On the pathology and operative treatment of "hip" disease / by Thomas Annandale.


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ON

THE PATHOLOGY

AND

OPERATIVE TREATMENT

OF

"HIP" DISEASE.

BY

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PREFACE.

THERE is now little difference of opinion among Surgeons as to the curability of the early stage of Hip Disease, and the proper principles of treating it; but there is not the same unanimity of opinion in regard to the treatment of the later stages, and particularly in regard to operative interference in the more serious conditions of this articulation.

With the hope of assisting in the satisfactory solution of the latter question, I record the results of my observations and operations in connexion with this affection. I am the more anxious to bring this experience before my professional brethren, because the employment of Mr Lister's antiseptic treatment appears to me to open up new and important points in relation to operative interference in diseases of the hip and other joints.

These papers have already appeared in the *Edinburgh Medical Journal*, but I believe that they will be more conveniently studied in the present connected form.

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PATHOLOGY AND TREATMENT OF HIP DISEASE.

CHAPTER I.

PATHOLOGY OF HIP DISEASE.

CONSTITUTIONAL causes are no longer held to be the chief agents in producing hip or other joint diseases, but the tendency of surgeons now is to attribute most of these affections to *local* causes, and more particularly to injuries of all kinds. Joint diseases do undoubtedly not unfrequently occur in strumous or unhealthy patients, and are then not so amenable to treatment and less satisfactory in their results, owing to constitutional and other complications; but even in these cases local injuries are usually the exciting agents of the disease.

"Hip" disease may be *acute* or *chronic* in its nature. In the majority of cases the disease is more or less chronic, as distinguished from the very acute form of joint disease; but cases are occasionally met with which run their course in a few days or weeks, and end in early suppuration and rapid destruction of the joint textures. I have seen such a case—not pyæmic in its nature—terminate fatally on the tenth day, and the post-mortem examination showed suppuration of the joint, complete destruction of the articular cartilage of the head of the femur and acetabulum, and extensive destruction of the head of the femur itself and osseous walls of the acetabulum.

Fig. 1 illustrates the almost complete destruction of the articular cartilage of the head of a femur, with caries of the bone, from an acute case of hip disease treated by excision three weeks after the first symptoms appeared. In this case

Fig. 1.

the symptoms followed an injury to the joint, and at the operation well-marked signs of acute synovitis were present, and there was also considerable destruction of the cartilage lining the acetabulum. The case will be again referred to in connexion with the notes on excision. Holmes[1] records a case of hip disease of one month's standing, and refers to another related in the work of MM. Martin and Collineau, in which death took place from an acute abscess of the hip within a few days of the first appearance of the symptoms. In the latter case ulceration of the ligamentum teres and signs of synovitis were the chief conditions found.

The question as to which joint structure is primarily affected in hip disease must still be considered a disputed one, and before expressing my own opinion and illustrating some of my observations, I will briefly refer to other authorities on this subject. Syme[2] says, "The disease may be then regarded as in general consisting primarily and essentially of chronic inflammation in the bones composing the joint, of which the pelvic portion usually suffers more than the femur." Holmes[3] remarks, "It is quite possible that different structures may be

[1] Diseases of Children, 2d edition.

[2] Principles of Surgery, 5th edition. [3] Loc. cit.

affected in different cases, but my own opinion is that in many the disease begins by an inflammation of the ligaments." "Mr Aston Key was of opinion that the inflammation begins usually in the ligamentum teres, and although the view was founded on an erroneous theory of the functions of that ligament, still the main argument on which it is based seems to me sound, as showing that some part of the ligamentous apparatus is generally very early affected." Holmes remarks further, "Whether the bones are usually affected or not in the commencement of the disease it is not easy to judge. It is probable enough that there may be cases in which the inflammation spreads outwards from the bones towards the capsule, while in others, and those the most common cases, its course is the reverse, viz., from the capsule towards the bone; but the point is one very difficult to determine anatomically." Bryant[1] distinguishes between synovial and osseous symptoms in cases of hip disease, and considers that the disease of this and other joints most frequently originates in ostitis in young patients. Barwell[2] writes, "First as to the structure in which disease of the hip joint may commence. There can be no doubt that it may begin in the synovial membrane and in the bone like other joint diseases; there is no reason to suppose, nor is there the slightest proof, that it may commence in structures in which diseases of other joints do not begin—for instance, in the ligaments;" he writes further, "We have seen that when the subsynovial tissues in which ligaments are placed inflame, the ligaments themselves suffer, soften and become thickened, or absorbed, as the case may tend."

Bauer,[3] in his researches on the ligamentum teres, says, "Collectively I look upon the ligamentum teres, therefore, as the essential nutritive appendix of the head (of femur), and its destruction during the epiphyseal period as tantamount to

[1] The Practice of Surgery. [2] On Diseases of the Joints.
[3] Lectures on Causes, Pathology, and Treatment of Joint Diseases.

the destruction of the head itself." He also refers to the pathological facts:—(1) That this ligament is very early destroyed in hip disease; (2) That the head of the femur is invariably reduced excentrically in size, and, in a few exceptional cases, thrown off *in toto.*

Sayre[1] writes, "The pathological changes that these causes produce are either synovitis, from a rapid and excessive change in temperature, or violent wrenches or strains tearing from its attachments the ligamentum teres, thereby inducing necrosis of the head of the femur from rupture of the blood-vessel which supplies it; or concussions, falls, jumps, blows, will produce an extravasation of blood in the articular lamella, which sets up an inflammation; the cartilages soon die on account of their low vitality, become eroded and necrotic; interstitial absorption of the bones takes place, due to the constant pressure from muscular contraction, and finally exfoliation. But no matter what the cause, or which of the tissues originally involved, they all, sooner or later, become commingled and included in the general destruction."

Having myself, with the aid of antiseptic treatment, incised and examined many diseased hip-joints at an earlier stage of the disease than that in which incisions are usually practised, I have come to the conclusion that, although the disease may originate at times in the synovial membrane or pelvic bones, it most frequently commences in the head of the femur. When examining cases of the disease in the early stage of destruction of the joint textures, I have found in the majority little implication of the acetabulum or its cartilage, but well-marked destruction of the cartilage covering the head of the femur, and other signs of pathological changes in this bone. I can confirm the observations of Holmes, Bauer, and others as to the early destruction of the ligamentum teres, for I have invariably found this ligament wholly or partially destroyed,

[1] On Diseases of the Hip-Joint.

but I think that this condition is secondary to osseous or synovial inflammation, and that it does not originate in inflammation of the true ligamentous tissue.

The very acute cases to which I have referred, have, I think, their origin in acute synovitis, which is quickly followed by suppuration and disorganization of the joint structures, and I also believe that sometimes synovitis of a more chronic nature may be the primary origin of hip disease.

The pathological conditions which I have observed in the head of the femur, are—(1st.) More or less destruction of the articular cartilage, with signs of articular ostitis and separation of the cartilage from the bone, to a greater or less extent.

Fig 2.

Fig. 3.

This condition is illustrated in Fig. 2. In some cases the entire cartilage is loosened and separated from the bone, as is well shown in Fig. 3. The cartilage in the preparation from which it was taken could be lifted off from the bone like a cap, and the bone underneath was softened and inflamed.

(2d.) Distinct carious cavities in the head or neck of the bone, with or without necrosed portions of osseous tissue in their interior, in addition to more or less destruction of the cartilage and superficial articular caries. Figs. 4 and 5 are taken from examples of this condition.

(3d.) Inflammation and suppuration in connexion with the epiphyseal line between the head and neck, attended with

softening and destruction of the surrounding bone, and more or less separation of the head from the neck.

Fig. 4.

Fig. 5.

Figs. 6 and 7 are taken from the section of a preparation which was a well-marked example of this change.

Fig. 6.

Fig. 7.

(4th.) In the advanced stages of the disease, or in cases more acute in their progress, the head of the bone, and in some cases the neck, is more or less destroyed by caries, as is

Fig. 8.

Fig. 9.

illustrated in Figs. 8 and 9. In one case under my care the neck of the bone was almost completely destroyed, so that on slightly moving the bone it broke, leaving the remains of the head in the acetabulum.

(5th.) I have met with two cases of disease of the hip, in which the whole femur, ilium, and probably others of the bones, were diseased through their whole structure. The outer table of these bones was thin, and easily cut with a knife, and the cancellated texture was composed of fatty matter, with a few osseous plates and threads. Both these cases were in young adults, and the head, neck, and a portion of the shaft of the femur of one of them, is illustrated in section in Fig. 10.

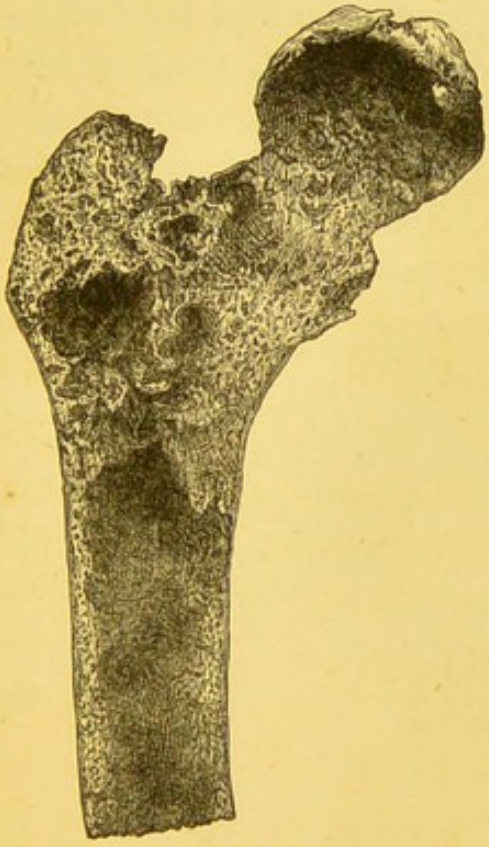

Fig. 10.

