

ued discharge. It is for this reason that the operation is justifiable. More can be done in half an hour with the knife and saw, in the way of removing dead bone, than can be done by Nature in many years; hence I urge that it is the duty of the surgeon to exsect the joint, thereby removing the patient from the dangers attending long-continued suppuration. It would seem, to an un-biased mind, that the same therapeutical indications might be applicable to the hip-joint, so far as exsection goes, as to any other joint. In fact, it is my firm conviction that caries of the hip-joint, by reason of the impending danger of perforation of the acetabulum, requires more prompt and decided surgical interference than when it manifests itself in any other joint of the body. The operation is not only justifiable, but imperatively demanded. No less an authority than Prof. Syme has made the assertion that, "if the acetabulum be *carious*, the patient *must die*." We can therefore lose nothing by the operation if this be true, but will, on the contrary, invariably procure comfort for the patient. But the assertion is not true, for in the majority of cases, as shown by my own statistical table, the patients have had their lives saved. Nor is that all: we not only save the life of the patient by the operation, but we also restore form and motion to the limb. Of course you must not expect that every case of exsection will prove successful. In one case, the disease may be so associated with constitutional vitiation that a mere local operation will not eradicate it. In another case destructive processes may have gone on to such an extent as to preclude the possibility of removing all the diseased tissues.

In all such cases the disease will probably proceed to a fatal termination. But when the disease is chiefly local, the constitution not yet undermined, and its extent so limited as to admit of its entire removal by the knife, saw, and gouge, and when we can have the advantage of proper air and diet, I am certain that this operation, if performed at the proper time, offers the best possible chance for recovery.

It is now twenty years since I performed the first successful exsection of the hip-joint in this country. And at that time the operation was very severely censured by nearly the entire profession. But the numerous cases in which perfect success has been obtained have proved its feasibility, and it is now quite generally considered as justifiable. From this I now feel like

making the prediction that by the time the entire profession has accepted it as a justifiable operation, surgeons will know sufficient concerning hip-joint disease and its treatment to render the operation entirely unnecessary; for a thorough knowledge of its pathology, etiology, and very earliest symptoms, will lead them to such an early recognition of the disease as will enable them to treat it in a manner that will obviate the necessity of exsection. At present, however, we are obliged to perform the operation in those cases where proper treatment in the earlier stages has been neglected, and must therefore study the method in which it should be done. To this subject we shall turn our attention at the next lecture.

## LECTURE XXIII.

## DISEASES OF THE JOINTS.—MORBUS COXARIUS (CONCLUDED).

Treatment (continued).—Exsection.—History of the Operation.—The Operation described.—Mode of dressing the Limb after the Operation has been performed.—After-Treatment.—Tables of Exsections appended.

GENTLEMEN: The history of EXSECTION, for the relief of hip-joint disease, lies within the present century.

The possibility of removal of the upper extremity of the femur was first suggested by Mr. Charles White, in 1769; but the first surgeon to attempt the operation in morbus coxarius was Schmalz, in 1816. In his case the head of the bone was found loose, and simply required removal. The cases of Scritchling,<sup>1</sup> Hoffmann, Batchelder, and Klinger, were similar to that of Schmalz.

In 1818 Anthony White performed his celebrated operation, which has generally been referred to as the first successful exsection of the head of the femur in morbus coxarius.

From 1818 until 1845, it appears that the operation was performed by only two surgeons, namely: Hewson, of Dublin, in

<sup>1</sup> Scritchling's case was one of exfoliation and not exsection, and is the first case of this description ever reported, as far as I can discover. It occurred in 1720.—See "Philosophical Transactions" for 1742.

1828, and Textor, Sr., who operated three times prior to 1845—once in 1834, once in 1838, and again in 1839; all terminating unsuccessfully. Textor operated again in 1845, and the case terminated successfully, the man subsequently obtaining his living as a peddler.

Mr. Ferguson has operated five times, and with uniform success. One of his patients died two years after the operation, "of enlargement of the liver, after having experienced great relief from the proceeding."

