any pressure on or movement of the hip. Occasionally the pain is felt at first only on the inside of the knee. The pain is of an exacerbating character, aggravated by the slightest thing that causes any movement; for example, the shaking of the bed, a fit of coughing, or sometimes the weight of the bed clothes. The limb is placed on & the abdomen, stretched, and any attempt at outstretching the limb is excessively painful. Sometimes there is a distinct swelling about the joint, with an increased local heat. These symptoms are accompanied by a great
amount of constitutional disturbances, the temperature being very high especially in the evening. Standing or walking are attended with acute pain, or are altogether impossible.

If the inflammation does not subside, it passes on to acute suppuration, with augmentation of all local and constitutional symptoms. Pus collects in the joint, the form takes on a hectic character, and the abscesses become superficial. The case may now end from exhaustion or long continued hectic and suppuration; or the disease may pass on to a subacute or chronic condition.

ii. Symptoms and Progress of Chronic Arthritis. There are three well recognised stages in hip joint disease.

First stage. The disease almost always commences insidiously, the first symptom often being a feeling of slight weakness or of some pain, with a certain amount of stiffness at the hip joint, which is always increased by motion. As a consequence of the stiffness or pain the child is noticed to limp and walk in an
unusual manner. The greater part of the weight of the body, when standing, is borne by the sound limb, the affected limb being slightly bent at the knee and slightly rotated. The pain, which does not as a rule come on until late in the first stage, is specially felt when pressure is made on either the front of the joint or on the hip in the region of the greater trochanter behind, and is increased by walking, standing or "jarring" of the leg. It is often referred at this stage to the urinary or sometimes to the front of the knee joint. Startings at night are very often noticed at this stage. There is more or less of immobility of the limb, limiting the movements of the joint to a great extent.

Second Stage is characterized by the appearance of the following symptoms:—
Flattening of the nates, with a lateral twisting of the spine; more or less continuous pain in the knee and hip joint, all movements in which the hip participates being the source of increased pain; the thigh is wasted and flabby; the
whole weight of the body rests on the outstretched sound limb; there is a greater degree of flexion of the knee, and inversion is more pronounced; abduction and apparent lengthening of the affected leg; arching of the back when the patient is placed on his back and the flexed knee straightened; the lumbar becomes more pronounced; sometimes contraction of certain muscles is occasionally spasm of these muscles, especially at night.

The second stage gradually merges into the third stage, which is characterized by the appearance of shortening of the affected limb, either as a result of want of growth from disease, or spontaneous hypaesthesia which sometimes happens, or of obstruction of the head of the bone.

Abscesses form around the hip, bursting in turn leaving sinuses which lead down to the diseased head of the bone. The abscesses may burst into the pelvic cavity, pointing at Poupart's ligament. Adduction of the limb occurs as the case
becomes more advanced, the knee of the affected limb being brought across the sound thigh. There is spasm of certain muscles, and later the contracted muscles gradually get shorter and shorter, becoming permanently and organically contracted. The disease may go on to this stage recover, but will in the majority of cases a useless limb, or the suppuration may continue, the hip becoming dotted and finally death from sepsis or some entrenchment visceral disease.

C. Treatment of Hip Joint Disease.

Treatment of the first stage. It is of the utmost importance that the disease be recognized as soon as possible, in order that the child may be subjected to treatment at once. The great indication in the first stage is to keep the hip joint absolutely at rest, and for this purpose various appliances have been invented and used, for instance, cotes, couch, anes bed, Bennet's sand apparel etc. I think, however, that the method,
which are now in common use are the most efficacious and the least irksome to the patient; namely, the long splint with or without expansion, Hamilton's double long splint or box splint especially for children, and Thomas' splint. The adoption of either of these appliances must depend of course on the acuteness of the inflammation in the joint, on the symptoms and on the position of the limb. As a rule the application of the long splint together will often in for a period of from two to three months, followed by the wearing of a Thomas' splint, will be found efficacious. The rest must be continuous and for an adequate period.