In all the cases illustrated under the first three heads, there was little implication of the acetabulum, except at the point of attachment of the ligamentum teres; and any diseased condition of this cavity which did exist, gave rise to no trouble after the removal of the affected head of the femur.

In all these, the synovial membrane was thickened, but, as I have already explained, I consider the synovial involvement

to have been secondary in these cases. In all, there was suppuration of the joint, limited in some cases, but in all well established. In none had the abscess or suppuration opened externally.

Had the disease in these cases originated in the synovial membrane, I should have expected to find the cartilage and walls of the acetabulum more implicated.

When an old-standing diseased hip-joint is examined, it is not easy to determine in which texture the disease commenced, for all are more or less involved; but my observations prove, I think, that it is most common for hip disease to originate in the head of the femur. I could have figured many more preparations showing similar pathological changes in the head of the femur, but it seemed to me unnecessary, as all the preparations in my collection not here illustrated can be classed under one or other of the conditions already described.

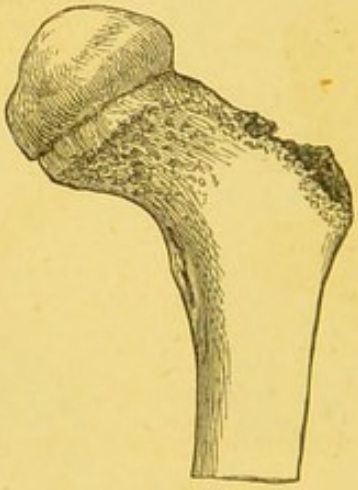

Fig. 11.

Caries or necrosis originating in the great trochanter or bone near it may lead to disease of the hip-joint or may simulate it. I have in Fig. 11 illustrated a condition of the kind in which the great trochanter is affected with caries which has almost completely destroyed this portion of bone. The hip-joint was not affected in this case. Velpeau, Fer-

guson, Teale, Erichsen, and other surgeons have excised this process for caries, and Mr Gant[1] writes thus: "Excision of the trochanter major may occasionally prove sufficient, caries of this portion of the femur existing without disease of the hip-joint. I have had one such case, and with a successful result."

The condition of the acetabulum in hip disease is influenced by the site of origin of the disease, the acuteness of its progress, and the length of its standing. In disease originating in the head of the femur, I believe that this cavity is at first little affected; but if the disease is uninterfered with, rapid in its progress, or of long standing, the articular cartilage and osseous walls of the acetabulum become more or less destroyed. A common result is that in which the cavity becomes enlarged and deepened, as is illustrated in Fig. 12. In

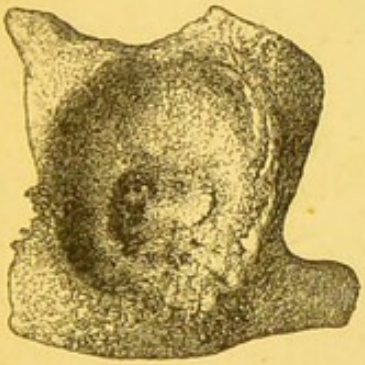

Fig. 12.

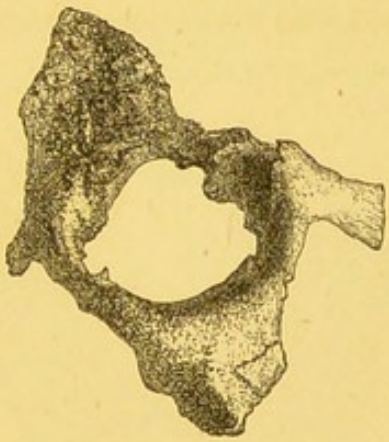

Fig. 13.

other cases the destruction is more complete, and the floor of the cavity in whole or part disappears, forming an opening communicating with the pelvis, and in some cases allowing the head of the femur to pass into this space. Such a condition is shown in Fig. 13, and is taken from a preparation which I removed after death; the head of the femur, or rather what remained of it, lay in the pelvis in this case.

[1] Lettsomian Lectures on Excisional Surgery of the Joints for Disease. —*Lancet*, 15th July 1871.

Again, limited portions of the brim or walls of the cavity may be destroyed by caries, or become necrosed, or the disease may involve a considerable portion of the ilium.

The similarity between the pathology of the shoulder and hip joints is very marked, and I could from my collection illustrate conditions in the head of the humerus exactly resembling those which have just been figured in connexion with the head of the femur. The glenoid cavity of the shoulder-joint, like the acetabulum, is frequently found comparatively little involved in the earlier stages of disease of the articulation.

In connexion with the subject under consideration, it is interesting to study the conditions which result in cases of hip disease that undergo a natural cure.

In the early stage of the disease a cure may take place with little or no alteration of the joint structures or functions; but when suppuration has taken place, and more especially if it

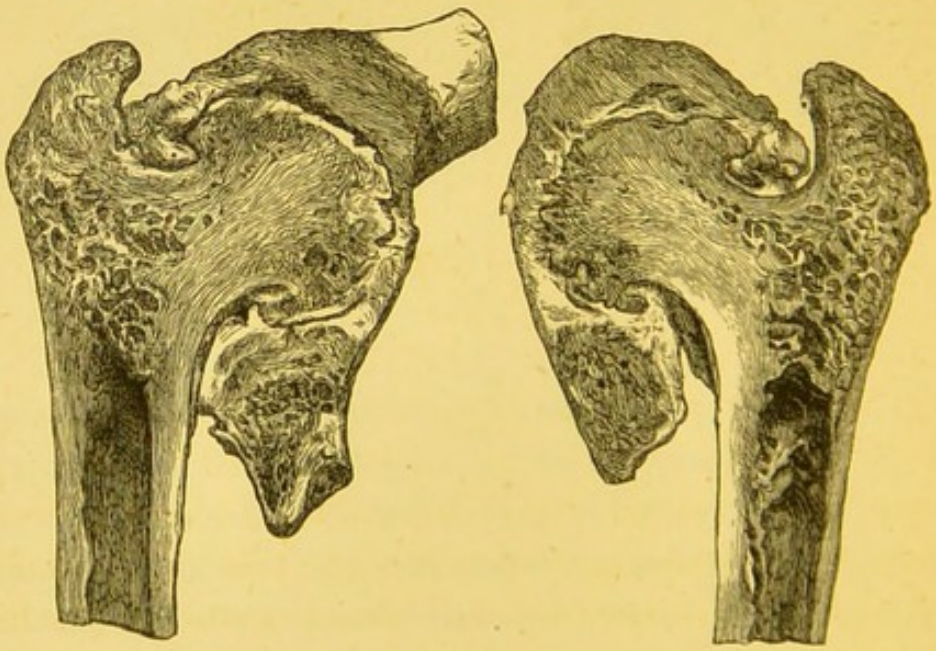

Fig. 14. Fig. 15.

has been left unrelieved for some time, the joint does not recover without some changes.

The simplest of these changes is fibrous anchylosis, which

is usually preceded by the destruction to a greater or less extent of the cartilage and superficial articular surface or surfaces, and by some enlargement or deepening of the acetabulum. New osseous deposits may also take place in and around the diseased joint.

This form of anchylosis is well shown in Figs. 14 and 15, which are taken from a section of a hip-joint removed by me after death. In this case the disease had become cured, but the limb was shortened fully an inch, and its movements at the hip were very slight. This preparation is now in the Anatomical Museum of the Edinburgh University.

Fig. 16 is taken from the section of an anchylosed hip removed after death from a patient who had hip disease for

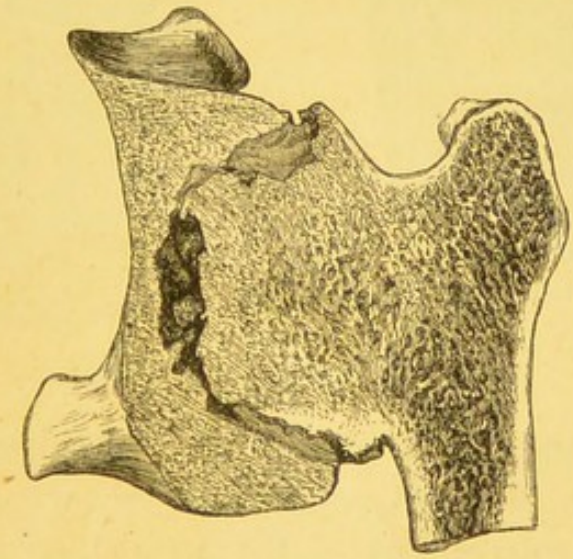

Fig. 16.

nearly twenty years. There were several sinuses opening externally, and passing down to diseased bone in the acetabulum, and the limb was fixed in a flexed position. The head of the femur was in part destroyed, and connected to the acetabulum by fibrous tissue, and there were several small pieces of diseased bone lying loose in the cavity.