Mr. Ferguson states ("Medico-Chirurgical Transactions," vol. xxviii.) that he has learned that Mr. Brodie performed this operation, and "the patient died within a few days after, the direct effect of that proceeding;" but Mr. Henry Smith, writing in 1848 (*London Lancet*), remarks that he has not been able to "obtain any accurate information respecting the correctness of this assertion." There is no doubt, however, that this surgeon did exsect the head of the femur at St. George's Hospital, about the year 1836, but, under what circumstances, and with what result, I have been unable to ascertain.

Carmichael, of Dublin, it has been supposed, performed this operation in 1820; but it is more than probable that the case has been confounded with an exarticulation for medullary sarcoma, which he made at that time.

In this country the operation attracted but little attention, until I published my first case in the *New York Journal of Medicine* for January, 1855. That was the first time the operation had been successful in this country.

Dr. Bigelow, of Boston, had performed the operation about a year before, but had not published the case. Dr. Bigelow's case terminated fatally on the twelfth day after the operation.

A case is reported in the *New York Medico-Surgical Reporter*, January 10, 1846, in which Dr. S. P. Batchelder, of this city, removed the head of the femur in 1845, under the following circumstances: A young man had been kicked upon his hip by a horse four or five years before. Severe symptoms followed; fistulous openings formed, and pus was freely discharged. Finally, dead bone was detected by the probe. The fistula was dilated with sponge-tents, and the dead bone removed by the forceps, which proved to be the head of the femur. After the operation the patient improved rapidly, and eventually recovered.

This could not be called a case of exsection, and therefore has not been included. I have heard that Dr. Parkman, of Boston, exsected this bone in 1853, but have been unable to obtain any particulars of the case. This leaves my operation in March, 1854, as the first in this country that terminated successfully. I have now performed the operation in fifty-nine cases, and the results may be seen in the tables appended to this chapter.

So much, gentlemen, for the history of the operation, and I will now show you practically how to perform it, and explain the various steps in the operation, and the mode of dressing the patient after it is performed, as we proceed.

This little patient you see before you was brought to the hospital some months since in a dying condition, having been found in a garret in Baxter Street. Her father had been dead for some time, and her mother was in a lunatic asylum. She had no friends or relations that could give any information of her previous condition, the cause of her disease, or how long it had existed.

At the time of her admission she was so nearly dead from exhaustion that an operation was not deemed justifiable.

Her health has greatly improved since she has been in the



FIG. 175.

hospital, but she is still in a most wretched condition, as seen in Fig. 175, from a photograph by Mr. Mason. This photograph had to be taken in the ward, as it was impossible to move her to the gallery, and therefore the picture is very indistinct.

She has laid in the position you now see her nearly all the time since she has been in the hospital, and it is impossible to move her in any manner without giving her the most intense pain. The thigh, as you see, is flexed, and strongly adducted across the opposite limb, and there are several sinuses through which the probe readily passes to necrosed bone.

We will now proceed to the operation, which is performed in the following manner: Administer an anæsthetic, and then place the patient upon the sound side. Next select a strong knife, and drive it home to the bone at a point midway between the anterior inferior spinous process of the ilium and the top of the great trochanter; then drawing it in a curved line over the ilium, keeping it firmly in contact with the bone, make an incision across to the top of the great trochanter, extending it not directly over the centre of the trochanter, but midway between the centre and its posterior border, and complete it by carrying the knife forward and inward, making the whole length of the incision from four to six or eight inches, according to the size of the thigh. In this manner a curved incision is made through all the soft parts down to the bone and *through the periosteum*. If you do not feel certain that the periosteum has been divided over the femur by the first incision, carry the point of the knife along the same line a second, and, if need be, a third time.