Inunction of Mercury, advocated by Scott, the use of the actual cautery, blistering on the joint; setons and incisions have all been tried and recommended in the earlier stages of hip disease. The inunction of Mercury is useful especially in the cases where the disease commences in the synovial membrane of the joint (white swelling).
provided the joint be kept at rest by suitable contrivances.

The general health must be attended to.

Treatment of the Second Stage.

The indications in this stage are to obviate any malposition of the limb that may be present, to fix the limb in the straight position, and to alleviate the pain and chronic muscular spasm which are characteristic of this stage.

The malposition can as a rule be easily managed by means of manipulation or by a slight traction apparatus applied to the limb. If there is much difficulty experienced in doing this, chloroform should be administered and the limb straightened.

The methods enumerated above are to be employed to satisfy the second indication. The pain and chronic spasms will be alleviated by the application of an extension (weight and pulley). Myolomy has been proposed and tried for this purpose, but as a rule the treatment alone indicated is quite sufficient.
Treatment of the Third Stage.

All the methods advocated for the first and second stages should be tried. When suppuration occurs about the joint it is better to obtain from opening the abscess, as absorption has occasionally taken place.

If the pain is great and the pus too deep-seated to be conveniently reached, the actual cavity has been employed and found to give relief. If the pain continues still to be great the know or knife may be used, adopting in the latter case Hilton's method of opening an abscess.

There are some cases, however, which in spite of all treatment continue to get worse and worse, the discharge from the sinuses becoming more profuse, the general health manifestly failing with the development of hectic symptoms: it is in these cases that the only hope for the recovery of the patient, with a useful limb, lies in operative interference.
* Erichsen's Science and Art of Surgery.
Section III

Operative Intereference.

In the treatment of hip disease there are three methods of operative interference, namely, Incision, Amputation, and Excision. The two former methods I intend only just to touch upon, the latter method I shall discuss more fully.

A. Incision.

When, in certain acute cases of articular hip disease, pus has formed in the capsule of the joint, it is advisable to incise the joint on its posterior aspect and evacuate the pus. Its presence only sets up further irritation and eventually leads to disorganisation of the joint.

Professor Amundelle advocates and has put to the practical test of experience this method of incision, and has obtained excellent results.*

Mr. Guy in a paper read before the Medical Society of London, and published in the December of 1856, strongly recommends free incisions into diseased joints; maintaining that the incision is made not merely to
evacuate any matter that may be present, but the purpose of allowing the more ready escape of cartilaginous or other debris. In the same paper he publishes an account of three cases of advanced hip disease treated in this manner. The first case was one of hip disease of three years previous duration, with swines about the joint, but very little discharge. The swines were relieve by incision, & the joint opened, recovery taking place in fourteen weeks. The other two cases were not so satisfactorily, as they ended as the first, as in both the cases fresh abscesses formed and burst on front of the thigh.

The incisions should always be made with strict antiseptic precautions, as far as possible; and should be exploratory, as far as the condition of the joint goes. The incisions are not prejudicial to the after performance of section.
B. **Amputation.**

Under certain circumstances amputation of the limb for advanced hip disease is justifiable, but owing to the serious nature of the operation, the amount of shock attending it, and the high rate of mortality, it is rarely resorted to.

It should here be performed until arthrosis has been tried and failed.

If after resection of the joint, the discharge from the sinuses continues to be still copious and evidences of abscess and degeneration of the ischia supervene, amputation is justifiable.

If after resection, osteomyelitis and acute necrosis of the shaft of the femur occurs, as it occasionally does, amputation is justifiable.