Occasionally complete osseous anchylosis takes place, the

remains of the head or neck of the femur and the pelvic bone forming a continuous bony structure. Of this condition I have in my collection two preparations, one of which is illustrated in Figs. 17 and 18, which are taken from a front view and section of the preparation.

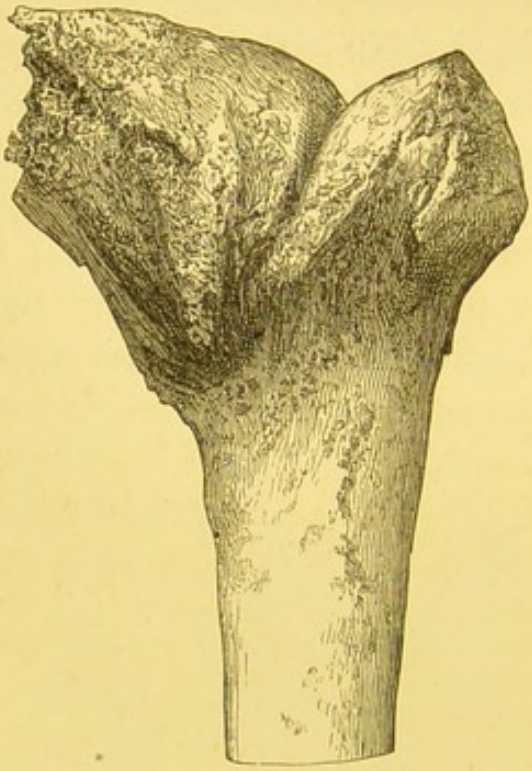

Fig. 17.

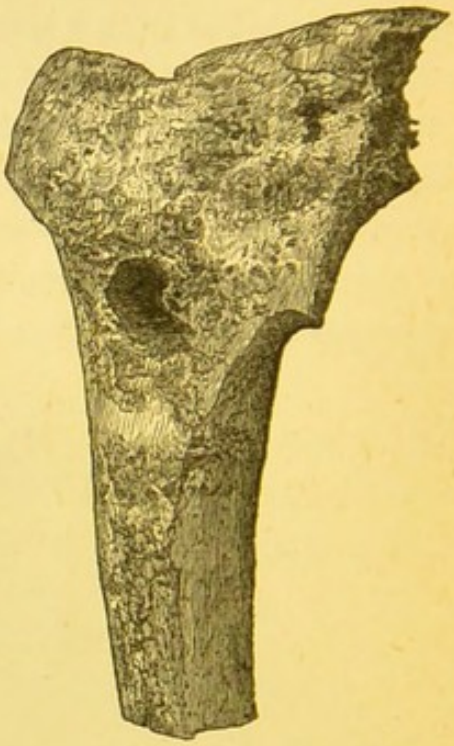

Fig. 18.

In other instances, the remains of the head or neck of the femur become displaced, usually upwards, owing to the destruction or enlargement of the acetabulum; or, in rarer cases, a complete dislocation takes place. In these cases the cavity of the acetabulum becomes filled up more or less, or obliterated altogether, and what remains of the head or neck of the femur articulates with a new cavity or surface on the edge of the acetabulum, or on the dorsum of the ilium, thus forming a kind of new joint.

In Fig. 19 a condition of this kind is illustrated from a case in which the head and greater portion of the neck of the femur had been destroyed; the remains of the neck

forming a rounded surface, which articulated with a new and shallow cavity on the upper edge of the acetabulum.

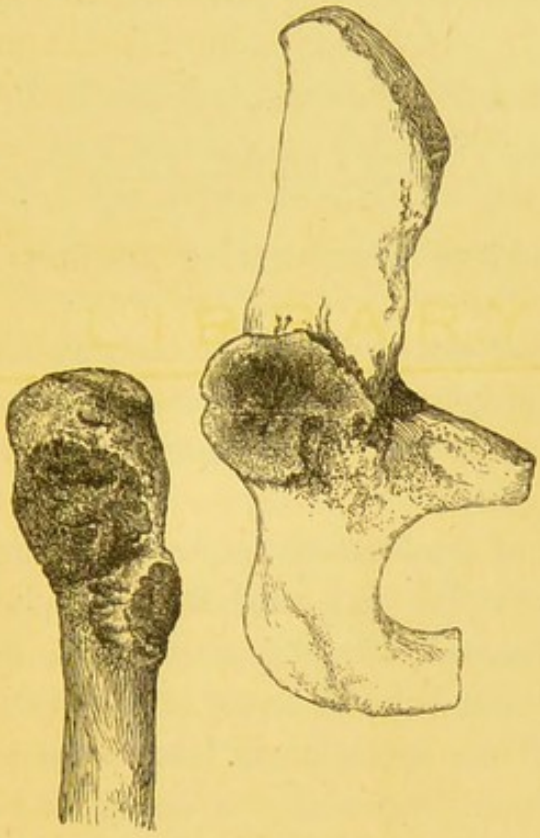

Fig. 19.

The original acetabulum no longer existed, but had become obliterated.

In these conditions of natural cure, there may or may not be deformity of the limb. There is always shortening, and unless the case has been carefully treated, the thigh is frequently fixed in a flexed position, forming a more or less acute angle with the pelvis, and so rendering the member comparatively useless.

CHAPTER II.

OPERATIVE TREATMENT OF HIP DISEASE.

Before recording my own cases of excision for the relief of hip disease, I propose to consider some of the opinions and experiences of other surgeons in connexion with this operation.

The removal of the head of the femur for the relief of hip-joint disease, was first performed in this country by Mr A. White of London, and afterwards by Sir B. Brodie, and Mr Hewson of Dublin, but the credit of successfully practising and advocating this operation in later times is undoubtedly due to Sir William Fergusson, who, in the Medico-Chirurgical Transactions for 1845, published an interesting account of his first case. Since then, the operation has been more or less favourably considered by different surgeons, but it cannot be said that there is a unanimous feeling in its favour.

Within the last few years, many cases and several statistics of the operation have been published. The largest number of cases has been collected by Hodge and Good, and the statistics of both give a mortality of about one half of the whole cases operated upon. Hodge's tables, however, show that the mortality is much greater in adults than in children.

Holmes[1] records 19 cases in children, of which 6 died from direct effects of the operation; 1 died after operation from previous effects of the disease; 1 died of independent disease some time after recovery from amputation; 2 recovered from

[1] System of Surgery (2d edition).

the operation, but not from the disease, and died a long while after; 2 were little, if at all, benefited; 1, twice excised, was doubtful; 3 had useful limbs, but with sinuses; 3 recovered completely.

Bauer[1] records 17 cases of partial resection of the hip-joint, of which 9 recovered, and 2 were still under treatment.

The excision of the entire acetabulum as well as the head of the femur was first practised and strongly advocated by Mr Hancock, and has since been successfully performed by Erichsen and others. Mr Hancock[2] in his well-known paper refers to the importance of giving exit to pelvic abscesses connected with hip disease, by making a free opening and excising the head of the femur and acetabulum if necessary. He objects to the principle that excision should only be performed (1st) in the last stage of the disease; (2d) when the head of the bone is dislocated; (3d) when the acetabulum is free from disease; (4th) when the amount of pelvic disease is but trivial. He says further, "In deciding upon this operation, we should be guided solely by the condition of the patient, and not by any arbitrary stages of disease."

Let me now quote some of the more modern authorities on the question of excision in hip-joint disease.

Barwell[3] writes, "In the present high—perhaps somewhat too high—value which is accorded to the operation of excision, it is to be feared that patients may be unnecessarily subjected to that treatment, rather than that the operation will be too much dreaded. We should recommend that when a case, even if external abscess be already formed, the efficiency of extension be fully tried; if in a night or two the starting pains greatly diminish and subsequently cease, the proposal of excision should be postponed until general symptoms, the formation or increase of pelvic abscess, may warrant return to such consideration." He also says, "But it may be here re-

[1] Loc. cit. [2] Lancet, 25th April 1857. [3] Loc. cit., page 442.

marked, that this operation is in my belief usually postponed too long, and that it should not be so much regarded as an ultimate resource to be employed only because amputation is worse than useless; it should rather be viewed as a means whereby we may yet procure for our patient a valuable limb."

Dr Fock—quoted by the same author—writes, "The proper moment for the operation has, according to our view, arrived as soon as caries of the joint has been diagnosed with certainty."

Bauer[1] says, "Though I am not a great admirer of resection of the hip-joint, nevertheless I honestly believe that its performance, when warranted by the anatomical changes of the joint, bids as fair a chance of success as the resection of any other joint."

Dr Good[2] says, "MM. Verneuil and Le Fort, the two surgeons who more than all others of Paris fancied resection, quite share our opinion as to the fatality of these hip-joint operations, and both hold that our greatest fault lies in delay, and that heretofore the cases have been operated on only 'in extremis.'"

Sayre[3] writes, "If, however, notwithstanding your treatment, the disease progresses, suppuration increases, the joint becoming more and more impaired, showing a case of progressive caries, we then have no remedy except resection." He also—after referring to nature's method of curing these cases—writes, "And in the most favourable cases healed by kind nature in this way, they have been left with permanent deformity, and with a very much less useful limb than those which have been cured by resection. I have now performed this operation over fifty times, and can therefore speak with positive assurance upon the subject."

