A Few Remarks on the Nature, Pathology, and Treatment of certain Diseases and Injuries which occur at the Hip Joint

(By)

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(1860)
It is my intention (1°) To give a short account of the Anatomy of the Hip joint. (2°) To consider the nature, Pathology, and treatment, of Chronic Absorption, affecting the neck of the Femur. (3) To describe the symptoms and pathology of the Rheumatic alterations, which occur at the Hip joint. (4) To give a description of the Fractures, which take place through the neck of the Femur, including an account of their symptoms, diagnosis, Pathology, and treatment. For I will endeavoured to show, that more than one, or all of these conditions, are occasionally connected with one another in the same case.

And also, that any one of these may be at times, mistaken for the other, owing to the similarity of certain of their symptoms. I have introduced into this Essay a few sketches, which, although roughly done may
yet tend to illustrate some portions of it, as all of them, have been taken from preparations, which I have had opportunities of handling and examining for myself. Most of the cases also, which I have related, have happened under my own observation.

It is not necessary that I should give a full description of the Anatomy of the Hip joint, but shall only state, that it is formed by the rounded head and a portion of the neck of the Femur below, and by the Acetabular cavity of the Os Ilium, above.

In the natural state, the rounded head of the Femur is firmly retained in the Acetabulum (which is deepened by the Cytoid ligament) principally by means of atmospheric Pressure, but at the same time, it is freely movable in almost all directions.

Surrounding the joint, is a strong Capsular
ligament, thicker in front than behind, which is attached alone, to the margin of the acetabulum external, to the那天roid ligament and a short distance beyond, the superficial fibres becoming blended with the strong periosteum, covering the external surface of the acetabulum.

Below, it is inserted, anteriorly, to the intertrochanteric line, and base of the neck of the femur, being strengthened on this aspect, by a band of fibres, running between the anterior-inferior spinous process and the anterior intertrochanteric line; this band is called the ilio-femoral ligament.

Posteriorly, the capsule ligament is also strengthened by a band of fibres, described by 'Weber,' these arise from the anterior inferior spinous process also, but have very oblique, backwards and downwards, so obliquely, that they do not become connected to the neck of the femur, but form a sort of
circle of fibres, which embraces the posterior part of the neck of the femur, as a collar, this causes a deficiency in the ligaments behind, through which, the synovial membrane often protrudes.

On cutting through the capsular ligament and exposing the interior of the joint, the cotylar and ligament will be seen, surrounding the margin of the acetabulum, and adding, to its depth, it consists of a ring of fibro-cartilage, attached by its lower margin, to the edge of this cavity and continued across the upper portion of the cotyloid notch, so as to complete the circle, leaving a space beneath it, for the transmission of bloodvessels and a nerve into the interior of the joint. The upper margin is free and embraces the rounded head of the femur. The ligamentum teres or round ligament will also be perceived, running between the base of the acetabulum and a depression on the summit of the head of the femur, it is attached by one extremity to the roof of
on the summit of the rounded head of the femur and by the other, which becomes turgid and flattened out, to the margin of the cotyloid notch, its fibres blending with those of the transverse ligament; it is composed of a strong band of fibres, covered externally by synovial membrane, it has also one or more arteries running along it, as well as certain veins, these aside in the supply of the head and neck of the femur, as will afterwards be seen; it varies much in thickness in different individuals and is liable to become atrophied and almost entirely to disappear, in certain diseased states of the joint.

The rounded head of the femur is covered, and the acetabulum is lined as by the ordinary articular cartilage, except at the corresponding depressions on each, for the attachment of the ligamentum teres.

The whole of the interior of the joint is lined by synovial membrane, which is reflected on to the ligamentum teres, and covers the
naps of fat, which fills up the depression, at the bottom of the acetabulum; below, the synovial membrane is reflected from the interior of the capsular ligament, on to the neck of the femur, where it invests that strong fibrous capsule, surrounding the neck of the femur (which was described by Sir A. Cooper) and forms certain folds with it. As this fibrous capsule is of great importance, in connection with fractures occurring in this situation, as well as with certain diseased states of the joint, (for I believe that it is often the seat of rheumatic inflammation and deposit in the articular cavities of the hip joint) I may be excused for giving a more minute description of it.

It consists of one or more layers of strong fibrous bands, varying very much in thickness, in different persons, it is perforated in several places, to allow the synovial
membrane to pass in and out of the foramina on the neck of the bone.
Anteriorly, these bands are continued up from the thick periosteum covering the anterior intertrochanteric line and surface of the bone external to it. The most superficial layer runs obliquely in the direction of the neck and is connected to the margin of the head.
Posteriorly, the superficial layer of fibres is continued up from the trochanteric fossa and from that strong band of fibres running along the posterior intertrochanteric line and internal to it; these also run obliquely upward and are inserted into the margin of the head of the bone. The deeper layers both anteriorly and posteriorly are not so long in their extent, but have a tendency to cross each other and partly encircle the neck becoming attached to the bone and to the margins of the foramina before mentioned, which
open on to the surface of the bone, in this locality.

This capsule, when it is well developed, must add very much to the strength and firmness of the neck of the bone.

The Hip joint is supplied with blood by means of branches from the Internal and External Circumflex branches of the Femoral. The Obturator Artery also frequently sends a small branch to the joint, several of these arteries enter the Bursa into the neck of the femur, for the supply of the head and neck of the bone.

But these structures have another important means of nourishment, namely, the Artery or Arteries, which are carried along the Ligamentum Teres, these are generally derived from a branch of the Internal Circumflex, which along with a nerve (a branch of the Obturator) enter the Gluteal Cavity, underneath the transverse ligament, one or more small veins...
Grasping and at the same place.

This latter mode of nourishment of the head and neck of the Femur is important, for in cases where the ligamentum naris becomes atrophied or altogether destroyed, these portions of bone are liable to become weakened in their structure from the cutting off of a portion of their supply of blood, and consequently, become more prone to undergo morbid changes.

And first of Chronic Absorption of the Head and Neck of the Femur.

This proces most frequently takes place in elderly people, and is generally the result of a bruise or fracture of the Hip joint. Bruises of the Hip, although occasionally mistaken, at the time, for more serious injuries of the joint, owing to the slight shortening or even lengthening of the affected limb, which is sometimes present after these injuries, are not generally serious in
their nature, except in the case of very old persons, who may die from the shock of this, as from that of any other injury; or, when the patient is of a weak strumous constitution, suppurative inflammation and the so-called Mollusca Carunculosa may result; or lastly, except when the accident is followed by chronic absorption, this generally taking place in patients, somewhat advanced in years.

Bruise of Hip joint, with lengthening of the affected limb; treatment by means of long tight Splints. (Cure).

Robert Mitchell, aged 55, admitted into the clinical wards of the Royal Infirmary, Edinburgh, under the care of Mr. Syme, Nov. 27th 155. A few weeks ago, patient got a severe fall on his left Hip, the joint swelled considerably, and he suffered a good deal of pain; he was seen by a medical man in the country, who after treating him with Rhenatations for a time
advised him to come to the Lyne for advice, owing to the lengthening of the affected leg, he thinking, that there might be some more serious injury of the joint.
At the Lyne on examining the joint, found slight swelling around it, patient could move the joint pretty freely, although it caused him pain, the limb appeared to be almost half an inch longer than its fellow, but on measuring it accurately it was found to be of the same length as the other, it was ordered to be treated by the application of the long splints and sheets, at the end of five weeks, patient having trace the splints applied during this time, returned home, with the limb, perfectly normal in every respect.