If after resection, the result is not satisfactory as regards the usefulness of the limb, and the limb is an incumbrance amputation may be proper.
* Translation of Paulus Aurelii by Francis Adams, published by the Syracuse Society.

p. 396

† Haverso paper published in the Medical Times and Gazette for 1872, vol i.
C. **Excision.**

**History of the operation.**

Pand of Aegina* appears to have been the first surgeon to recognize the propriety of excising diseased portions of bone. "If he says," the fistula terminates with a bone and if it is caninus or otherwise corrupt, the whole diseased portion is to be cut out with counter perforators", and later on in his article on "Fistulæ and Tauri," he goes on to remark: "In like manner, the extremity of a bone near a joint, if diseased is to be sown off, and often if the whole of a bone, such as the ulna, radius or the like be diseased it is to be taken out; but if the head of the thigh bone or pelvis be diseased, we must not attempt to operate, for fear of the adjoining arteries. Since Pand of Aegina recognized the possibility of excising the hip joint for disease, there appears to have been no recorded case until Schuwald, a German, in the year 1816 removed the head of the thigh bone. The case in which he operated on was one of advanced hip disease of some
* Cases of Surgery: ete by Charles White,
Manchester 1770. p. 66.
year's duration, dislocation on to the dorsum of the femur had occurred, with seisms about the joint leading down to diseased bone. The child's health was rapidly failing, so Schwalbe determined on removing the head of the femur by operation. He accordingly made an incision over the distal end head and found the upper part of the femur lying loose on the dorsum. He required neither bone forceps nor saw, but by means of a strong pair of pincers he extracted it, there being very little haemorrhage. The girl recovered.

This is the first recorded case of dislocation. Previous to Schwalbe's operation, however, it had been proposed by Charles White of Manchester in 1769, for he observes in his "Cases of Surgery", I have likewise in a dead subject made an incision over the external side of the hip joint and continued it down below the great trochanter, when cutting through the gluteal ligament and bringing the knee backwards, the upper end of the os femoris has been thrust out of its socket.
Hancock's paper, Medical Times and Gazette, 1872.
"and easily sawn off; and I have no doubt" "but that this operation might be performed" on the living subject with every prospect "of success." There is no evidence, however, that he afterwards performed the operation.

Mr. Anthony White, of the Westminster Hospital, was the first British Surgeon to perform this operation. In 1821, after consultation with Mr. Travis, he seized the head and neck of the femur for advanced hip disease of three years duration. The patient (a boy) was much emaciated and pulled down by the supraspinous discharge from three abscesses about the hip. A straight longitudinal incision was employed, and the bone sawn off below the trochanters, no difficulty being encountered, and very little blood lost. The round ligament and cartilage were destroyed, and superficial caries of the head of the bone was present, but the bone had not lost much of its original shape. At the end of a year he had recovered, with a comparatively useful joint and limb. He died five

* Oppenhein's Zeitschrift, vol. i.

years after of pulmonary phthisis, the foot taken away after death being preserved in
the museum of the Royal College of Surgeons.
A false joint had formed, the resected end
of the femur being secured but firmly
fused to the ileum by a strong capsule
of ligamentous tissue. Mr. White's case
was subjected to a great amount of
opposition and criticism, but notwithstanding
the complete success of the case, it does
not appear that at any future time did
he repeat the operation.

Hawson of Dublin seised the head and
neck of the femur for advanced hip disease,
the bone being divided above the small
trochanter. The patient died three months
afterwards from profuse suppuration, the
acetabulum having become perforated with
the formation of pelvic abscess.

Carmichael operated on a young woman for
medullary sarcoma of the thigh, but she died
next day.

Oppenheim and Sehrt both seised the
head of the femur for gunshot injury, but
their efforts were unsuccessful.
†. Lepold F. Über die Resektion des Hüftgelenkes

gießenburg. 1834.

Tracto operates three times, once for fracture of the neck of the femur, and twice for caries of the head and neck of the bone, but none of the cases were successful.

Hume, Dugue, Vogel, and Stellot also operated about this time.

After White's and Hewson's cases, the operation seems to have been entirely forgotten in England, and it was not until in 1845 that Sir H. Ferguson resuscitated it. * Ferguson's first case was the severe suffering from advanced hip disease with profuse suppuration, shortening of the limb, dislocation on to the femur, in fact all the characteristic signs of advanced hip disease. The operation was performed on the 1st March 1845, and was very successful. A longitudinal incision about six inches long, was made in the line of the femur, and after having separated the soft tissues from the shaft of the bone, a chain saw, after some difficulty, was passed round the bone. This eventually broke, compelling Sir
William to adopt some other procedure. The soft parts about the neck and back were then divided, and by means of abduction, etc., the head of the bone was extended through the wound sufficiently to enable him to divide the femur with an ordinary saw. About four inches of bone were removed, the articular cartilage being almost entirely removed from the head of the bone together with superficial areas of the demineralized part. The case did well. The boy soon regained his strength and all hectic symptoms disappeared. Eventually he made a good recovery, the result being most satisfactory.