The first incision having been made, an assistant, by means of his fingers or retractors, draws the soft parts aside, and you come at once upon the great trochanter. Then, with a narrow, thick knife, make a second incision through the *periosteum only*, at right angles with the first, at a point an inch or an inch and a half below the top of the great trochanter, as the case may be, just opposite the lesser trochanter, or a little above it, and extend it as far as possible around the bone. Here, again, make sure that the periosteum is *freely* divided. Very often a thick involucrum will be present, and great care will be necessary in order to make the incision through the periosteum complete. Now, we have first a curved incision through the soft parts; and, second, a T-shaped incision through the periosteum at the point indicated on the outside of the femur, just above the lesser trochanter. At the junction of the two incisions through the periosteum introduce the blade of the periosteal elevator (*see Fig. 112*), and gradually peel up the periosteum from either side, together with its membra-

nous attachments, until the digital fossa has been reached. At this point the rotators of the thigh are inserted, and the attachments are so firm that you will not be able to peel them off, but will be obliged to divide them with the knife.

When dividing these insertions you should be very cautious and keep the knife close to the bone, making only a very small incision, as a branch of the internal circumflex artery lies very close to them, and, of course, must be carefully avoided.<sup>1</sup>

After the tendons have been divided, continue to elevate the periosteum upon either side as far as can be safely done without breaking it. You should aim to peel off the periosteum intact, and leave it as a perfect sheath after the bone has been removed, for the purpose of preventing any infiltration into the surround-

<sup>1</sup> The following note which I have received from Dr. J. A. Wyeth, describing the arterial distribution, I have deemed of such importance that I have added it as a foot-note: "The comparatively trifling amount of blood lost in an operation of such magnitude as the excision of the hip-joint, where there is no means of stopping the supply of blood to the part, has doubtless added very much to the remarkable success which has attended this operation in the hands of its author. The following synopsis of twenty dissections of the hip-joint, made with regard to the arterial distribution to this region, may serve to show the extreme nicety of execution requisite in order to avoid hæmorrhage that would always be annoying, and in some instances dangerous. The arteries found distributing branches to this region were the gluteal, sciatic, obturator, external, and internal circumflex, and the superior perforating by anastomosis; none of these approached the line of incision given by Prof. Sayre near enough to be divided before they broke up into branches of distribution too small to give rise to any noticeable hæmorrhage, except one of the terminal branches of the internal circumflex, sometimes mentioned as the trochanteric branch, but never described in connection with the surgical anatomy of this operation, to the writer's knowledge. In twenty dissections this artery was present in every case. In eighteen of these it came from the internal circumflex, passed between the quadratus femoris behind, and the obturator externus in front, and, turning toward the digital fossa, broke up into its terminal branches within from one-eighth to one-quarter of an inch of the insertion of the obturator externus into that fossa, anastomosing with the sciatic, gluteal, and external circumflex arteries. In two cases in which it failed to come from the internal circumflex, it was derived from the sciatic, and ran in the depression between the quadratus femoris and obturator externus to its usual distribution. This vessel varied in size from a crow's-quill down, oftener small than large, but in all cases of sufficient size at the distance from the fossa given above to interfere with the success of the operation if carelessly divided. As it is only at this point that the knife is used in the deeper structures (in cutting the tendons of the obturator externus out of its fossa) it behooves the young surgeon to guard against this danger by keeping the point of his knife 'well against the bone' as advised in the operation, and never to attempt to divide this tendon out of the fossa. The obturator externus muscle was occasionally observed to be inserted into the great trochanter, and not in the digital fossa."

ing tissues; and, also, to retain the muscular attachments for the future mobility of the joint.

When the periosteum has been removed as far as can be safely done, the leg is to be slightly adducted, and the head of the femur lifted out from the acetabulum.

In this manner that portion of the periosteum that could not be reached with the elevator is removed from the bone.

Here, again, you should exercise great care and turn the bone out only just enough to permit the finger to go behind it for the purpose of guiding the saw in its removal; for, if too free luxation is made, you will displace the periosteum too extensively, and the consequence will be a subsequent exfoliation of the bone thus uncovered. You will, therefore, uncover only so much of the bone as you wish to remove by the saw. This leads me to speak of another precaution: never remove the bone with anything except a saw, a chain or a finger saw being most convenient. If you attempt to remove the bone with the bone-forceps, its extremity will almost invariably be slivered and subsequent exfoliation will take place.