Bryant[4] writes, "So long as suppuration or other dis-

[1] Loc. cit., page 67. [2] Medical Times and Gazette, 3d April 1869.
[3] Loc. cit., page 19. [4] Loc. cit., page 844.

organizing change in the joint has not appeared, a good hope exists of a recovery with a useful joint; and as long as the disease is in the synovial membrane, the probability of a recovery with a valuable articulation is great. When disease originates in the epiphysis—that is, the head of the bone—or in the epiphyseal connective cartilage, the prospects of a recovery with movement are slight, unless the mischief is checked in its early stage." At page 855, the same author remarks, "When should excision of the hip be performed? And, first, when should it *not* be performed? It should certainly never be performed in cases in which suppuration or disorganization of the joint has not taken place, for as long as this condition is kept off by surgical as well as medical skill, a sound hope exists that a cure of the disease, although by anchylosis, may be secured. The cases I have already quoted on previous occasions illustrate this fact. It should not be performed when all evidence tends to show that the bones entering into the formation of the joint are not extensively involved, or necrotic wholly or in part, and when the general condition of the patient under proper treatment is fairly maintained. It should not be entertained for disorganization of the hip-joint as a result of synovial disease, unless it is clear that the general health of the patient is gradually yielding to the disease. It should never be performed for acute suppurative disease. On the other hand, it should always be entertained when it is clear that extensive bone mischief exists or partial necrosis, for it is tolerably certain that under such circumstances a cure by natural processes is highly improbable. It should only be entertained when the general health of the patient is clearly giving way under the influence of local disease, whether that disease be in the bones or synovial membranes, or both."

Holmes[1] writes, "I think, however, that the operation should

[1] Diseases of Children (2d edition), page 463.

always be recommended when along with caries there is progressive deterioration of the general condition, and at the same time an immunity from visceral mischief." At page 468 the same author writes, "Should the operation be performed in cases where there is no open abscess? This is rather a difficult question. I believe the prospect of recovery is greater when the abscess is opened and the head of the femur is removed in the same operation; and if the symptoms are acute, and examination of the joint under chloroform shows that the disease of the bones is already extensive, this will perhaps be the best course to pursue." At page 458, he also writes, "The cases which I have operated upon successfully have uniformly shown that after excision the limb is not more, I think not so much, shortened as it commonly is after spontaneous cure, while it enjoys a freedom of motion never attained after recovery by the natural process, and is at the same time quite as firm and quite as capable of sustaining the weight of the body."

Most of the authors quoted refer to the fact that limited and superficial disease of the acetabulum does not interfere with the good result of excision of the head of the femur, this cavity recovering readily when the diseased portion of the femur is removed, and my experience of excision of the head of the femur confirms this fact, as will be seen by a study of the notes of the cases presently to be recorded.

I could quote other authorities on excision in hip-joint disease, but I have chosen those whom I consider good representatives of the liberal views of modern surgery in connexion with this subject.

The opinions of the authors quoted may be generally summarized as follows:—

(1.) That when suppuration and disorganization of the textures of the hip-joint continue unrelieved by ordinary treatment, excision of the head of the femur is a proper and

justifiable proceeding, if the patient's health is in a fair condition.

(2.) That the operation is more successful in children than in adults.

(3.) That in successful cases of the operation, the results, as regards the usefulness of the limb and joint, are superior to those which follow a natural cure.

(4.) That superficial or limited acetabular disease does not interfere with the performance and good result of excision of the head of the femur.

(5.) That even when the acetabulum is much involved, or pelvic suppuration exists, it is important to afford a free escape to the pus by the removal of the head, neck, and great trochanter of the femur.

(6.) That when the acetabulum is extensively diseased, it, together with the head and neck of the femur, should be removed, if the patient's condition admits of the operation.

(7.) That it has not yet been accurately decided what is the earliest stage of the disease in which the operation is justifiable, although most agree that hitherto the operation has on the whole been delayed too long.

Amputation at the hip-joint has occasionally been performed on account of hip disease, or after unsuccessful excision, and cases have been reported by Holmes, Lee, and others. This operation can, however, be justifiable only in cases where excision has failed, and the removal of the limb would seem to give a chance of saving life, or in cases where the femur is extensively diseased, or the soft textures of the thigh much destroyed by ulceration, sloughing, or the results of suppuration.

I will now record brief notes of the cases, twenty-two in number, in which I have excised the head of the femur for the cure of hip disease.

CASE 1.—J. F., æt. 17, had suffered from aggravated symp-

toms of hip disease for six months, after a slight injury to the joint. Rest and other treatment having failed to relieve the incessant pain and constitutional irritation, and symptoms of suppuration of the joint having appeared, an incision was made into the articulation on the 28th of September 1869. The introduction of the finger having determined that the cartilage of the head of the femur was entirely destroyed and the bone carious, this portion of bone, together with the neck and trochanter major, was sawn off. The acetabulum was only slightly affected. His progress after the operation was slow, but satisfactory, an attack of erysipelas having delayed his recovery, and he was able to move about on crutches at the end of six months. In May 1870, the wound reopened, and discharged some fetid pus, and after this the patient again improved, and was able to go out; but, in a few weeks, symptoms of liver disease appeared, with dysenteric diarrhœa, and from the effects of this he gradually sank, and died on the 29th of August 1870, about eleven months after the operation. The wound was small, and still discharging slightly at the time of his death. The limb was nearly three inches short, but promised to be quite useful had the patient lived. At the post-mortem, the liver was found to be greatly enlarged, and both it and the intestines were much affected with waxy degeneration. The condition of the joint is represented in Figs. 20 and 21, which are taken from a front view and section of the articulation. The femur, where sawn through below the trochanter, had become rounded off. The cavity of the acetabulum had almost disappeared, and the rounded femur was attached to the dorsum of the ilium by ligamentous and fibrous tissue, and by the surrounding muscles, which in the sectional view have all been dissected off. There was free movement in the new joint. The wound communicated with two sinuses, which passed down to some small portions of necrosed bone in the situation of the original

acetabulum. With the exception of these small pieces of diseased bone, there was no trace of osseous disease.

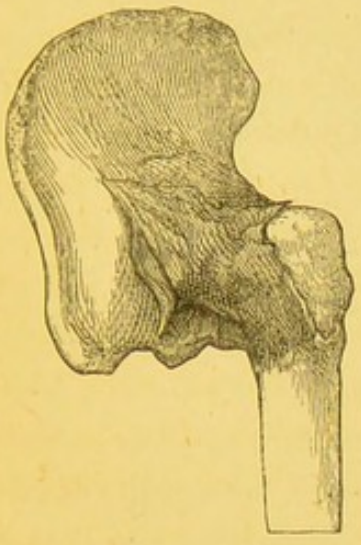

Fig. 20.

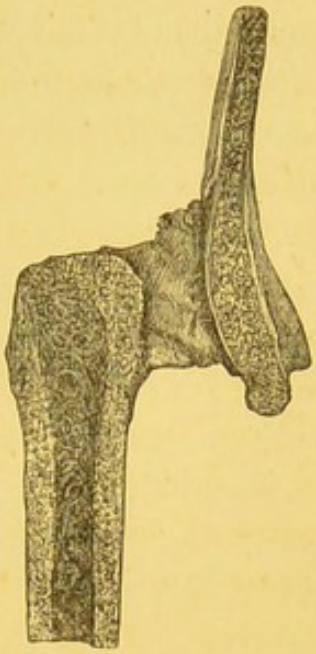

Fig. 21.

Case 2.—F. G., æt. 19, had suffered from disease of the hip for nearly three years. There were numerous sinuses passing down to the head of the femur, which could be felt softened and diseased. On the 25th of March 1870, I enlarged one of the sinuses, and proceeded to remove the diseased bone; but this was found to be a matter of difficulty, the bone being so soft that it had to be taken away in pieces. In this way, the head, neck, and great trochanter were removed. This case was one of those referred to in page 13, in which the outer table of the bone was thin, and the cancellated texture principally composed of fatty matter. The wound did not completely heal after this operation, so it was again enlarged on the 17th of May, and two inches of the shaft of the femur removed. The shaft of the bone where divided was, however, diseased in the same way. He improved after this, and was able to go about on crutches on the 5th of July. On the 24th September, he was dismissed with a sinus still discharging, but

able to go about a little. I afterwards heard that this patient died at his home some six months after his dismissal.

Case 3.—Master I., æt. 6, had suffered from signs of hip disease for twelve months, and had been treated by the application of the long splint and extension. When seen at the end of March 1870, there was a large abscess (unopened) in the corresponding groin, and all the signs of suppuration of the joint. On the 20th of April, an exploratory incision was made immediately above the great trochanter, and the introduction of the finger having determined that the cartilage of the head of the femur was destroyed, and this bone in a carious condition, the head, neck, and great trochanter were sawn off. The acetabulum was not interfered with, being only slightly involved. The progress of the patient was slow, owing to the formation of several sinuses in the groin; but a gradual and complete recovery took place, and up to this date he remains perfectly well. He is now able to walk on the limb, and to move the joint freely. Figs. 22 and 23 are taken from photographs, which illustrate the present condition of the limb and its amount of mobility. The limb is fully three inches shorter than the other.