Sir William Lister's operation led to considerable amount of discussion and was subjected to a great amount of adverse criticism at the time. Sir Fredric Stone, Mr. Syme, and Mr. Stuy, together with many other surgical surgeons, were strongly opposed to the operation, because of the blood and formidable nature and because of the possibility of spontaneous
* Hancock, above cited.
Since then, however, the operation has grown in repute and has become a recognised operative procedure in certain cases of advanced hip disease.

It was not until 1857 that what may be called true resection of the hip joint was performed, as before that time surgeons confined themselves almost exclusively to the removal of the head of the femur, often with the pelvis. Hancock was the first British surgeon to remove not only the head of the femur but portions of the pelvic bones. Since 1857 the operation has been many times performed, and is advocated by many eminent surgeons as a justifiable operative procedure.
8. Indications and Contraindications.

Whereas the hip is the seat of disease, incurable except by the surgical operation of removal, to save the limb by the partial operation of resection of the part, instead of sacrificing the whole limb by amputation, should ever be one of the principal objects of the surgeon. Bearing this in mind, there are certain cases of advanced hip disease in which the operation of resection is justifiable and indicated. I propose, therefore, to go over the several indications justifying this operation, and then to point out the contraindications.

Indications

1. To save life. In some few cases of advanced hip disease, the patient's constitution becomes thoroughly undermined by the excessive suppuration and discharge, fatal hectic symptoms develop and unless something be done to remove the carious or necrosed portion of the bone, which is the source of the irritation, the case will end fatally. It is in these cases the operation is most impracticably indicated.
In advanced stages of femoral coxalgia, with functional inutility of the limb, as a result of destruction of the articular cartilage, without the superinfection of anthrax. The head of the bone in these cases will be found to be carious or even removed, lying on the ilium, with sinuses round about the hip leading down to extensive bone and discharging profusely. The pelvic bones are healthy and the cavity of the acetabulum lying by a soft fibrous tissue. The limb is shortened and adducted, the thigh acutely flexed on the abdomen and the limb functionally useless. If nothing be done in these cases, in all probability, they will end fatally, or if they do recover after years of suffering the limbs will be shortened and adducted in bad position and altogether useless. Dislocation of the head of the bone on to the ilium is very bar to the operation but facilitates it. At one time the operation was not considered justifiable unless dislocation had occurred. For instance
* Dr. Henry Smith on suspicion of head of the femur for Carries. of the Hip joint
       done at. March 25th. 1848.
*Mr. Henry Smith in 1848 laid down the following rules: "The disease must be in its last stage; it is necessary that dislocation of the thigh bone from its socket should have taken place; and there must be evidence of the disease being confined chiefly to the upper part of the bone, and of a non-inflammation to any great extent of the pelvic bones." Now, however, the presence of dislocation is not considered a necessary symptom, although it greatly facilitates the performance of the operation.

In early stages of femoral coxalgia, where rapid ulceration and destruction of the femoral articular cartilage occurs, followed by superficial caries of the head of the bone, with suppuration within the capsule of the joint and considerable constitutional disturbance, the operation is justifiable, if after an exploratory incision the above condition be found. Formerly, trepanning was only performed in the advanced stages of the disease, and it is to Armidale we are indebted for having...
pointed this out as an indication for section. The successful result of Case vii. also, bears this out, the performance of the operation being followed by almost immediate relief from the Terrifying pain and great improvement of his constitutional condition. Early section is also required in those cases of acute epiphysitis leading to necrosis of the head of the bone.