After the periosteum, then, has been removed as far as necessary, adduct the limb a trifle, depress the lower end of the femur to a slight extent, and lift the head of the bone out only just as far as is requisite to permit its removal with the saw, and then saw through the bone just above the trochanter minor.

Never saw through the neck of the bone and leave the trochanter major, for the reason that, if this large portion of the bone is not removed, it will prevent a free discharge from the wound, and in that manner cause retention of pus.

By removing the periosteum from the greater trochanter, you have carried all the muscular attachments with it, so that these are preserved; hence there is no necessity for leaving the bone, and by removing it you have made a free opening for the discharge to flow through.

It sometimes happens that the involucrum is so firm that the head of the bone cannot be lifted from its bed; and in two cases I have seen fracture of the femur produced by the efforts at luxation, preparatory to sawing off the bone.

In such cases, or in any case where luxation cannot easily be effected, so as to permit the finger to pass around the bone, saw the bone off without attempting luxation, and then it can be

lifted out by means of the forceps or the elevator. In such cases the operation is unusually tedious.

If, after this portion of the bone has been removed, it is discovered that living bone has not been reached, the periosteum must be further removed, which can be done by luxating the femur a little more, slipping the bone through it, like a turkey's neck after his head has been cut off, until living bone has been reached, no matter whether it requires one, two, three, or five inches of the bone to be removed.

I have seen one case in which nearly the entire shaft of the femur was removed and perfect recovery took place. In that case the operation was performed by Dr. Spencer, of Watertown, New York.

One great secret of success is to leave the periosteum entire. If the involucrum which usually surrounds the bone possesses sufficient vitality, it may be permitted to remain; but if it is at all deficient in this respect, as indicated by its appearing like carious bone, it must be removed.

Next the acetabulum is to be examined, and, if found diseased, all the dead bone must be carefully removed; if the acetabulum be perforated, this part of the operation must be performed with the greatest care, lest injury be done to the internal layer of periosteum. The internal periosteum will be found peeled off, or lifted away, so as to make a kind of cavity behind the acetabulum; and an exceedingly important point is to chip off all the edges around the perforation, down to the point where the internal periosteum is reflected from the sound bone. This is one of the most delicate steps in the operation, to be able to remove all dead bone from the wall formed by the internal periosteum without injuring or wounding it. In some cases, when the operation is completed, there will be nothing intervening between the finger of the operator and the rectum of the patient, except this internal layer of periosteum.

Another important point is to thoroughly clean the original sinuses, carefully removing all portions of dead bone which may have lodged in their course during the progress of the disease, as well as the false membrane which lines them.

If this precaution is neglected, much subsequent trouble in the way of continued discharge, and perhaps abscess, may arise.

When all the dead bone has been removed, wash out the wound

thoroughly, fill it full of Peruvian balsam and stuff it with oakum. The extremities of the wound may be closed with stitches, but the central portion, which leads directly to the acetabulum, must be kept open in such a manner as to prevent the possibility of the discharge becoming retained. For this purpose use a plug of oakum. Never plug the wound with cotton or lint, for they will not permit a free discharge from the bottom.

I have seen one case that terminated fatally, simply because the attending surgeon used cotton, thereby giving rise to retention of the discharge, and fibres of cotton were found among the granulations and deep-seated tissues, months after the operation.

Now the patient is ready to be placed in an apparatus which will secure absolute rest, and a proper position for a certain length of time. For this purpose, the most convenient instrument that can be employed is what is known as the wire cuirass. (See Fig. 176.)

This instrument is a modification of Bonnet's *grand appareil*, and consists of a strong wire netting, well padded inside.