Case (2)

Bruise of Hip in a Scrofulous Lad, followed by Morbus-Coxarium.

2. Mr. Oct 14 applied to me for advice.
Sept 12 1579. Four years ago he fell among
Section of Hip joint, affected with Mucous Coxitis, showing absorption of the head of the femur, and partial fibrous ankylosis. (Anatomical Museum)
Some horses and bruised his right Hip, a short time after, he began to feel a pain in his Knee and Hip, this continued for nearly two years, when abscesses formed around the joint, these were opened and gave exit to large quantities of pus, the limb got shorter, and patient was very weak, this has been going on until the present time.

On examining and measuring the affected limb, it was found to be two inches shorter than its fellow, the knee and foot were turned outwards, and placed in advance of the other, the patient resting on his toes. The buttock of the affected side, is swollen and has several sinuses on it, which are still discharging pus, and which communicate with the joint. The trochanter major is lying much more posterior than natural, on attempting to move the head of the Femur, it is almost immovable, only allowing of slight flexion and extension.
An *Intercapital* Fracture
of the neck of the Femur, balanced
by absorption of the neck, so
attempted as union.

[Anatomical Museum]
[University]
Patient is very much emaciated, he has had very poor diet lately. Ordered, to take
macerating food, cod liver oil, and approp-
riations to the joint.
I have related this case very briefly, as it
is only intended to illustrate the consequences
which may follow a bruise of the Hip, or any other joint, in a Scrophulous Constitution.
I append a rough sketch, taken from a
similar case, the joint of which, I had
an opportunity of dissecting, after Patient's
death.

It will be afterwards seen that this process also
frequently follows intra-capsular fracture of the
neck of the Femur.
And in joints, which have suffered from Rheumatic
Arthritis, a bruise or other injury, will be very apt
to cause a renewal of the inflammatory attatch
and hasten on those peculiar alterations, which
are so often bound in the joints of Rheumatic
patients.
If therefore, gradual shortening and deformity should come on, in the limb of an elderly patient who has suffered a bruise or injury on the corresponding Hip joint, the affected limb shortly after the injury, presenting, no signs of any material diminution in length or position, we may be certain that serious changes are going on in the joint.

It is important that we should not give too favourable a prognosis, in such cases, concerning the injury, for what appears at the time, to be merely a simple bruise, may end in gross shortening and deformity of the limb, and if these changes should occur, the Medical attendant of the patient, may be accused of having overlooked the true nature of the injury.

This affection, consists, in a late and chronic form of inflammation, followed or attended by interstitial absorption of the neck of the Femur, thickening of the capsular
Fusion of the head of the Femur
from absorption of the neck.
Absorption and alteration in direction of the neck of the Femur, the disease encroaching also on the head of the bone.

Anatomiens Museum
Univerit
Alteration in direction
of head and neck of Femur,
from a case of Rickets,
causing the absorption of the neck
of the bone.

Chen's Chester College Museum
Alteration in the direction of head and neck of femur, in a case of Rickets, from absorption of the neck of the bone.
Shortening of the neck of the femur, from Absorption

(Posterior View)
Head and neck of Femur, from an old person, showing the longitudinal direction of the neck. Section of the same, exhibiting the extreme thinness of the External Plate of bone, at the neck, with absorption of the cancellate structure, at the same situation. (Private Anatom.)
Section of the head and neck of a femur, affected with chronic inflammation, showing both absorption and condensation of the bone textures.
Section of the head and neck of a Femur showing shortening of the Medea from absorption, and condensation of the bone tissue, extending across the neck, simulating a united Intracapsular Fracture.

Anatomiæ Museum (University)
ligament and very frequently atrophy of the ligamentum teres.

This absorption proceeds, causing the neck of the femur to be entirely altered in its direction, as regards the head of the bone, and if the disease be not checked, in some instances, advancing, till there is actually no neck remaining, the head, centring, so as to come in contact with the trochanters or shaft of the bone.

If a longitudinal section be made through the head and neck of a femur, thus affected, it will be found that the bone, in some places is much denser than usual, this dense area, extending into the cancellated tissue, whilst in other portions, the naturally dense bone, has become much thinned, and the cancellated portion deficient, their meshes being much larger than usual.

The latter of these appearances, is most common, but I believe, that both these conditions may exist more or less together, in the same case.
What then, is the cause of this disease?

In all the examples of this disease, which I have had opportunities of dissecting, the capsular ligament has been thickened and lined on its interior, by a thin vascular membrane, from which processes passed into the sheath on the neck of the femur.

The ligamentum teres is generally very much atrophied, being often reduced to a mere band of fasciculus or synoviae membrane.

On holding a longitudinal section of the head and neck of the affected bone into water, the meshes of the cancellated bone are seen to be filled with the remnants of a delicate vascular membrane, which is readily washed away, by allowing a stream of water to fall on the section.

The pericapsular sheath, surrounding the neck of the femur is thickened in some places, atrophied in others.

It is probable therefore, I think, that the bruise or injury, is balanced by a certain amount of inflammatory process in the
Squamous Membrane, and in the Membrane, lining the long canals, in the interior of the head and neck of the bone, that as a result of this, there occurs excavation of elastic material, which becoming organised and vascularised, forms the Balse Membrane, in the internal aspect of the Squamous Membrane, covering the Capsular Ligament, and in the long canals of the head and neck of the bone, that these membranes become connected, forming the Processus, which enter Foraminae on the neck of the Femur.

We have seen that the head and neck of the Femur derive their nourishment from two sources, Namely, by means of Blood vessels conveyed along the Ligamentum Tarsi, and by means of others, entering the Foraminae on the neck of the bone.

Now, in joints affected with this absorptive process, the first of these supplies is entirely cut off and the second to a certain extent
weakened by the results of the inflammatory attack.

Therefore, the tissues comprising the head and neck become only feebly nourished, and we well know, that when any tissues becomes at all impaired in its vitality, it is liable to be eaten up, or absorbed by the surrounding more healthy structures.

Mr. Lister (in his lectures on Surgical Pathology) has shown that after exciting a focus foot, the pigment cells, which forms less vitality than the surrounding tissues, become absorbed.

I am consequently of opinion, that portions of the neck of the femur, becoming weaker in their vitality, owing to defective supply of blood, and to the irritation of the bone membrane, the results of the inflammation are cut up, or absorbed by surrounding more healthy portions.

It is also a fact, that in consequence of any irritation, such as a Furuncle or Sequestrum,
the bone, surrounding such irritation, becomes more condensed than usual; this may explain how these two different states of the bone, are occasionally, met with in the same case, namely, Absorption and Condensation.

It has been shown by Jones and De Morgan, in a paper in the Philosophical Transaction for 1853 Page (117). That absorption of the older portions of the bone and production of new portions in their place, is constantly going on, and in Page 135 of the same paper, that this absorption is a much slower process, in the actual bone, than in bone, developed from Cartilage, or in the young subject.

May we not therefore suppose, that any cause or causes which may interfere with the natural processes of absorption of old, and production of new bone, should give rise to an increased or diminished action, of either one or other of these conditions.
The same author has written a small book of poetry called "Knights in Ireland's civil wars."
and thus constitute a disease.

By what means, is this absorption affected? Professor Goodeve (Anatomical and Pathological Observations, page 64) has shown that when absorption takes place in bone, the corpuscles of the bone increase very much in size; the nuclei, become very numerous, the at least the affected bone, is converted into a soft bony mass.

Professor Rinchoos (in his Cellular Pathology) afterwards described the process to occur in bone, the same as in the other tissues. Namely, that the bone corpuscles increase in size, the nuclei become very numerous, and come at last to be the true corpuscles.