Case 4.—D. P., æt. 16, admitted into the Infirmary in October 1871, with symptoms of hip disease, which had followed an injury of the joint six weeks before. Six weeks of rest and other treatment failed to relieve the symptoms, and as signs of suppuration appeared, an incision was made into the joint, and the head of the femur being found to be diseased, was removed, together with the neck and a portion of the great trochanter. The patient was much relieved by the operation, but his progress was slow. He gradually, however, regained strength; and although much emaciated, he was, at the end of nine months after the operation, able to go to the Convalescent Hospital in the country. At this time, there was one small sinus open; but the joint and

limb were useful and movable. When at the Convalescent Hospital, he was suddenly seized with symptoms of tuber-

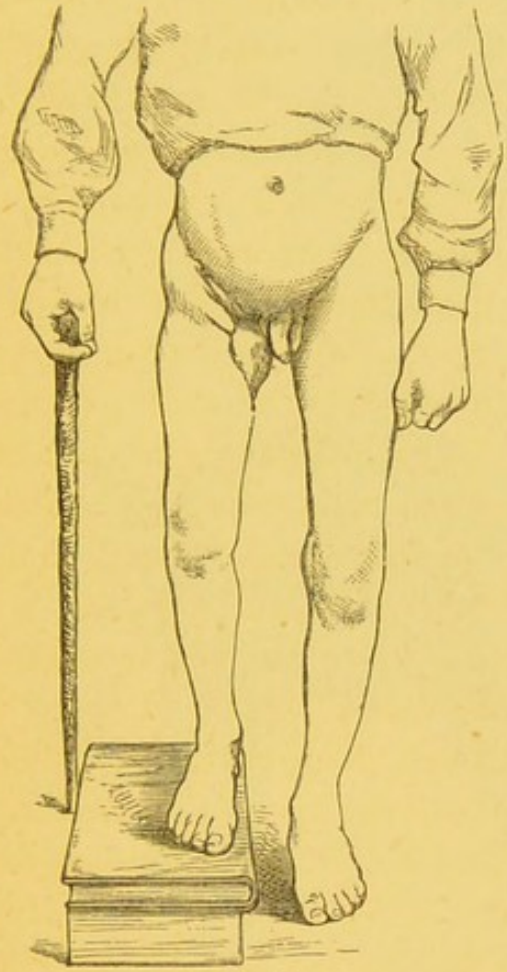

Fig. 22.

Fig. 23.

cular meningitis, and died in three days. The date of his death was September 1872, about ten months after the operation. An examination of the joint after death showed an excellent result as regards the formation of a new articulation. The upper end of the femur was rounded off and quite healthy, and rested against the upper wall and edge of the acetabulum. The acetabulum was enlarged and partially filled up by fibrous tissue and the remains of the capsular ligament, which united the rounded femur to this cavity. The acetabulum was quite healthy, except that two small portions of necrosed bone lay in little cavities, one in its

floor, and the other in its inner lip. Fig. 24 is taken from a photograph of this new joint.

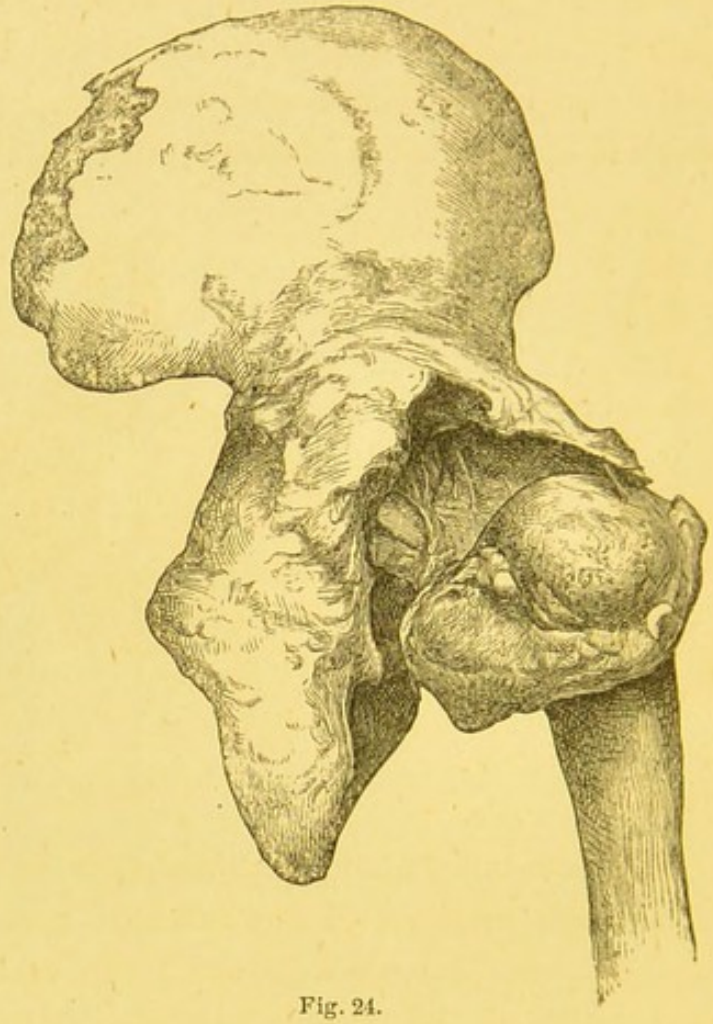

Fig. 24.

Case 5.—G. B., æt. 11, was admitted into the Infirmary in November 1871, on account of hip disease of two years' standing, which had followed an injury of the joint. On admission, all the signs of advanced disease with a large abscess in the groin were present. On the 1st December 1871, the head of the femur was excised by sawing through the centre of the neck. The patient's progress was most satisfactory. Two months after the operation, the wound was almost healed, and the joint could be moved without pain, but not very freely, in all directions. One month after this, his progress still appeared to be most favourable; but very shortly, symptoms of

dropsy ensued, and it became evident that his liver and other internal organs were affected. He gradually became weaker, and died on the 11th March 1872. The post-mortem examination disclosed tubercular disease of the liver, kidneys, spleen, intestines, and one lung. The wound was quite superficial, and the condition of the joint is illustrated in Figs. 25 and 26,

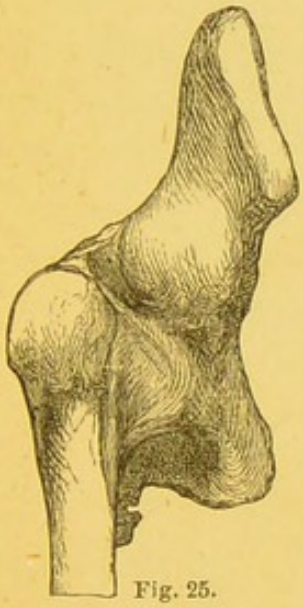

Fig. 25.

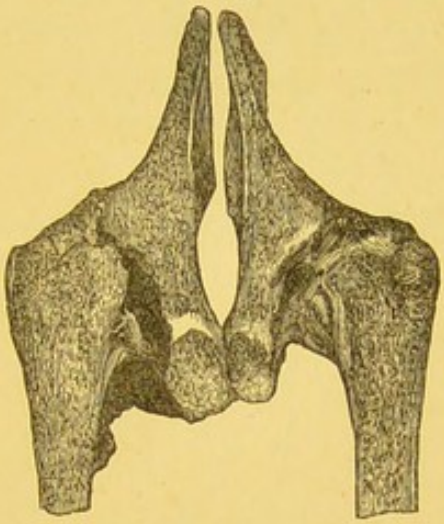

Fig. 26.

which are taken from a front and sectional view of the articulation. There was no trace of any diseased bone in connexion with the joint. The neck of the femur where sawn through was rounded off and articulated with the upper wall of the acetabulum. The acetabulum was enlarged, and its cavity shallowed, and the two bones were connected by the remains of the capsular ligament, which was wonderfully perfect, and by some fibrous bands and portions of muscular tissue.

Case 6.—G. J., æt. 6. The disease had existed one year, and had been carefully treated without effect by rest and extension for several months. As there was fluctuation to be felt over the joint, an exploratory incision was made on the 31st of January 1872, with the result of finding the head of the femur diseased, and the acetabulum little involved. The

head of the femur was therefore excised, and a perfect recovery took place, the patient leaving the hospital on the 20th June with a useful limb and perfectly movable joint. The limb was about two inches short, and the patient could stand upon it without any support. Figs. 27 and 28 are from photographs

Fig. 27.

Fig. 28.

taken two years after the operation, and well illustrate the good result obtained in this case.

Case 7.—D. M'I., æt. 6, had suffered from symptoms of the disease for about two years, and had been unsuccessfully treated by rest and extension. Suppuration took place, and sinuses formed on the outer and anterior aspects of the thigh. On the 15th of March 1872, I excised the head of the femur, the cartilage of which was destroyed, and the bone diseased. The cartilage of the acetabulum was destroyed at the point of attachment of the ligamentum teres and for some distance

round it, but this cavity was not interfered with. The patient's progress was slow, but he improved much, and he left the hospital on the 17th of October 1872 with the sinuses unhealed. After leaving the hospital, signs of dropsy appeared, and he died about nine months after, the wounds never having closed.