The cuirass being properly prepared and well padded, the patient is laid in it so that the anus is opposite the opening, and free from any possibility of obstruction, when the well leg is the first to be dressed. This is done by making the leg perfectly straight and screwing up the foot-rest until it is brought firmly against the heel of the patient, placing a pad between



FIG. 176.

the foot and the rest to absorb the perspiration; the instep is then well padded with cotton or a blanket, and a roller is carried firmly round it and the foot-rest, running up over the limb; but before going over the knee a piece of pasteboard, or leather, or several pieces of folded paper, are placed over the leg, knee, and thigh, and the roller carried firmly over this extemporized splint for the

purpose of preventing the slightest bending of the knee, when the roller is carried up the entire length of the thigh, around the perinaeum and over the outer arm of the instrument, and several times back through the perinaeum, and then across the pelvis, by which means the well limb is made a firm counter-extending force.

Two strips of adhesive plaster, two to four inches in width, according to the size of the patient, are then placed upon either side of the operated limb, and secured with a nicely-adjusted roller over the foot and up the leg and thigh, as far as the abscesses on it or the wounds will permit, being careful to leave a sufficient length of the plasters at the lower extremity free, for the purpose of applying them to the foot-rest where extension is made. The foot-rest is then screwed up to meet the heel of the shortened limb, and these strips of adhesive plaster are brought down around the foot-rest and securely fastened. The foot-rest is then extended by the screw, slowly and gradually, at times waiting a few moments for the muscles to yield, which have been so long contracted, until the limb is brought down to its full extent. It sometimes happens that, from long contraction of the adductors and the tensor vaginae femoris, subcutaneous section of those tendons and fascia will be requisite before the limb can be brought to its proper position, even after the head of the femur has been removed. After the limb is brought into this position a roller is carried from the foot over its entire surface; a large wad of oakum is placed around the wound to absorb the discharge, and the roller is carried firmly over the wound, inner surface of the thigh, and around the pelvis. I place great importance upon this latter part of the dressing, as we thereby compress the tissues, and prevent the burrowing of pus, the oakum, which has already been placed in the wound, allowing of free drainage, no matter how tightly the roller may have been applied.

Immediately after the patient is dressed in this way, and has recovered from the anaesthetic, he is capable of being stood up against the wall, or riding out in a carriage or boat, and can take his daily exercise in this way. I have, in several instances, had patients removed a long distance, some miles, in fact, within an hour of the operation, and without the slightest inconvenience or pain. This dressing will probably not require to be changed for from forty-eight to sixty hours, or until secretion has been formed to

moisten the dressings, when the oakum plug can be removed without hæmorrhage. If this dressing does not come away easily, warm-water injections will readily float it out. The wound, made clean, is again filled with Peruvian balsam and dressed as before. After this it may require dressing once or twice a day, according to the amount of discharge, and the child should be removed from the entire instrument as often as is requisite. The well leg should be removed from the wire breeches at least once a week, every day is better, and free movements given to all the joints, ankle, knee, and hip, otherwise we may ankylose them, although they are not diseased. The wire cuirass should be used for from a month to two months, according to necessity, after which the patient can be put upon the long or short splint and allowed to exercise, thereby increasing his prospects of perfect motion in the new joint.

The reason for stuffing the periosteum with oakum is because we wish it to retain its proper shape, to mould the material thrown out for the formation of the new bone that is subsequently to bear the entire weight of the patient. If this precaution is taken, we may have a femur nearly as well formed as the original bone, and equally as serviceable.

It is impossible to pack the wound with oakum so that pus cannot escape through its meshes, hence it is the best substance that can be employed, for it permits free discharge from the bottom of the wound, and at the same time permits firm support to the surrounding tissues without endangering the life of the patient from absorption of pus or ichor.

Having completed the dressing, I will stand the patient against the wall (*see* Fig. 177), and I ask you to compare her present condition with what it was half an hour since (Fig. 175). It seems to me that every one who sees it must be convinced of the propriety of the operation. I have just now performed.