The weakened portions of bone, in the neck of the femur will undergo this change, becoming converted into a soft bony matter, which is taken up, by the surrounding muscles; it is not yet determined, what class of muscles perform this office.
Showing the application of the long thigh splint and sheet.
How are these cases of absorption of the neck of the femur to be treated?

When the disease has once commenced, it unfortunately, admits of very little treatment. But much may be done in the way of prevention.

All injuries and bruises of the Hip joint, especially when they occur in elderly people, or persons of a weak and sthenous or rheumatic constitution, ought to be carefully attended to.

The best remedy is to apply the long thigh splint and sheet, which is the only means of keeping the Hip joint perfectly at rest, in ordinary bruises, this splint ought to be kept on for three weeks, a month, or longer, if it is necessary, if there is much uneasiness or swelling about the joint, warm fomentations may be applied.

If however, serious symptoms should come on, little can be done except the
Great thickening and growth of bone around head of femur the result of chronic inflammation.
continuance of absolute rest of the joint and avoidance of any source of irritation, constitutional or otherwise.

It is not to be supposed, from the above remarks, that all cases of chronic inflammation, of the Hip joints, are followed by absorption of the neck of the Femur. Far from it.

For other changes are found to occur after this chronic inflammation, not only the numerous alterations, which in (Patients of Rheumatic Constitution), are so commonly met with, but even an increase in the size of the Head and neck of the Femur, sometimes takes place, and corresponding changes in the Trochanters, accompanied by an abnormal direction of the neck of the bone, giving rise to a considerable long tumour in this situation.

I have not had an opportunity of dissecting a case of this kind, having only examined...
any specimens of this affection, but there can be no doubt, that it is produced by some cause of irritation in the particular portion of the bone.

(23) The Rheumatic Affections of the Hip Joint.

The term, Rheumatic affection of joints, is used by some authors, rather indiscriminately, for certain of the affections of the Hip, and other joints, are attributed to the results of Rheumatism, when they have really no connection with that disease; at the same time, Rheumatic diseases of the joints are very common and although, they may exist in several forms, yet I think, most of these are only different stages, in the progress of the one complaint. Rheumatic inflammation or Rheumatic Arthritis, as it is termed, may give rise to most of the similar conditions, usually described, namely, to Synovitis, ulceration of cartilage and even of the bone, absorption and
increased growth of bone.

But the Rheumatic affections of the joints, are characterized by certain peculiar appearances peculiar to themselves.

These consist in the variety and irregularity of the shapes, which the articular extremities may undergo, as is exemplified in the Hip joint, by the changes in the head of the femur, by the various formations and deposits of bone and other materials, especially around the neck of the bone, and in connection with its fibrous capsule, and by that ivory-like substance, which is found on the articular surfaces of the joint, the so-called Peculiar deposit.

This latter appearance is not confined to Rheumatic affections, but is most frequently found in connection with them.

The symptoms of this disease, are thus described, by Dr. Adams, in Dr. Todd's Encyclopedia, under Hip, page 799.

Patient complains of stiffness in the joint.
accompanied by a dull boring pain, which extends down from the thigh, to knee; the stiffness is most felt in the morning, when the patient commences to walk, but the joint becomes more free, after exercise, in the evening, if much exercise has been taken, the pain is always worst, but it subsides on going to bed, the pain is also increased when the patient throws the weight of his body, on the affected joint, but if the surgeon presses troops gently on the head of the femur against the acetabulum, no measure is occasioned; the movements of rotation are lost, and those of flexion and extension are confined, if the place is placed in the horizontal position and endeavor to cause any movement of the hip joint, it causes pain, and at the same time, a peculiar elevation is felt. The limb is apparently shortened, from two to three inches, which is partly owing to the altered position of the pelvis, the
Sketches (14)

Shedles (14)

Rheumatic, a chronic inflammation of the hip.

Rheumatic Arthritis.

(Adams)
affected side being very much raised. The real shortening amounts, on measuring it carefully, to about one inch, the patient is very lame, the foot and whole limb being erect.

The malleus of the affected side is flat, the muscles of the thigh atrophied, the joint is larger and more prominent than usual, and long prominences may occasionally be felt around the joint.

One hip only is generally affected, but there have been cases in which both hips joints have been found to be thus diseased. Mr. Smith (in his book on Fractures and Dislocations) relates the case of the late Dr. Percival, whose hip joints had both undergone rheumatic alterations, they were exhibited by the late Mr. Galles, to the pathological Society of Dublin in 1839.

The following case is condensed from Mr. Adam account, in the Encyclopaedia of T. Todd, Vol. 2, Page 800.
Patrick Macken, Oct 77, Patilin, and groom.

For the last seventeen years, he has been unable to perform his employment in consequence of being afflicted with a severe pain in his right hip, from the first attack of which, he became lame and ever since, the lameness has been increasing, he has a few wandering pains in other of his joints, but his general is otherwise good.

He walks with great labour and pain, in the morning, his movements are stiff and confined, but they become free after taking exercise, in the evening of my care, during which he has reached much, the pain and stiffer legs are much worse. While he remains in bed, he rests on the affected hip and suffers no pain, except he turns suddenly round. When he gets up, and the entire weight of the body is on the diseased joint
the pain commences.
The severity of the pain varies a good deal at different times.
As he stands, he rests the weight of the body on the sound limb, the affected limb changes in front, and slightly across the other; it seems to be at least three inches short, but on careful measurement, the shortening is only half an inch.
He cannot flex the thigh, or the abdomen, and has scarcely any motion in the Hip joint. When we examine the joint in front, there is a pulsation, and the Trochanter major, is feel enlarged covered with asperous deposits.
The thigh is atrophied, on the affected side.
If we attempt to move the joint, in any direction, the motion is very limited, and crepitation is distinctly felt, the movement gives some pain to patient, but we may infer the trochanter major against acetabulum, without causing pain.
Having had opportunities of inspecting and examining a good many Hip joints affected with Rheumatic disease, in all its stages, I will give a description of the appearances, which I have generally seen in these cases.

If the disease has not advanced very far, and the more serious changes have not yet taken place.

1. The Capsular ligament is thickened, and denser in structure, and more adherent (by means of folds formed within the Fibrous capsule) to the neck of the femur.

2. The ligamentum teres seems to be undergoing a change of structure, and is shortened in most cases; the synovial membrane covering it is thickened, and the ligament is becoming atrophied.

3. The Fibrous Capsule, surrounding the neck of the femur, is thickened, firmly adherent to the Capsular ligament, and has often nodules of bone developed in
connection with it, owing I think, to the irritation caused by rheumatic inflammation and deposits in its tissues.

(4) The synovial membrane, both that portion, lining the capsule, ligament and acetabulum, and that covering the head and neck of the Femur and ligamentum teres, is thickness and if the joint is placed in water, fine delicate fringe-like processses, will be seen to hang from the surface of this membrane, most marked, opposite that portion of the bone or cartilage, which is undergoing any change in structure, either owing to the new deposits or to absorption and calcination.

(5) The capsule ligament is thickened, but not so efficient as natural.

(6) The neck of the Femur is shortened, and marked by nodules of new living material, especially round the margin of the head of the bone, and as
Rheumatic affection of head and neck of femur, showing alteration in the shape of the head and new bone deposits around the neck.
Rheumatic affection of the Head of the Femur, showing deposits of hard material around the Head of the bone and alteration in the shape of the rounded head.

(Newcastle College Museum)
Rheumatic disease of Hip joint.

Showing the Acetabular alteration in the shape of the head of the Femur.