iii. In acetabular epiphysitis, where the hips and cavity of the acetabulum are diseased, and where perforation of that cavity occurs with the formation of intrapelvic abscess, the operation is indicated. Previous to 1857, any disease of the acetabulum or pelvic bones was an insuperable barrier to operation, but Hancock in that year maintained that the presence of acetabular disease was no contraindication but rather an indication for section. Since 1857 large portions of the pelvic bones have been removed for disease with very good results.
In certain cases of femoral acetabular fractures, the disease spreads to the acetabulum, producing ultimately secondary perforation of that cavity with the formation of interpelvic abscess. It is in these cases also that the operation is indicated, even if it were only as a means of affording sufficient drainage for the pelvic abscess.

**Contraindications:**

i. **Anteplasty of the joint.** If anteplasty of the joint has supervened, the operation is not justifiable for the purpose of removing any malposition. As a rule, division of the neck of the femur, as recommended by Adams, will be found quite sufficient.

ii. **Adult age.** Is a serious contraindication to the operation. A few cases of recovery after the age of 50 have been recorded.

iii. **Vascular Diseases,** in so far as they are incompatible with life or the powers of repair, contraindicate the operation. Several cases have however been recorded of recovery with chronic kidney and liver.
Disease. In case viii, where there were all the signs of incipient phthisis, the cough and night sweats disappeared after the operation.

x. Methods of operating.

The different methods of operating all depend on the primary incision which is employed, as the procedure after that are essentially the same in all cases.

i. Simple longitudinal incision. This was the method adopted in all the above cases, and it was found to afford ample room for the further performance of the operation. If sinuses be present on the outside of the hip, a director may be passed down to the head of the bone and the knife directed along its groove, freely incising the tissues on the head of the bone. The extent of the incision will vary according to the position of the capital femoris and the extent of pelvic mischief. As a rule, an incision from 2½ - 5 inches in length is quite sufficient, two thirds of the incision being made into the glutei
# Eichens Surgery, vol ii, p. 466.


†. Hamburg Ztschrift, vol i, part ii

muscles above the trochanter and one
third over the great trochanter.
Oppenheim, Suetini, Fernandez, and
Langenbeck adopted this method.

ii. By a T-shaped incision. This is a
method which is also very often employed,
the object being to get as much room
as possible. The lower end of the cross
end of the T, affords a much more
dependent drainage, than when the long-
itudinal incision is used.

iii. Samihman incision advocated by
Sappe. The concavity looking forward.
Sappe maintains that it especially applicable
in those cases where there are no reasons
to interfere with the incision.

iv. By the formation of a flap: either
in the shape of a U, as recommended
by Peray and Roux, or by the form-
ation of a triangular flap, as recommended
by Jaeger.

v. Parker's method of reaching the joint
by an anterior incision which is made
in the interval between the Tensor ruminaci
florosi and the Sartorius.
recommends it to be employed in those cases only in which the head of the bone is alone dislocated and when it is not necessary to remove the trochanters. It is also especially applicable in those cases where the dislocation is pointing in that situation, and should never be attempted when there is perforation of the acetabulum and the consequent formation of intrapelvic access as it does not provide sufficient drainage. It should also never be employed when there is dislocation of the head of the bone backwards or to the Dorsum illii.

### The Extent of Bone to be removed.

There is a great diversity of opinion as to how much of the femur ought to be removed, that is to say whether the division should be made above or below the great trochanter.

The German Surgeons as a rule saw through the neck of the femur, and remove the great trochanter afterwards, if found necessary.

The British and American Surgeons on the other
* Archiv. für Klinische Chirurgie. 1870.

† "De la résection cœliaque pour Carie"
These de Paris. 1869.
hand adopt the method of dividing the femur below the trochanters.

There is no doubt, I think, that the removal of the great trochanter is never followed by a worse result functionally than were decapitation of the bone; and that by removing the great trochanter a much more efficient marriage is procured.