The long and short splints, and the modes of their application, have already been described, and, when the patient has recovered from the operation sufficiently to wear one of them, the after-treatment of the case is to be continued upon the same general plan as that which guides us in the treatment of cases where no operation has been performed. Fresh air, sunlight, and good food, are the great essentials. Tonics and other remedies may be

employed as each case may seem to demand. The wound should be kept thoroughly cleansed, and every precaution taken to secure a free discharge, so as to prevent the formation of abscesses in the surrounding tissues.

When the discharge begins to cease, you may commence passive



FIG. 177.

FIG. 177a.<sup>1</sup>

motions, and these should be regularly and systematically resorted to; slight at first, but gradually increased as recovery goes on.

If this treatment is faithfully persisted in, you will be able, in a majority of cases, to obtain a much more useful limb than Nature can ever produce when she is permitted to effect a cure according to her own method.

I will here insert the first successful case of exsection of the head of the femur performed in this country, republished in full from the *New York Journal of Medicine* for January, 1855, in order to show the improvements that have been made in operation and after-treatment since that time:

"On March 20, 1854, I was called, in consultation with Dr. Throckmorton, to see Ellen G., 297 Fifth Street, aged nine years, who had been suffering for eighteen months with morbus

<sup>1</sup> Fig. 177a is from a photograph of the same patient, seven weeks after the operation.

coxarius of the left hip, which was supposed to have resulted from a fall. She had been treated with issues, blisters, etc., together with the general tonic and anti-scorbutic remedies adapted to such cases; but the disease continued to progress, until an abscess was discovered, involving the whole upper front and inner portion of the thigh, accompanied with repeated chills, profuse sweats, and great prostration.

"When I first saw her, this abscess had pointed in two places, and was apparently just ready to open; the point nearest the surface and most fluctuating was near the anterior superior spinous process of the ilium, immediately in contact with the attachment of the tensor vaginæ femoris muscle, and Poupart's ligament. The other place of pointing was about five inches below the ligament, just over the femoral artery; pressure on any part of the upper portion of the limb distended both of these pointing abscesses, showing communication between them.

"The leg was shortened two and a quarter inches, and turned inward, *but not permanently fixed in its position* (as is usual), but allowing of considerable motion, which gave a distinct *bony crepitus* between the femur and ilium. The pelvis was twisted and drawn upward. Her general health had become much affected; she had lost her appetite, and was suffering from hectic, with constant chills and profuse sweats, and was rendered comfortable only by the constant use of anodynes.

"I advised a free opening of the abscess, and, if necessary, the removal of the head of the femur. At first this was objected to; but, as the child's health rapidly failed and death seemed inevitable, the father, in a few days, consented to the operation. Accordingly, on March 29, 1854, assisted by Drs. Throckmorton, Drake, Thebaud, Bauer, and Bertholf, I proceeded to perform it.

"I first laid open the abscess by a free incision of about six inches over the trochanter major, on the outer aspect of the thigh, and in a line with the femur, and then cut into the floor of the abscess (which principally occupied the inner and front portion of the thigh), and discharged about a pint of thin serous and flaky pus. The finger was then readily passed around the neck of the femur, and detected an opening in the capsular ligament on the inner surface of the neck. The upper border of the acetabulum had been absorbed, and the head of the femur was upon the dorsum of the ilium, near the anterior superior spinous

process, *surrounded by its capsule* (which seemed to have been slipped up), and a large deposit of bone, apparently being an attempt of Nature to make a new acetabulum. But the cavity thus formed had no lining membrane, as the femur grated roughly upon it. I then opened the capsular ligament on a line with the external incision, and disarticulated by bringing the leg strongly across the opposite thigh, and then, with a large pair of Luer's forceps, readily cut off the head of the femur.<sup>1</sup> The bone at this point appeared perfectly healthy.

"The upper rim of the acetabulum had been absorbed (according to the theory of Dr. March, of Albany), and the new deposit of bone, which was intended to supply its place, was denuded and carious. I gouged it off with a sharp, firm chisel, made for that purpose, and, in this way, took off a number of flakes of bone, until I came to a healthy, bleeding surface.