(Anatomical Museum, University)
The head of the femur encroaching on the neck of the greater trochanter of bone along the margins of the rounded head and bartine absorption of the neck.

- Trochanter Minor.
- Process of bone from the neck and from the shaft of the femur.

Rheumatic affection of Hip joint, with a process of bone, graving and of the shaft, anterior to Trochanter Minor.

(Neacaster Colleges Museum)
Rheumatic Affection of Hip.

Showing a Perforated
State of Articular Surface of
Head of Femur, together with
Porcelainous deposit.

(Original in the Collection Museum of"

Sketch (19)

The trochanter major is more eroded in
shape and occasionally channelled by nodules
of bone covered by thickened periosteum,
especially at the posterolateral corner.

Perforated State
of Head of Femur.

Porcelainous deposit.

Nodules of new bone
structure.
we have before seen, in connection with the fibrous capsule.

(7) The trochanter major, is increased in size and occasionally marked by nodules of bone, covered by thickened periosteum, especially over the region of the cunea, or the trocels.

(8) The head of the Femur, at this stage, has not undergone any great change in form, but its roundness is not so well-marked, it having become more circular in shape, its diameter in the transverse or oblique direction of the neck being greater, than that in the perpendicular direction of the shaft of the bone, so that the head has the appearance of being lengthened, as if it had been subjected to a rolling and vector.

(9) The acetabulum has not as yet altered much, the synovial fluid is diminished in size, and the bottom of the cavity is
Rheumatic affection of Head of Femur, showing alteration in its shape and large dehiscence around neck. (Anatomical Museum)
Peculiar alteration in the shape of head of Femur from Rheumatic disease.

(Anatomical Museum
University)
Alteration in the shape of
Head of Femur owing to
Rheumatic disease.
Alteration of Shape in the Head of Femur (from Rheumatic Disease).
consequently to a certain extent 'lace' bare.
As the disease advances, these changes become
more strongly marked.
The ligamentum teres becomes atrophies

to a mere shreds.
The head of the bone undergoes a greater
change in form, assuming in some cases,
a more or less Conicale shape, whilst
in others it is flattened or may have
almost any shape.
The neck of the bone, is correspondingly
affected, generally more or less, shortened,
but not always, the bone deposit is
also increased and appears to be of a
former Consistence, than before.
The acetabulum becomes deepened, and its
cavity altered in order to suit the change
of form in head of the femur.
More or less, of the Articular cartilage
disappears, it generally becoming first
destroyed, around the attachment of the
ligamentum teres, to the notch, on the head

Sketches
(20), (21),
(22), (23)
of the femur.

In the place of the articular cartilage there appears a smooth ivory-like deposit, the so-called Porcellaneous substance.

And now, what is the cause of these different changes which occur in a Rheumatic Hip joint?

There is no doubt that the Primary cause of the disease, is Constitutional, Namely, the Rheumatic Inflammation of the joint, and from secondary attacks of this inflammation (occurring partly to the consequences of the first attack, partly to the Patient's pre-disposition, and partly also, to the almost constant movements of the affected structure) a low and Chronic Inflammatory Process, or rather, an abnormal condition, in the nutrition of the cartilage is produced.

And that these changes are the results of this condition and its consequences. Let us next examine a little more minutely some of these Morbid Changes.
And first, why does the head of the femur undergo such variation in its shape, in these cases?

Professor Goodall, in his lectures 1858-59, described the Hip joint, in the human subject, sometimes to resemble that of certain of the lower animals, in being a true hinge joint, as regards its movement, of Flexion and Extension, the ligamentum teres acting as an internal lateral ligament, and the ilio-femoral band, as an external, lateral ligament.

One knows that nature has wondrous power in adapting living structures, long, and otherwise, to suit any change of function, or position.

I therefore hold, that owing to the abnormal condition of the different structures, connected with the Hip joint, which results from the Rheumatic disease, the movements of the joint become limited, and as a consequence of this
the head of the Femur, turning principally, in one direction only, if, as it were, rolled and or moulded to that particular shape, most convenient for its limited action. The long deposits, which form round the head of the Femur, are the chief agents in causing this limitation, for they prevent to a great extent, rotation both outwards and inwards, as well as Abduction and Adduction; Flexion and Extension also become lessened, as disease advances, if a greater deposit of offensive material takes place, and it is this, that gives rise to the Peculiar Achene and walk of the Patient, owing to the great interference with the normal Mobility of the joint, the head of the Femur being only able to turn in one direction, this direction, varying, in its course, according to the situation of the new deposits, and in its extent, to the greater or less amount of the same. The action of this Mechanical Cause is
well seen in some early cases of this disease, before the cartilage has become at all affected.

The head of the Femur permits of free flexion and extension, but, owing to the deposits round its margin, the other movements are interfered with, and as a consequence of this, the head becomes elongated and more irregular in shape.

I may mention, that I have always found the deposit of bone material to exist, as one of the first pathological changes which occur in the joints, even before the slightest alteration in the form of the head of the Femur, has taken place.

A second cause of this limited movement, is, the thickening and firm adhesion to the neck, of the Capsular ligament.

Once, a third cause, which is occasionally found in these cases, is, a shortened and contracted state of the ligamentum teres, before it becomes atrophied or disappears.
In the second place:

What gives rise to the peculiar bony deposits in this disease, which are found surrounding the head and neck of the femur?

Robinovitsky regards this process as an inflammatory rarefaction of the bone, which after furnishing an osseous excrescence terminates in induration.

Mr. Adams believes this process to consist of:

1. An hypertrophy of the Articular Cartilage, generally occurring at the circumferential margin of the head of the femur, but occasionally taking place towards the central parts of the Articular surface (2). In a development of time, osseous tissue, in the hypertrophied Cartilage, the osification commencing, either in newly formed Cartilage, or at the junction of the new with the old Cartilage. (Pathological Anatomy by Dr. Jones and Sturkings)

I believe that these bony nodules, which are generally covered more or less with Cartilage
are produced in the same manner as an Exostosis.

The Rheumatic Arthritis, being accompanied by more or less excitation of Plastie material, that portion of it, connected with the bone or Periostium, is converted into a Cartilaginous mass, this mass, becoming gradually ossified, the ossification commencing at the bone and proceeding upwards, so that the bone matter is covered by a layer of Cartilage of varying thickness. (See a Paper by Our Leader, on Ossification, in the Monthly Journal for 1854.)

I also think, that those peculiar delicate villi of the Synovial Membrane, which are found in this disease, are always in connection with those parts, where the above deposits are taking place. Also formed during the inflammatory attachment, the Plastie material, thrown out by the Synovial membrane, becomes organised and
Porcellanous deposit on
the head of the femur and
in the acetabular cavity. (Private Museum)
Debulked.
At first these cells may be the means of forming manuscritments, the cartilaginous deposits, lead, as ossification goes on, these cells become atrophied and are often found to consist of mere shreds of synovial membrane.

Finally, the smooth--looking white substance, which is known to occupy the place of the absorbed cartilage, has been called Perlecanum deposit. When first formed, it has numerous pores on its surface and appears to be merely a calcareous matter, infiltrated into the superficial layer of the bone, and this on being exposed to the constant friction of the two rubbing surfaces of the joint, becomes, as it were polished or ground down, and in this condition, is a tolerable substitute for the Articular cartilage.

Is there any treatment which can be of service in these rheumatic affections of the Hip joints?
Unfortunately, when these peculiar changes have once commenced, no treatment has as yet been known to cure the disease, as all, therefore we can do is to alleviate as much as possible the unpleasant symptoms. This will best be done by means of rest, anodyne and warm fomentations, and protecting the joints from cold or injury. Mr. Smith, in his book on Fractures and Dislocations, page 127, recommends anodyne fomentations, protecting the joint with wood or plaster, and the long-continued use of to chloride of Boroaphen and Calomelum; in small doses he has found beneficial, the laurel, also, are to be used often.