Statistics would also seem to vindicate the advisability of removing the trochanters, for Darwin, in his report on this subject showed that 51.7% of the cases recovered when the great trochanter was removed, while only 33.3% recovered when the femur was divided through its neck.*

Richard Good also arrived at the same conclusion as out of his 49 cases of secession of the hip 30 cases or 61.23% died when the division occurred through the neck of the femur. Out of 56 secession below the great trochanter, 37 only died or 40.21 per cent.†

Large portions of the acetabulum sometimes require gouging, and from the adjacent parts of the ilium, pubis, or ischium may require fixation.
Erichsen. vol. ii. p. 468.

†. Archiv für Klinische Chirurgie (1870)

8. Results.

There are two great points to be considered with regard to the results of secession of the hip joint for disease, namely:

i. The mortality immediately due to the operation.

ii. The ultimate usefulness of the limb.

The mortality immediately due to the operation.

The Clinical Societies collected the statistics of 203 cases, of which 29 or 13·7 per cent died. The deaths being immediately due to the operation.

Dr. Fischel of Hamburg collected the statistics of 176 cases of secession of the hip, and out of these 98 deaths occurred, but only half the deaths could be attributed to the operation.

24 or 13·6 per cent died from intercurrent disease such as pyemia, septicaemia. 14 or 8 per cent died in a fortnight from sepsis. 14 or 8 per cent died in a month from sepsis (amyloid disease and pleurisitis). 27 died from the beginning of the second month to the end of the year after the operation. 9 died in the course of two or more years.

Amsdendale operated 16 times, only three deaths occurring some months after the operation.

† death July 15 1871. Aug 5th 1871.

# Frieden, vol ii p. 468.
Eulenburg collected the statistics of 56 cases, 28 occurring in Germany, 21 in England, 1 in America, 1 in France, and 5 in Russia. Out of the 56 cases, 24 died and 22 recovered, while 7 were in process of care, 3 not cured.

In a paper on this subject given by Dr. Broggi and Mr. Hancock's statistics, tabulate those of Goods of America (112 cases) and deduce the three following general conclusions regarding the state of mortality:

1. In different countries a very different mortality, being highest in France and lowest in England.

2. An average death rate of 1 in 4 or 5.

3. Very different death rates in the hands of individual surgeons.

Croft, in 1887, published the statistics of 45 cases in 18 of which death occurred. Of the 40 per cent of deaths, 15.6% died directly from the operation, 13.4% from some form of circulatory disease, 6.6% from albuminoid disease, and 4.4% causes unconnected with the joint operation.

From the above statistics it will be seen...
Of the 42 cases that could use the limb, 19 could walk without support, 9 with the help of a stick, 1 two sticks, 1 a splint, 1 a crutch, 2 two crutches.

In 40, out of the 52 cases that occurred, the limb supported the body.
Therefore, that the mortality directly due to the operation is not so great as one might have supposed, considering the serious nature of the operation. Taking all the above statistics together, it will be found that the mortality directly referable to operation comes to less than 25 per cent of the cases operated on.

I am unfortunately unable to draw any definite conclusions as regards the rate of mortality in the above 8 cases, described in the first section of this thesis, as they have not been under observation a sufficient length of time, but the rate of mortality directly referable to the operation is practically nil at present.

ii. Ultimate usefulness of the limb.

Of Mrs. Dodge’s cases (iii) 52 occurred with a “more or less” useful limb.

Of Ford’s cases (iv) 52 occurred, 42 of these being able to use the limb.

Of the four cases that occurred, upon my own observation, the limb was useful, both crutches being required for some months after the operation through
In all the cases that recovered the joint was freely movable, fibrous ankylosis having occurred. The results of seision as compared with those cases of advanced hip disease which here underwent a spontaneous cure are very favourable. The limb in the latter case is as a rule firmly anchored in some bad position rendering it more or less useless as a means of progression. Whereas, after seision from seision there is as a rule a movable joint at the hip, the limb is almost always straight, and the period of suffering is very much diminished. Genuation of growth of the limb after seision is not very much, and certainly not more than in those cases of spontaneous recovery. Cudchels are as a rule required some little time after the patient begins to go about, but eventually the cudchels are cast aside and within a short or nothing at all used.
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