"The anterior superior spinous process on its outer surface, and the external lip of the crest of the ilium, was black and carious for some distance, and with the forceps I easily clipped it off until I came to healthy bone. Very little blood was lost in the operation, and, after cleaning away all the *débris*, I brought the leg in the straight position, filled the wound with tow, and dressed with a roller and cold-water compress. She was then put to bed, and a cup of strong coffee administered, after which she soon fell asleep.

"The child was under the influence of chloroform during the operation, which occupied nearly twenty minutes, and was perfectly insensible the whole time.

"The following extracts from my note-book, taken at each daily visit, exhibit the progress of the case:

"11 p. m.—Has slept occasionally and is quite comfortable; pulse 128; skin good; vomited freely about 4 p. m.

"March 30th, 10 a. m.—Passed a good night, without any narcotic, and slept about four hours; has had no chill; taken breakfast with a relish, and is surprisingly comfortable, considering the magnitude of the operation; pulse 120; no hæmorrhage; passed urine twice.

"31st.—Took half a grain of opium last night; slept well; pulse 120; skin good; removed external layer of tow; found small amount of pus.

<sup>1</sup> This is the only case in which I have made section of the bone with the forceps.

"April 1st.—Slight fever; heat of skin and thirst; pulse 130. Administered five grains Dover's powder, with addition of half a grain ipecac., every four hours.

"2d.—Has passed a good night, slept six hours, ate a good breakfast, and feels every way better, but is much more feeble. Dressed the wound; on removing the tow, found healthy pus in abundance.

"The abscess, which pointed at the anterior superior spinous process, being again full and fluctuating, I opened it, and gave exit to about a tablespoonful of tolerably healthy pus; pulse 140, and more feeble; directed to administer brandy and beef-tea more liberally; I do not think the family give sufficient stimulant or nourishment, as they are very strongly opposed to brandy, and are afraid of meat on account of fever.

"3d.—Slept well all night without opiate; pulse 120; bowels moved twice naturally; appetite good; finding great improvement follow a more nutritious diet I advised its continuance.

"5th.—Child very comfortable, amusing herself by cutting paper dolls; applied the straight splint for counter-extension to the well side, and made extension by means of the foot-board, bringing the limb down to the same length of the opposite one.

"7th.—Slept well, but much weaker, having had three loose discharges in the night, and some hæmorrhage from the nose, which was arrested by astringents and compress. Ordered brandy and laudanum, with more liberal use of iron.

"8th.—Diarrhoea not yet checked; the brandy and opium was not given, and yet the child is somewhat stronger than yesterday; pus more consistent.

"9th.—Diarrhoea checked; slept well; eats freely; discharge less copious and more consistent; pulse 120.

"10th.—Very comfortable; looks as if it will require a counter-opening on the front of the thigh, at the old place of pointing.

"14th.—I applied a compress and adhesive straps on the inside of the thigh.

"July 1st.—Dr. Throckmorton has seen the child daily since my last visit, and reapplied the bandage and compress, which has had a most salutary effect, and the abscess has the appearance of healing rapidly.

"10th.—I was again called to meet Dr. T. to-day, and found the child much prostrated from a severe attack of dysentery,

which had lasted four or five days; she is very much reduced, and, I fear, will not rally. The granulations are flabby, and pus thin and copious.

"August 1st.—The dysentery has been checked for some days; but the wound, which was nearly closed, has opened, and a small piece of ragged bone came away, which was probably some portion of the shavings or chips removed from the ilium, at the time of the operation, and which I had not been sufficiently careful to remove.<sup>1</sup>

"20th.—The child very much improved, but the fistulous opening, from which the piece of bone had escaped, remaining, and having rather a white and flabby appearance, I injected it with tincture of iodine.

"24th.—The injection has been followed by a smart attack of erysipelas, which has extended down some distance below the knee, and there is considerable constitutional disturbance.