All these means of treatment, however, are most useless, before these serious changes have commenced, and when the inflammatory attack is present, in its more acute stage.
Fractures of the Neck of the Femur.

The neck of the Femur may be Fractured.

1st. Entirely within the Capsular Ligament; the Intra-capsular Fracture.

2nd. Altogether External to the Capsular Ligament; in these Cases the Trochanters are always more or less implicated in the Fracture, especially the great Trochanter.

3rd. Partly internal, Partly external, to the Capsular Ligament.

4th. There is a variety, which may occur in connection with any of these Fractures, namely, the Impacted Fracture, under the upper fractured Portion, is driven into the Tissues of the lower Fragment.

The Femur may also be Fractured immediately below the Trochanters, through its Shaft, or the great trochanter may become detached from the bone.

It is however, only my intention to consider the first four varieties.
Sketch (259)

Line in which section is made.

Head of femur, showing shortening and alteration in the direction of the neck to a slight degree, from interstitial absorption.

Section of the same, made in the direction of the neck, showing interstitial absorption, causing obliteration of structure of the cancellated matrix and consequent narrowing of the neck of bone.
The intra-capsular fracture.

This is an accident, which is very common, it generally occurs in old persons, or in patients, just the middle period of life, and more often in females than in males. Why should this accident principally take place in elderly people?

There are several reasons for this:

1. The direction of the neck of the femur, in old persons, becomes altered, being placed more horizontal and almost at a right angle to the head, the trochanter major is also much more prominent, especially in females.

2. We have before seen that the neck of the femur is very liable to become weakened, in its structure and undergo diminution of its substance in old people, and in some cases it appears to be affected with a sort of fatty degeneration.

3. The muscles and fat surrounding the hip joint become diminished in bulk.
and thus leave the joint more exposed to internal injury.

(4) Elderly Patients. Falls, they generally do so more heavily, for they are not so able to break their fall, with their hands and arms, or otherwise afford themselves. The following conditions, met with in older people, may I think, explain the reason why, according to the degree in which they exist, so, there will be a greater or less tendency for the fracture to take place. This fracture is almost always caused by a blow or fall on the trochanter major and this is the reason why old persons, and especially, females are liable to this accident.

A very slight injury is often sufficient to cause this fracture, a fall from a chair or bed may do it. Perhaps the most common cause is a fall from taking a false step in the street, or in going up or down stairs, and it may occur as the
reduced of any force applied to the great trochanter.

Case (4) Margaret Paterson, aged 76, admitted into the clinical ward of the Royal Infirmary, Edinburgh, under the care of Dr. Syne, Jan 29, 1854.

Patient fell in the street, upon her right side, on attempting to rise, she found she could not walk or stand and was immediately brought to the hospital.

On examination, it was found that the right femur had sustained an intra-
capsular fracture, the affected limb was one inch shorter than its fellow, and very much everted, on drawing limb down to its normal length and rotating, crepitus could be felt.

The long thigh splints were applied, but patient became so restless and slightly delirious that it had to be removed.

The following day, the limb was arranged and supported by means of Jillians.
Patient complained of a little pain in the foot on one leg, but otherwise was tolerably comfortable. She remained in the Hospital for about a week, and was then removed by her friends, who thought that she could be treated as well at home.

Case (5)
L. K. Oct 70, a female, sent for a Surgeon in the North of England, having fallen from her chair, on being taken up, it was found that she could not stand. On examining the right limb, it was found about half an inch shorter than it. Pelleau, was hatched. The limb was carefully arranged on a mattress, but severe constitutional irritation followed the injury, and she sank, and died in a few days.

On examining the joint, after death, the neck of the femur was found fractured transversely, entirely within the capsule, the Bilveran capsule was partly torn.
Fracture through the neck of femur within the capsule, showing portion of the fibrous capsule still uninjured.
though I cut, a few of the ribs, still remained whole, and assisted in retaining the fragment, somewhat together. I had an opportunity, in summer, of examining the joints and have given here, a rough sketch of it (Sketch 26)

Case (6)

Robert Forbes, aged 85, admitted into the Clinical wards of the Royal Infirmary, Edinburgh, under the care of Dr. Syme.

Act 22nd 1857. Patient had fallen whilst going up stairs, and injured his left Hip. On examination of the injured limb, there was no shortening or elevation, but there was great swelling around the joint. About ten days after his admission, the swelling, having somewhat subsided, on again examining the limb, it was found to be nearly one inch shorter than its fellow and the foot was evverted.

The constitutional irritation prevented the application of splints, warm fomentations,
were applied to the joint in an adrinkin,  
and the limb arranged on a mattress.  
Patient commenced to grog his urine  
involution, became delirious, lashing  
sore bones on his back, and he gradually  
sank and died on the 6th of Dec. 159.  
There was no surgeon examined.  
I might relate many more similar cases,  
but these three will suffice to illustrate  
this accident.

It is occasionally difficult to detect this  
accident, owing, (1) To the very slight alterations,  
which may take place in the position and  
length of the affected limb.  
(2) To the amount of swelling, which  
may exist, around the joint, the result of the  
accident.  
(3) The difficulty of obtaining time  
observation, it being impossible in some  
cases, to bring the fractured portions into
Fracture through neck of femur.
(Sir A. Cooper's block)
affection with one another.

The usual symptoms of this fracture are,
(1) More or less shortening of the affected
limb, generally from half an inch to
one inch.

(2.) Eversion of the foot and toes
although in some few cases, this does not
take place, but even inversion may
be present.

(3) The trochanter major is felt higher up,
than usual and is more moveable.

(4) On rotating the joint, pain is felt
by the patient, but there is no crepitation
to be heard, until the limb is extended,
and then on rotating, in most cases,
crepitation will be distinguished.

(5) On extending the affected limb, it
can be made of equal length, as it follows,
and when extending, it is withdrawn,
it becomes again shortened, as before.
The symptoms of this accident, however
may vary much in degree, according
Fracture of neck of Femur
internal to capsule with
partial absorption of neck.
Fibrous capsule almost entire.
to the extent of the fracture, though the
dense and, according to the injury sustained
by the fibrous capsule, surrounding the neck,
we have seen that the capsule is of
considerable strength, and therefore it tends
to keep the fractured portions of bone
together, if it is not itself, much torn
through.

Mr. Guthrie was the first to describe the
occasional symptom of inversion of the
bone, in fracture of the neck of the femur,
but he thought that it only took place
when the fracture was external to capsule.

Mr. Syme relates a case in the Edinburgh
Medical Journal for 1826, where this symptom
was present, and on dislocating the joint,
after patient attention, a fracture was found
to extend, though the neck and trochanter,
external to capsular ligament.

Mr. Stanley relates a case of fracture of the
Vol. 13 page 508, in which inversion
was foreseen, the patient died shortly after, and on examining the joint, the fracture was found to be entirely within the capsule. Mr. Smith, in his book on Fractures and Dislocations, page 22, mentions, that he has seen seven examples of inversion, following fracture of the neck of the femur, five of them, being external to capsule, the other two, being intra-capsular fractures.