Case 8.—M. D., æt. 19, had suffered from symptoms of hip disease for six months, which had not been relieved by rest and extension. He had great pain, with startings of the limb, and deep fluctuation could be detected over the joint. The head of the femur was excised on the 19th April 1872. Its cartilage was in great part destroyed, and the bone was carious.

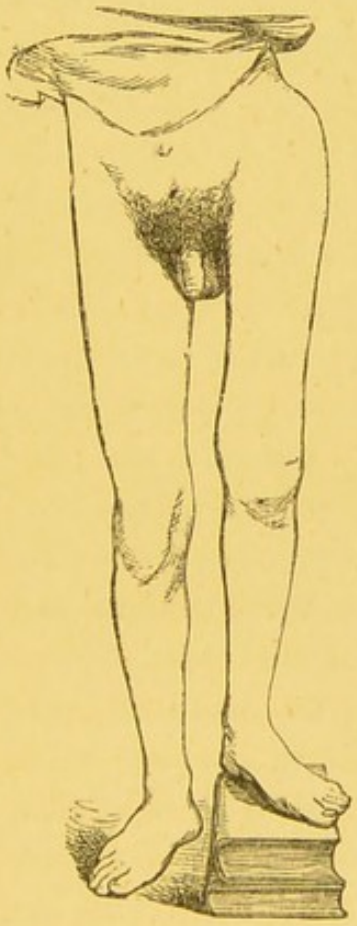

Fig. 29.

Only the head of the bone was removed, the acetabulum being scarcely affected. The result of the case was satisfactory, al-

though the progress towards recovery was slow. At the end of a year, he was able to go about on crutches, and, six months after, he could walk with the aid of a stick. The limb was three inches short, and in good position, but the movements of the joint were limited to slight flexion and extension. Fig. 29 is taken from a photograph of this case three years after the operation.

Case 9.—E. H., æt. 7, had suffered from symptoms of the disease for about five months, and had been treated with the extension apparatus for three months. This treatment relieved much of the pain, but signs of suppuration of the joint appearing, an exploratory incision was made, and the head of the femur, being found to be denuded of cartilage and diseased, was sawn off. The acetabulum was healthy, except at one point, and this was scraped with the gouge. The progress of the patient was excellent, and she left the hospital on the 17th of January 1873 with a most useful limb.

Case 10.—E. R., æt. 6, had suffered from symptoms of the disease for two years. The symptoms followed a fall down stairs, and were for a time relieved by rest and extension ; but suppuration having taken place, an exploratory incision was made on the 10th of July 1872, and the condition of the joint examined. The greater part of the head of the femur had disappeared, and the neck of the bone was also affected with caries. A section was made through the great trochanter, and the diseased bone thus removed. The acetabulum was scarcely affected. She made an excellent recovery, and left the hospital on the 15th of January 1873. Six months after leaving the hospital, photographs of this patient were taken. and from these photographs Figs. 30 and 31 are copied. The limb was about one and a half inches short, and was perfectly strong and movable in every way. She could run about freely without any support, and only required a high-heeled boot to equalize the length of the two limbs.

Case 11.—J. S., æt. 6, had suffered from the disease for ten months, the symptoms following an injury of the joint. For

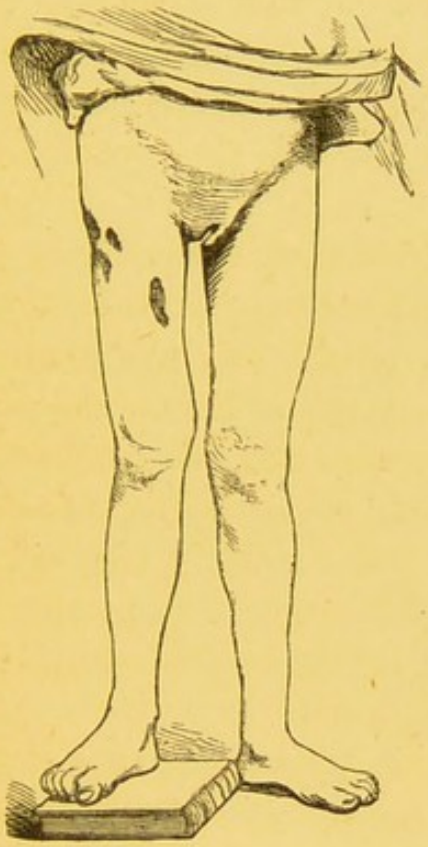

Fig. 30.

Fig. 31.

eight months he was treated with extension and the long splint, and about two months previous to admission a large abscess formed over the outer aspect of the thigh and burst, discharging many ounces of pus. The signs of suppuration of the joint being well marked, an incision was made on the 12th of July 1872, and the diseased bone removed. The head and a portion of the neck of the femur were affected, so that the section was made through the great trochanter. A portion of the floor of the acetabulum was affected and was gouged away. This patient made a slow but good progress, and he was dismissed cured with a useful limb on the 15th May 1873. Fig. 32 is taken from a photograph of this patient.

Case 12.—M. C., æt. 28, had suffered from symptoms of the disease for six years, and had been treated in various ways.

Suppuration of the joint took place, with great pain and much constitutional irritation, so on the 30th of September 1872, I

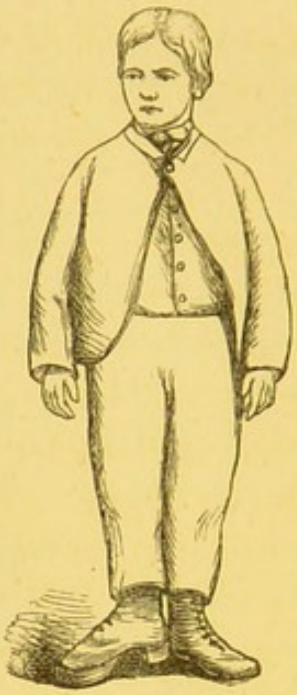

Fig. 32.

removed what remained of the head and neck of the femur by sawing through the bone immediately below the trochanter. The head of the femur was partially anchylosed to the acetabulum, which rendered the operation more difficult than usual. The acetabulum was enlarged and carious at several points. The patient improved after the operation, and for nine months his progress was good, but after this symptoms of liver disease showed themselves, and he left the hospital with the sinuses still discharging on the 27th of September 1873. The joint was freely movable without pain.[1]

Case 13.—Mr R., æt. 17, had suffered from symptoms of the disease for about six months, and had been carefully treated by rest and extension. Signs of suppuration having shown themselves, an incision was made into the joint, and its condition examined on the 12th of November 1872. There

[1] This patient died some months after leaving the hospital.

was pus in the cavity of the articulation, and the entire articular cartilage was separated from the head of the femur, and this portion of bone was also diseased. The acetabulum was only affected at the point of attachment of the ligamentum teres. The head of the femur was therefore removed by sawing through the neck close to the great trochanter. The patient made a good recovery, and five months after the operation he was going out on crutches with a useful and movable limb, and with the wound quite healed.

Case 14.—J. F., æt. 14, had suffered from symptoms of the disease for about seven months, and had been treated with rest and extension for three months, but abscesses formed in the groin and thigh, and caused great constitutional irritation. On the 9th of January 1873 the abscesses were opened, and the head and neck of the femur were removed by sawing through the bone close to the great trochanter. The acetabulum was healthy, except at one point on its floor, and this was scraped with the gouge. His progress was slow but good, and he was dismissed to the Convalescent Hospital in June. In August of the same year, about eight months after the operation, he was examined and found to have a perfectly useful limb. The limb was about three inches short, but freely movable at the hip and other joints, and the wound was soundly healed.

Case 15.—D. M'F., æt. 20, had suffered from symptoms of the disease for about one year, and had been treated by the usual means without success. Signs of suppuration were present, and deep fluctuation could be felt over the joint. On the 18th of March 1873, an incision was made, and the head of the femur removed, together with a small portion of the lip of the acetabulum, which was also diseased. The entire cartilage covering the head of the femur was destroyed, and the bone exposed and carious. His recovery was good, and he returned home on the 29th of June with a movable and useful limb, and with the wound healed. Two years after the

operation, photographs of this patient were taken, and these are illustrated in Figs. 33 and 34. The limb was two and a half inches short, and perfectly strong and movable, and he could walk several miles without fatigue.

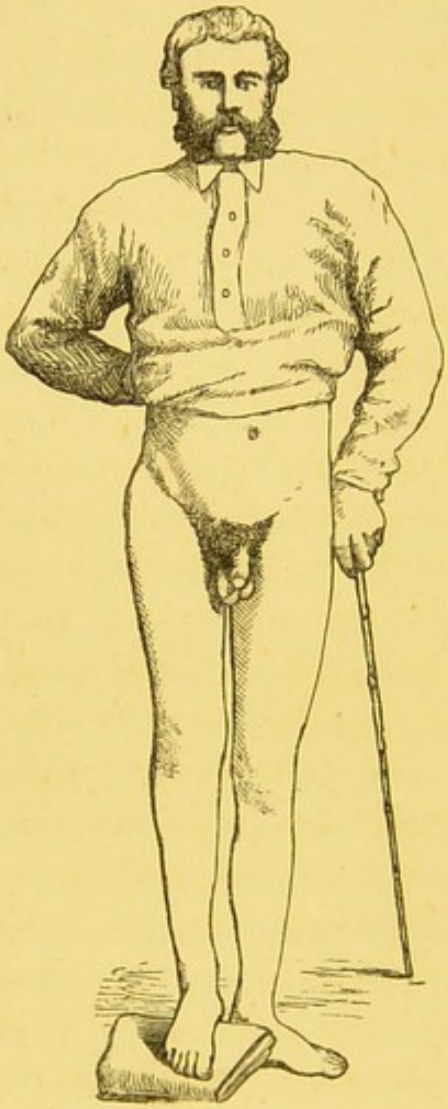

Fig. 33.