The action of the fibrous capsule, surrounding the neck of the femur, is well shown in certain cases, where a patient advanced in years, having sustained a blow or fall on his hip, is carefully examined and found to have no signs of the fracture, but perhaps, in a few days or even hours, if a fair examination is made, he will be found to have all the distinctive symptoms of the accident. And this is explained, by the giving way of the fibrous capsule, which, at first, prevented the separation of the fracture.
Patients, and consequently hindered the signs of the accident, becoming manifested, the fixing way of the capsule may either be owing to a continuance or renewal of the force which caused the fracture, from movements of the joints, or from the strong contraction of the plastered muscle, which tends to draw upwards and slightly, anteriorly, the lower fragment.

If therefore, we should be called to see an old person, who has suffered some injury to his hip, and on examining the affected limb, we can touch only a very slight alteration in its position, and length, or, perhaps, no change at all, our diagnosis may be difficult, and our prognosis must be guarded. For in a few days, the symptoms may increase, in the one case, or only show themselves in the other, and even, if no fracture exist, the injury may be Ballanced, in some weeks, by the adaptive process, already before described.
Bruises of the H.J. joint have occasionally been mistaken for the accident, for they are sometimes followed by ligament shortening and eversion of the limb, and owing to the difficulty of detecting crepitis, in many cases of intra-\capsular fracture, it may not be easy to determine whether, or no, a fracture exists.

This is, however, of little consequence, as the same treatment is applicable for both, namely, perfect rest of the joint, which we have seen is best obtained, by the application of the long thigh splint and swathe.

On examining a joint, which has recently suffered from a \capsular fracture, there is generally a certain amount of blood extravasated among the muscles, and other soft tissues, surrounding the joint, the capsular ligaments being intact, unless great force has been applied. In opening the joint, a little blood is found in the interior, and if it be a day or two after the accident
Has occurred a little lymph will be surrounding the ligamentum tarsi and the broken fragments of bone, the neck of the bone, may be found fractured, either transversely, or obliquely, but when obliquely, generally involving the extra-capsular portion of the neck, as well.

The fracture may be completely through the substance of the neck or, only partially, and lastly, the Fibrous Capsule may be more or less injured, either completely torn through, or perhaps, scarcely at all affected.

If the joint be examined, several months, a year after the date of the injury, the capsular ligament will be found to be closely adherent, to the remainder of the neck of the Femur, the neck is more or less absorbed on both sides of fracture, the head of the bone, after partially absorbed, and modulated in appearance, in a few instances.

A greater or less number of ligamentous bands are stretching between the two fragments.
His joint exposed, by splitting up Capsular ligament, shame an intra-Capsular fracture of neck of Femur ununited.

A few fibrous bands helping between fragments.
Fracture of neck of Femur within the Capsule, with absorption of neck.
Intra-capsular fracture of head of femur, no attempt at union.

(Private Museum)
Fracture of neck of Femur internal to capsule with partial absorption of the neck.
Ununited fracture of neck of Femur, within the Capsule, with absorption of the neck.
these hands being often remnants of the fibrous capsule, and attached to the Capsular ligament, the ligamentum teres is sometimes, present sometimes, absent altogether.

The fibrous bands do not exist in all cases, the attachment of the Capsular ligament being the only bond of union between the broken fragments.

The Capsular ligament is occasionally more or less ossified, in fracture of its structure. The acetabulum does not undergo much change in its form.

In these rare cases, which are ballamed by of very union, there is very little alteration from the natural appearance of the parts, simply a thickening and more adherent condition to the neck of the Capsular ligament, a shortening of the neck of the Femur, and a line marking the track of the fracture. With increase of condensation of the of freight.

For, entire union does take place, it appears to be immediate, that is, it
in produced by the close apposition of the fractured ends of the bone and is not accompanied by much new specific deposit.

Osteous union of this fracture is so rare, that it has been denied altogether by some authors.

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Does intra-capsular fracture admit of long union?

Sir A. Cooper, in his Appendix on Fracture of the neck of the femur, page 3, gives a list of forty-three cases, in none of which union had occurred.

And although he had never seen osteous union follow this accident, yet he considered it to be quite possible, but extremely rare.

Dupuytren in his book on diseases and injuries of the bones, page 208, says, that after a careful examination of the specimens in the École de Médecine of Paris and in the Hotel Dieu, he has come to the conclusion, that long union of this fracture is demonstrated
Courvoisier. Sharp's union impossible.

In Langstaff, in the Med. Chin. Transactions, Dec. 13th, page 487, gives the history of several cases of fracture of the neck of the femur, within the capsule, and from the appearances of some of the dissections of these, he was induced to believe that union was impossible. Having in one case, seen union by very short ligamentous bands with defect of lymph anara ligamentum tarsi, and in another case, there was a sort of loose capsule round the fractured ends, formed by fracture of the capsule ligaments.

These were the nearest approaches to union he had ever examined.

Dr. Stanley, in the Med. Chin. Transactions, Dec. 13th, page 508, relates, a well-authenticated case of firm long union, the patient died of some other disease, some months after the accident, and on dissection, there was found...
firm of bone union.

Dr. Brunel, in Med. Chin. Transaction, vol. 13, page 513, relates the case of a James, who fractured the neck of his femur by a fall and of a gig. He died sometime after, of another disease, and on examining the joint, firm bone union was found to have taken place, the fracture being entirely within the capsule.

Mr. Adams in Todd's Encyclopedia, page 813, also gives a case in which firm bone union took place.

Mr. Smith, in his book on Dislocations and Fractures, gives a Table of Seventy-nine Preparations of Intra-Capsular Fracture, collected from Anatomical museums, and in only one of these had bone union occurred.

I have never felt myself, even a trace of bone union, after this fracture, although I have examined one or two preparations, which very closely simulated this union; these
being the results of Rheumatic Arthritis, or Chronic inflammation and absorption, and in which, a fracture had never been present.

There is no doubt, that these appearances have often been mistaken for united intra-capsular fractures. The appearances, found in these cases, consist of condensed bands of bone, of greater or less extent, which are found, running obliquely, across the neck of the femur and, as it were, continuations upwards, of the cortical layer of bone, surrounding the base of the neck.

If a section of a healthy head and neck of a femur be made, numerous their states of firm bone will be found to spring from the same situation and arch upwards, as if to support the head of the bone; these are more or less developed in different subjects. We may easily suppose that occasionally
when the neck of the femur is subjected to any irritation, such as Rheumatic Arthritis, or chronic absorption, these condensed plates of bone, may extend themselves, taking the place of the intervening cancellated tissue, either, by acting as points, along which living matter is deposited, or by actual increase of their own structure (see sketch 10).

Another appearance, which is sometimes seen in these cases, is a shortening and occasional distortion of the neck, caused by absorption of the cancellated tissue, and a sinking in, of the compact external shell of bone.

But, if these cases be carefully examined, they can scarcely be mistaken for aseptic union of an intra-capsular fracture.

For (17) an external examination of such simulating cases, the peculiar shortening, described before, and the deformity of the neck, will be different from the simple line or mark, which would indicate that a fracture
had taken place in that situation.

2. On making a section of the affected head and neck, the direction of the condensed osseous plates or line, will be found more oblique and to arise lower down, from the base of the neck, whereas, that, formed by a fracture, would be more or less transverse and correspond to the external line of fracture.

Osseous union therefore, of an intra-capsular fracture, does occasionally take place, under very favourable circumstances, namely,

1. If the patient's osseous system be healthy.
2. If the fracture does not extend entirely through the osseum, so as to separate the fragments, or if a certain amount of inspection takes place between the fragments, even if the fracture extends entirely through the osseum and its vessels remain uninjured.
3. If the fibrous capsule be uninjured.