Fig. 34.

Case 16.—J. T., æt. 5, had suffered from symptoms of the disease for several months. Signs of suppuration, with deep fluctuation over the joint, were well marked. On the 30th of May 1873, an exploratory incision was made, and the head of the femur was sawn off. The cartilage was destroyed at several points, and the bone underneath was soft and inflamed.

The acetabulum was not involved. This patient made a good recovery, and left the hospital about four months after the operation with a useful limb and with free movement of the joint.

CASE 17.—J. U., æt. 6, had suffered from symptoms of the disease for six months. The symptoms followed a fall and injury to the joint. There were signs of suppuration, and deep fluctuation could be felt over the articulation. On the 15th of January 1874, an incision was made, and the head of the femur excised, as it was found to be diseased. A portion of the lip of the acetabulum was also diseased, and was gouged away. Her recovery was good, and she was dismissed on the 31st of March with a useful limb and with free movement of the joint.

CASE 18.—E. J., æt. 16, had suffered from symptoms of the disease for about three weeks, the symptoms being the result of an injury of the joint. Rest and blistering had been employed, but gave no relief; and when admitted, there were signs of suppuration of the joint, and great local and constitutional irritation. On the 29th of August 1874, an exploratory incision was made, and the head of the femur excised after an examination had determined that it was diseased. Almost the entire cartilage of this bone was found to be destroyed, as is illustrated in Fig. 1, which I referred to as an example of acute disease. The cartilage of the acetabulum was in some parts also destroyed. Her progress was most satisfactory, and, on the 10th of December, she was sent to the Convalescent Hospital with a useful limb and a movable joint. One year after the operation, the photographs from which Figs. 35 and 36 are copied were taken. The limb was about two inches short, but was strong and very movable at the hip.

CASE 19.—G. S., æt. 12, had suffered from the disease for eighteen months, and had been treated locally and constitu-

tionally without effect. Three months before admission, an abscess formed in the groin, and a sinus resulted, which continued to discharge freely, the patient becoming much weakened by this constant drain. On the 21st of May 1875,

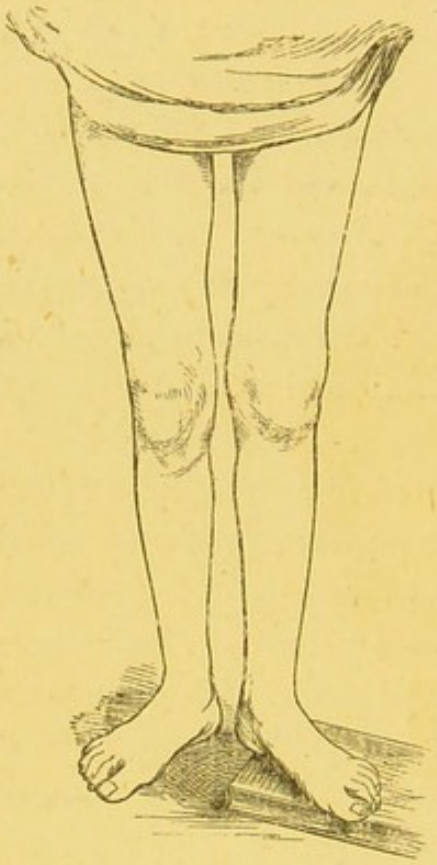

Fig. 35.

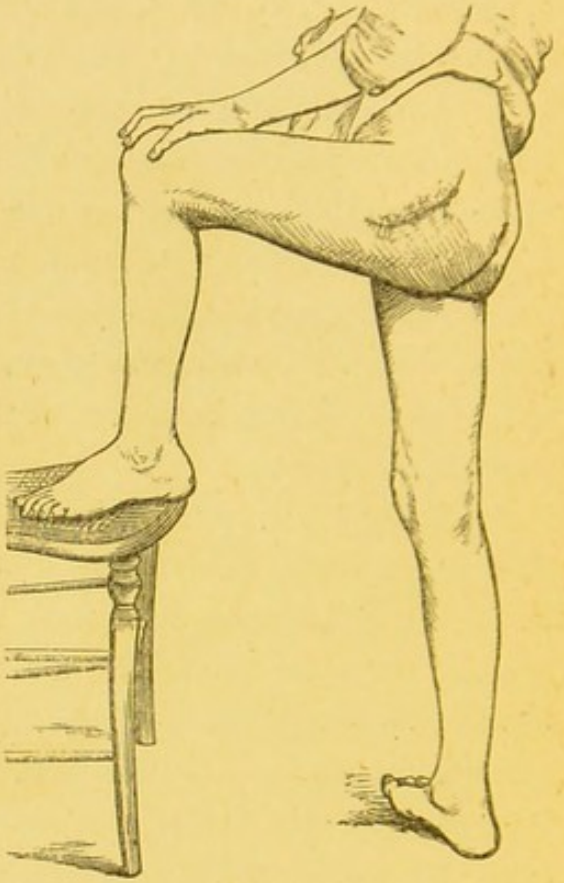

Fig. 36.

I made an incision so as to examine the joint, and finding the head of the femur diseased, I sawed it off. The entire cartilage and much of this bone was destroyed, and the acetabulum was also extensively involved. Having removed some loose sequestra in connexion with this cavity, I applied the gouge to several points which felt diseased. His progress for two months was good, but after this the discharge did not diminish, and the surface of the wound became unhealthy in appearance. He became gradually weaker, and died on the 25th of September. The examination of the joint after death showed that the femur had become rounded off, as usual, and

was healthy, but the acetabulum was much enlarged and extensively diseased, and there was an opening through its floor communicating with the pelvis. The rounded end of the femur rested against the opening of the acetabulum, and appeared to have prevented the discharge escaping properly

Fig. 37.

from this cavity. In Fig. 37 is illustrated the femur lying in position against the acetabulum, and in Figs. 38 and 39 the bones are shown separated.

Case 20.—A. T., æt. 5, had suffered from symptoms of the disease for six weeks, after a fall on his hip. There were signs of suppuration, and great pain was complained of when pressure was made over the great trochanter. On the 29th of June 1875, an exploratory incision was made into the joint, and pus discovered, with caries of the under surface of the neck of the bone. The head of the bone was therefore sawn off close to the trochanter. A section of the bone is illustrated in Figs. 5 and 7. The patient's progress after the operation was

excellent, and he recovered with a freely movable and useful limb.

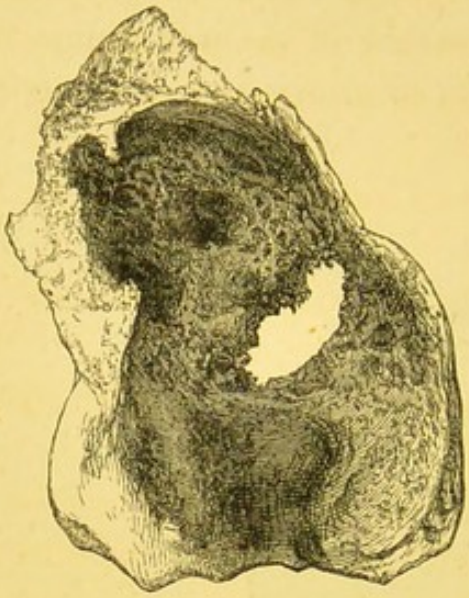

Fig. 38.

Fig. 39.

Case 21.—R. J., æt. 13, had suffered from the disease for fourteen months, and had been treated by extension and rest for two months without relief. Bed-sores formed, and the general health became very bad. On the 26th of July 1875, excision of the head of the femur was performed, as there were well-marked signs of disease of this bone. His progress was never very satisfactory. The bed-sores gave great trouble, and from the effects of these and the operation he gradually became weaker, and died on the 11th of September. The joint could be freely moved without pain before death.

Case 22.—J. P., æt. 7, had suffered from the disease for more than two years, and had been treated by rest and extension, which gave only temporary relief. Suppuration, however, took place, and an abscess was opened antiseptically. The patient making no progress after this, the wound was enlarged and the joint examined on the 27th of September. The head of the femur was found to be in great part destroyed, and the acetabulum was enlarged, deepened, and

carious at several points. I excised the remains of the head, the neck, and great trochanter of the femur, and also removed some loose sequestra in connexion with the acetabulum. After the operation, the patient's progress was very satisfactory, and he made an excellent recovery, with a perfectly movable joint.

The results of my twenty-two cases of excision of the head of the femur are as follows :—

Fourteen recovered completely, with a useful limb and movable joint.

Three recovered from the operation, but died within eighteen months from visceral disease.

Five died; one fifteen months, one twelve months, one eleven months, one five months, and one two months after the operation, from the combined results of the operation and visceral complications.

It will be observed that no case died from the *immediate* effects of the operation.