But, in those cases where the fibrous
capsule is torn through, and when the fragments are separated, there will be no long union, there may be ligamentous union in some cases, but in the majority of cases the neck of the bone will become to a greater or less extent absorbed, the capsular ligament, adherent to the remaining portions and a few fibrous bands will be joined to run between the two fragments. This, forming a sort of false joint, which is never able to support the weight of the body alone, but which, with the aid of a stick or other support, used by the patient, may still enable him or her to go about a little.

Case (7) Mrs. B. Age 30, was seen by me Feb. 24 1860. Two years ago, she fell on her right hip, and sustained an intra-capsular fracture of the neck of the femur, it was treated by the application of the large splint for 7 weeks. After this, the splint was removed and she began gradually to
use the limb, it feels as if just any useless, but has been getting gradually a little stronger.

At present, the limb is erected and almost half an inch short, the joints in more or less, than usual, she can bear considerable weight on it, but cannot stand on it alone. When she rises from the sitting posture, she feels the joints painful, and weak, has occasionally a little pain in the back and leg and is able now to move about with a little support.

How, then, are these fractures to be treated? The best method, in the application of the long thigh splint and sheet, if the patient can bear it. A common long splint, should be placed on each side of the affected thigh and secured by one or two loops of bandage. These splints should reach, on the outer side
from the trochanter major, to the knee, and on the inner side, from the groin to the knee, they should be covered with cotton padding in order to prevent any exposure of bone. No continued extension is necessary in its early stages, it ought only to be used during the process of setting the fracture and applying the splint.

The system of using constant extension in this, and other fractures, produces aggragation of the pain, and I have seen not unfrequently severe sloughing of these soft tissues, around which these extending bands have been placed.

Mr. Syme, in the Edinburgh Medical Journal, vol. 3, page 292, speaking of the treatment of fractures, says: (1) That the great requisites for treating fractures success fully are Coaptation, and Immobility. (2) That extension, or a struggle between the two opposing forces, of muscular contraction and a mechanical power, is not
consistent with either of these conditions.
3) That therefore extenison should be abandoned, in the treatment of fractures. The great advantages of the sheet, in the adaptation of the long thigh splint, is well seen in these, as in other fractures of the femur, for without in the slightest degree disturbing the fractured portions, the sheet may be unfringed, turned aside, the parts examined, and the progress of the case ascertained.

Having had many opportunities, whilst a chemist in an hospital in England, before coming to Edinburgh, and seeing the method adopted by Mr. Lyne, in the clinical wards of the Royal Infirmary, of applying the long thigh splint, by means of successive layers of bandages, and having since, whilst acting as chemist and clerk, under Mr. Lyne, always used the sheet, instead of bandages, I can myself testify, to the greater convenience and easier
Mode of application of the sheet.
A used to be a long and troublesome process to enrope and reapply the bandages of a fractured thigh and this was always required a few days after accident had happened, owing to the decrease of the swelling, the patient's limb required to be raised and supported by two or more attendant and it was impossible to prevent a certain amount of movement taking place between the fractured bones.

But in many cases of intra-capsular fracture, especially those happening in weak and very old people, it is impossible to use the long splint, owing to their restless state and the risk of bed sores forming if they are kept lying in one position, the urine and faeces being perhaps the cause involuntary, owing to the shock of the injury, this, adding to the certainty of sloughing Sores forming, in refuge is exercised too long on any joint.
An Intra-Capsular Fracture, owing to Osteitis Confining on the Hip Joint.

PRIVATE MUSEUM
In these cases, the injured limb should therefore be supported and fixed into the most comfortable position, by means of pillows, and a prefabricated prominence of the body, by means of cotton wool or other soft materials.

Intra-capsular fracture, occasionally happen, as a consequence of Acute Caries, or Acute Conaries of the Hip joint, a description of the accident. However, would require me to enter into a account of Acute Conaries, but it is not my intention to do so, in this paper. I will content myself with giving a drawing of a preparation, which I depicted, the drawing, which gives a very fortunate representation of the disease, was executed by a young artist in England.
(2.) Fractures which take place, 
altogether external to capsular ligament.

This fracture is generally produced by a greater 
degree of violence, than the intra-capsular. 
It is most common in old people, but may 
occur at any age, most frequently in adults. 
I have seen it take place in a boy, aged 
14 years.

The signs of this accident vary, according 
to the extent and direction of the fracture, 
and as we shall afterwards see, the symptoms 
may be masked by one or two impressions of 
the upper fragment of the ankle.

It is attended by a considerable amount of 
pain and constitutional irritation in many 
cases.

The most usual signs are (1) Shortening of 
the affected limb, from one inch, to one inch 
and a half, or two inches (2) Eversion of the 
foot, in most cases, but as we have before 
seen, inversion is occasionally present.
Fracture through Acetabulum and neck of Femur within the capsule, and external to it.
In Smith's book on Dislocations and Fractures, page 112, says, when the bone is inverted, we usually find either a portion, or the whole of lower fragment placed in front of the superior fragment.

And again, in comminuted extra-capsular fractures, and displacement of the trochanters, the bone, while generally remain in whatever position it has been accidently placed, it may be turned either inward or outward, or there may be inversion, at one time, eversion at another.

(3) Except in cases of impaction, distinct crepitation is felt, on the slightest movement of the joint. (4) The trochanter minor is more or less altered in shape or position, more movable, and in some cases, it may be felt to be split up into one or more pieces.

The violence, which produces this fracture may be so great, as to involve the acetabulum and pelvic bones, and there have been a...
New rare cases, in which dislocation of the head of the femur has taken place at the same time, as the fracture of the neck.

Case 8. Mr. James Alexander, 27, admitted into Our Eyns smartphone ward in Dec. 1549.

Seventeen weeks before admission, Patient fell from a carriage, upon his right thigh, the limb coming in contact with a large stone, was bent upon it, he was seen by a medical man in the country who applied the long splint, for several weeks.

On admission, the limb was two and a half inches short, the foot in natural position.

Rotating the limb at the Hip joint, the head of the bone was felt on the Ischium, a large amount of callus was then found, above the joint, showing that a fracture had taken place, but at this date, it was firmly united, nothing being able to be done for the patient. He returned home, he was able to use the limbs a little, as Mr. Syme thought, that in time it would become
more useful to aim.

The thick periosteum, covering the base of the neck, and the trochanters, may at first, keep the broken fragments together, and so cause the signs to be left-marked, but sooner or later, this will give way, and allow a greater separation of the fragments, to take place. This happens, can never occur, when the violence, causing the fracture, is severe.

On examining a Hip joint, which has recently sustained this accident, blood will be found extravasated into the soft tissues, surrounding the joint; the capsular ligament will be more or less torn, at its insertion into the femur, and the trochanters and shaft of the bone, will be drawn forwards and in worst cases, backwards and outwards, the degree of this will depend on the completeness of the fracture, and the integrity of the Joint and External Rotator Muscles. The line of the fracture, will be found to
Comminuted Fracture of Trochanters
and neck of Femur.
Entered to Capsule.
Comminuted fracture through neck and trochanter, of femur, external to capsular ligament.

(Neuecaster Hospital)
Extra-capsular fracture, with large deposit of aseptic matter.

Near the fracture, size of fracturing larger than it really was, owing to its long shelter in sheath.
Extra-capsular Fracture involving the Femur.
Extra-capsular fracture, involving the trochanters.

(Anatomical Museum, University)
(Anterior View)

Sketch (43)

United fracture through
Trochanters of Femur.
United Extra-capsular Fracture.
Fracture through neck of Femur, united externally to capsule.
United Fracture

Through neck of femur

Externae to capsule.
United Extra-Capsular fracture of Head of Femur

(Private Museum)
United Extra Caput
Fracture of neck of Femur.

(University Anatomicus Museum)
United fracture through Trochanters.
Lower fragment drawn upwards.
Gross defect of new bone.

(Nottingham Hospital)
...and direction, the drawings appended, although roughly done, may serve to illustrate these conditions.

If cases of this accident be examined some month after the injury, provided proper means of treatments have been adopted, the following appearances are generally met with.

The Capsular ligament is thickened, and in some cases new deposits of bone developed in it, the Periosteum, surrounding the neck of the bone and the trochanters, is also thickened, and new deposits of bone are found to exist, all round the fractured portion, in some cases, these bony deposits constitute a large oseous tumour, involving the trochanters and lower half of the neck of the femur, which from its size, may interfere with the movements of the joint, and which has occasionally been mistaken for an enucleated dislocation of the Hip joint, the long tumour being fixed up, as one trochanter major, and moving freely within the joint, has been taken for the...
rounded head of the femur.

The neck of the femur has undergone more or less change in its direction, and consequently, even when these fractures are firmly united by bone, there is generally shortening of the injured limb. The extent of this shortening will depend on the nature of the fracture and the treatment adapted during the progress of the cure. This fracture therefore, admits of perfect union, provided proper means be used to accomplish this object.

The same treatment must be used, as in the intra-capsular fracture, namely, the application of the outer and inner gauge splints, and the long thigh splint and sheet. Great care should be taken, that the thigh splint extends sufficiently high up, the patient's side, and be kept in that position, by means of a broad roller, just beneath the pelvis and lower portion of the abdomen; for, unless this is done, every movement of the patient will cause more or
(73)

less movement of the fractured portions and great irritation are perhaps non-union may be the result.

When from examination of the limb two months a piece after receipt of injury union is found to have taken place, the joint should be subjected to gentle exercise and the application of warm water in order to prevent as much as possible any diminution in its mobility.

There may be at first a superabundance of new bone" drawn out as we have seen but this will probably gradually diminish as the case advances.

(3) Fractures partly internal, partly external, to the capsular ligament.

The signs of this fracture will hang very much according to the extent of the injury; it may be simply an extension of an oblique intra-capsular fracture, or it may be only...
involve both portions of the neck, but the trochanters also.

It will be impossible to say, during the life of a patient, that a fracture is both internal and external to the capsular ligament, but as the treatment of this fracture does not in any way differ from that of any other fracture, though the neck of the femur this is of no great consequence.

It may be said, that the classification is therefore useless, but as this accident is known to occur, from the description of Medical Preparations, and as in this essay, a great part of the description is pathological, I think it is as well to consider this form of fracture separately.

The signs of this fracture, will therefore approach more or less in character to the intra-

capsular and extra-capsular, a may be a mixture of both, according to its nature and direction.

On examining preparations of this fracture
Fracture through neck of femur

Barely intemal and external
to capsule extensive new bone thorn and external to capsule no union internal to capsule

(Reinstitute College Museum)
the capsule or ligament is thickened and shows marks of rupture, there is generally a considerable deposit, of bone, around the capsule. On opening the capsule, firm fibrous tissue may be found to exist between the fragments, or, in some cases, there is no attempt at union, the other fragment being even somewhat absorbed; occasionally, there is an intermediate appearance, a sort of ligamentous union between the two fragments. In all these cases, whether union takes place or not, there is generally a considerable deposit of fibrous tissue, around the trochanters. If, therefore, after treating a fracture of the neck of the femur, (for some months and after this time one finds no union of the fracture), which takes place, notwithstanding the opposites of bone which may be felt around the trochanters, one may suspect that the fracture is of this nature, and otherwise as we have before stated, this
Fracture is not detectable by external examination.

This fracture is to be treated in the same manner as the extra-capsular and in most cases firm fibrous union will take place.

(4) The Impacted Fracture of the Neck of the Femur.

The full extent of this impacted, generally occurs, when the fracture extends through the neck and its base, although I believe it may take place in fracture through any portion of the neck of the femur, but not to so great an extent.

Mr. Caldes, in the Dublin Hospital reports, Case 2, Page 334, takes notice of this kind of fracture.

Mr. Adams, in Dr. Todd's Encyclopaedia, Vol. 2, Page 809, also gives a short description of it, and relates two cases, one of which I can give, as it is a good
illustration of the symptoms of the accident. Case (9) Alicia Sherlock, Oct 24, fell and injured her hip, there was little alteration in the position of the foot, after the accident, a tendency to Eversion, the limb was shortened half an inch, no recuperation could be obtained. Patient died three months and a half after the injury, and on making a section of the affected joint, there was found, a fracture of the neck, external to capsule, the neck was sunk in nearly to a right angle with the shaft, being sunk into the cancellated tissue of the shaft and became supported on lesser trochanter, capsule, and granular of bone, surrounded the seat of fracture and formed a sort of socket for the fracture or portion to lie in.

The patient could bear an equal and even walk a little on the affected limb, before she died.

The distinguishing symptoms of this fracture are
Impacted fracture through neck of Femur united. External to capsule.
Impacted Fracture through neck of Femur, united external to capsule

(Primate Museum)
1. The existence of most of the signs of fracture of the neck of the femur, and the absence, and impossibility of attaining rest station.

2. The absence of the severe loss of power and motion in the limb, the patient being able to move the affected limb, and even in some cases to walk on it. The shortening of the limb, in the form of fracture, is generally from half an inch to one inch and a half, according to the amount of impaction.

On examining a preparation of the hip joint, some months after the injury has taken place, one finds the capsular ligament thickened, the neck of the femur shortened, and the head, sunk toward the trochanters or shaft of the bone, there is generally considerable bony deposit, arround the trochanters and base of the neck, these deposits often presenting a peculiar nodulated appearance.

On making a section of the head and neck
(Section view)

Impacted Fracture of each of Femur, showing a sort of joint, surrounded by a large capsule.
Section of an impacted fracture of neck of Femur.
Section of an impacted fracture of neck of femur.

(Anatomical Museum)
of the bone the superior fragment is found driven to a greater or less extent, into the structure of the trochanters, and upper portion of the shaft, in one case, which I have examined, the impacted portion has been forced almost entirely through the trochanters major and appear on the anterior and external aspect of the shaft of the bone, where the trochanter major joins it, and in this situation the end of the superior fragment, has been partly surrounded by a fibrous deposit or capsule. There is in most cases a distinct line or interval of varying width, between the impacted portion and the tissue into which it has been driven, this interval is generally occupied by fibrous tissue, and therefore slight movement is permitted of between the fragments. The union of the fracture, is therefore of a fibrous or fibrous character, this being accomplished by the formation of a
sort of long capsule around the fractured and impacted portion.

The movement of the Hip joint may be limited, after the union, owing partly to the shortening of the crest and partly to the new oseous growth, deposited around the trochanters.

This, however, is much to be preferred, not only to the non-union, but also to the ligamentous union, of an intra-capsular fracture.

I have thus, in the above pages, given a very imperfect description of some of the afflictions of the Hip joint.

I had intended to have entered into a more full and complete account of the diseases and injuries of the Hip joint, and have collected several more facts in relation to them.

But, having very little time at my disposal, without interfering with my other studies
I thought it better to limit this essay to the consideration of those subjects described.

FINIS

(Thomas Annandale)
1860

It is curious to see
many objects of disregard
up inIntPtrites - keeping
founded constative.

Then the last, after
not the Philemone
Bohemia. He is helpless to
mean to invite the willing
money to the remedy.

End of it taken manifest.

End of speech to perform.