These results contrast most favourably with those published by other surgeons; and there are two causes which I consider have contributed to my success in this operation. These causes are—1*st*, The employment of antiseptic treatment; 2*d*, The performance of the operation at an early stage of the disease.

The employment of the antiseptic precautions, originated and practised by my esteemed colleague Mr Lister, is now so much a matter of course in my surgical practice, that no special reference is made to it in the brief notes of the cases reported.

From a study of my more extended notes of these cases, I find that thirteen of the twenty-two were treated antiseptically, and that *all* of these made a complete recovery. The nine remaining cases were not treated antiseptically, four of them being treated before antiseptics were used in my wards,

and the other five, being complicated with open sinuses or bed-sores, could not be satisfactorily treated in this way.

Accordingly, thirteen cases were treated antiseptically, and nine non-antiseptically. All of the former recovered; all of the latter, except one, are included in the unsuccessful cases, classed under the second and third series.

These facts are important in connexion with antiseptic surgery, and also in connexion with the early performance of the operation; for in the non-antiseptic and unsuccessful cases, the disease was, in the great majority of them, more advanced than in the successful ones.

In regard to the second cause, I have to remark that, in seventeen of the cases, no external sinus existed, although there were signs of, and suppuration in all. Out of these seventeen, four were unsuccessful; but it is most interesting to note that these four were among those treated non-antiseptically. In the remaining five, external sinuses existed, and all of these were unsuccessful, except one.

What cases, then, of "hip" disease are suitable for operative interference? Hitherto, surgeons have usually hesitated to perform excision in cases of hip disease until the disease was in an advanced stage, and external sinuses existed. The chief reason for this delay has, in my opinion, been the uncertainty as to the real condition of the joint, and also some uncertainty in regard to the exact pathology of hip disease.

The general practice has been to open abscesses, keep the joint at rest, attend to the health, and wait until the disease has further developed itself. Then, and not till then, has the question of excision been considered. No doubt, some cases treated in this way recover with limbs more or less useful, and joints more or less stiff; but most surgeons are agreed as to the fatal nature of cases of suppurating hip disease, and also as to the results of such favourable cases being less satis-

factory in regard to the mobility and usefulness of the limb than those following successful excision.

Now that we have in an antiseptic exploratory incision a certain and safe means of diagnosing the exact condition of a diseased hip or other joint, surgeons have no longer an excuse for not acquiring a sure knowledge of the disease; and if my observations as to affections of the head of the femur being the most common origin of hip disease be correct, the natural practice certainly is to remove without delay the source of irritation, when it has been examined, and its state correctly discovered.

I advocate, then, an antiseptic incision in all cases of hip disease in which signs of suppuration are present; and if an examination of the joint by this means determines that destruction of the articular cartilage of the head of the femur and caries of the bone exist, I advise the immediate excision of this bone, believing that the removal of this bone will in the large majority of cases check further disease, and allow the patient to recover with a useful and movable limb. Should the disease be limited to the head of the femur, and not involve, or only affect slightly, the acetabulum, it is, in my opinion, only necessary to take away the head of the bone by sawing through its neck. If more than the head of the femur is affected, or if the acetabulum is deeply involved, then it is advisable to take away the great trochanter as well, in order to allow the free escape of pus from the acetabulum, or from the pelvis, if the former should have become perforated.

Cases of acute and rapid disease of the hip-joint have generally been considered unsuitable for the operation of excision, but the complete success obtained in case 18, which was a most acute form of the disease, proves that this idea has been erroneous.

When the antiseptic examination of a suppurating hip-

joint determines that the articular cartilage and bone are unaffected, or only slightly involved, the excision of the bone will not be required; for a careful antiseptic treatment of the wound, with perfect rest of the joint, will, I believe, result in a good recovery in most cases. If, however, the articular surfaces are markedly involved, I strongly advocate excision, as I do not believe that even the use of antiseptic treatment will cure disease of the cartilage or bone, when it has once become thoroughly established, so as to leave a movable joint.

The excision of the head of the femur in more advanced cases of hip disease, and where external sinuses exist, although not so favourable in its results as when performed in the earlier stages of the disease, is a proper and justifiable operation; and I believe that even in these cases much may be done to lessen the mortality by thoroughly scraping the lining membrane of the sinuses according to Volkmann's plan, and then dressing the wound antiseptically. In such cases it is important to take away the diseased bone freely, so as to remove as completely as possible all source of irritation, and also to allow the free escape of pus from the acetabulum or pelvis.

Before performing excision in any case of hip disease, it is essential to ascertain the condition of the internal viscera. Should these be seriously diseased, operative interference is not advisable; but I do not myself consider slight and inactive affections of these viscera as necessarily a bar to operative interference, especially if the local disease is causing profuse discharge or irritation.

CHAPTER III.

METHOD OF OPERATING AND AFTER-TREATMENT.

Abscesses connected with hip disease require to be opened in the most suitable situation, and external sinuses enlarged if need be; but when making an exploratory incision into a suppurating hip-joint, I find it most convenient to enter the knife immediately above, and in a line with, the posterior margin of the great trochanter, and to make an incision long enough and deep enough to allow the finger to pass into the joint. If, then, it is considered advisable to excise the head of the femur, sufficient space will be obtained by extending the wound upwards and downwards for about two inches each way. Should the trochanter require to be removed, the incision should be carried downwards an inch or two more. If any portion of the acetabulum requires to be taken away, an incision across the centre of this longitudinal one will best expose the cavity. Having in the incision advised divided the skin and cellular tissue, I introduce a strong probe-pointed bistoury, and cut across the attachments of the muscles close to the bone, saving their periosteal connexion as much as possible. This division of the muscles allows the head of the bone to be turned out to a sufficient extent, and its neck sawn through by means of a fine narrow saw. In this way the head of the bone can be removed with little disturbance of the surrounding parts,—a circumstance which must assist in making the resulting new joint more perfect.

If the trochanter and neck require also to be sawn off, the

division of the muscular attachments must be more free; but, even in this case, I think it of consequence to interfere as little as possible with the neighbouring tissues. Few or no arteries of any size are wounded in this method of operating, and it frequently occurs that not even one ligature is required.

In my early cases I found that the posterior flap of the wound had a great tendency to fall backwards, and so separate its edges; but the introduction of two or more button-sutures in addition to the ordinary superficial ones successfully counteracts this.

I have further to add, that I strongly advocate antiseptic precautions during the operation, and the antiseptic treatment of the wound afterwards, and also note the importance of having a free escape—by the use of drainage-tubes—of pus or other fluids from the deep parts of the cavity. In addition to the usual antiseptic treatment, I always apply freely to the exposed articular surfaces or bone De Morgan's solution of chloride of zinc.

The after-treatment of the operation is of the most simple kind, and consists in supporting the limb in the extended position with one or more sand-bags or pillows; or, if there is any tendency to contraction, drawing up of the limb, or painful startings, the application of extension by means of a light weight is useful. Gentle movements of the new joint should be commenced at the end of three weeks, unless there is any painful symptom or condition of the wound which forbids it; then the movements should be employed as soon as this condition or pain has passed off. When the wound is healed, or nearly so, the patient may be allowed to sit up and use crutches. In cases in which the limb was weak, I have used with advantage some form of wire or other splint while the patient was in the upright position, but in the majority of my cases this support was not required.

The time of recovery after excision of the head of the

femur varies according to the condition of the parts before the operation and strength of the patient. The progress is usually slow, and I should say that from four to five months is the average time that a case of hip-excision requires for its recovery. Should the wound be slow to heal, or should sinuses continue to discharge, a careful search with the probe or finger ought to be made; for portions of diseased or dead bone are frequently the cause of this condition, and their removal is necessary for the proper healing of the wound or sinus. When the patient is able to bear weight on the limb, it is necessary to add to the boot or shoe a raised sole of light material, in order to compensate for the shortening resulting from the operation. This shortening is usually from two to three inches.

My opinion on the pathology and operative treatment of hip disease may be briefly stated in the following resolutions:—

(1.) That although hip disease may commence in the synovial membrane or pelvic bone, it originates most frequently in the head of the femur.

(2.) That the early, sure, and safe detection of the exact condition of a diseased hip or other joint, when symptoms of suppuration are present or are doubtful, by means of an antiseptic exploratory incision, is a valuable improvement and aid in the treatment of joint affections.

(3.) That the early excision of the head of the femur, when diseased, is the treatment most likely to check the progress of hip disease, and to cause the patient's recovery, with a movable and useful limb.

(4.) That, therefore, when signs of suppuration exist in connexion with hip disease, an exploratory incision should be made, and the condition of the joint determined.

(5.) That if the articular surfaces are found to be unaffected, means should be used to favour the free escape of pus or other

fluid from the joint, and care taken to keep the articulation perfectly at rest.

(6.) That if the articular cartilage of the head of the femur is found to be destroyed, and the bone diseased, and the disease is limited to this portion of bone, excision should be at once performed by sawing through its neck.

(7.) That if the disease affects more than the head of the femur, this portion of bone, together with the neck and great trochanter, should be excised; and any diseased portion of the acetabulum also taken away.

(8.) That in all operations on the hip or other joints, antiseptic precautions should be carefully employed during the operation, and until the wound is healed, as this treatment is the most certain known means of lessening the mortality.

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