"September 1st.—The erysipelas gradually subsided, but seems to have been of great service, as it has caused union of the walls of the abscess all around the thigh, and the small opening in the cicatrix is nearly closed, discharging a very few drops of healthy pus. The limb is still in the extending splint; but, on removing it, there seemed no tendency to retraction of the limb. The splint was reapplied; but the body was left free from the bandage, so as to allow of flexion, in order to prevent ankylosis.

"I might here mention that, for some weeks past, since about the 1st of August, at each dressing her body has been brought at a right angle with the thighs, having this object in view; and I have now permitted her to do it as often as she likes.

"November 1st.—I had not seen the case for two months, until to-day, when, to my astonishment, I found her walking on her crutches, which she has been able to do for some two weeks. Her limb appears the same length as the other, and she can flex and rotate it freely. I directed her to bear no weight upon it yet.

"20th.—To-day I placed her in the horizontal position, and

<sup>1</sup> "Since making this note, my impressions have been more confirmed, as two similar pieces of bone have been removed from different parts of the cicatrix, and have thus materially retarded the progress of the case; I should therefore advise great care, after the performance of this operation, that all *débris* and foreign bodies be carefully washed from the wound; and, in so large and ragged an abscess as this one was, it will require more care than any one would imagine, unless they had seen it."



measured her carefully, and find there is about one-eighth or nearly one-quarter of an inch shortening. By taking hold of the foot, the whole body can be drawn down in bed without pain in the joint, and a pressure may be made sufficiently strong to move the pelvis and body upward without producing any shortening of the limb. When she lies upon the back, with the leg extended upon the thigh, she can elevate the heel sixteen inches from the bed, and flex the knee so as to bring the thigh at a right angle with the pelvis; she can rotate it internally, so as to touch the other foot, and externally so as to touch the bed. Her general health is perfect, and the case has terminated quite successfully. The bone was examined microscopically, but no trace of tubercle was found."

Her present condition is as seen in Fig. 178, from a photograph.



FIG. 178.

As the cases of Roussell, Storch, and Schletting, are among the most perfect of my recoveries, and Field altogether the most distorted and shortened, I append them with photographs, as all the other cases of recovery present various grades of improvement between these extremes. I have also added the case of Matilda

Hillory, because it presents some points of interest, particularly the fracture of the femur at the time of the operation.

These, I think, are sufficient to prove the value and propriety of the operation without adding to the expense of the work by engraving any of the others, although many of them are nearly as perfect as Storch and Schletting.

CASE. *Excision of Hip-Joint; Removal of Three Inches of Bone, and a Portion of the Acetabulum; Reproduction of Bone to nearly the Normal Length; Recovery with Perfect Motion.* (See Table, No. 22.)—Adolph N. Roussell, aged nine years and six months, had hip-disease for four months, the result of a slight injury, received while recovering from a severe attack of fever. Suppuration soon set in, and, when I saw him, October 20, 1864, he presented the usual appearances of the third stage of hip-disease, the leg and thigh being well drawn up, and adducted across the other thigh. Several sinuses also existed, through which the probe readily passed to dead bone in the neighborhood of the joint.

A free incision was made over the trochanter major, connecting three or four of the sinuses, and giving exit to a large amount of pus. After the escape of the pus, the bones gave distinct crepitus on being rubbed together, and an opening was found in the capsule, on its inner and posterior boundary.

The capsule was laid freely open, and the incision carried down over the trochanter major, *fairly through the periosteum* (which was much thickened) to a point opposite the trochanter minor; the soft parts being well held apart by spatulas in the hands of Dr. James S. Steele (who was my only assistant in the operation, except my son, a lad twelve years of age), I made another incision through the periosteum at right angles to the first: this division through the periosteum was carried on either side of the first, as far around the bone as I could go, making the periosteal cut in the form of an inverted T ( $\perp$ ).

Into the angles thus made, I pressed my periosteal elevator (Fig. 112), which is a large and firm instrument, very much like the ordinary "oyster-knife." With this instrument the periosteum was readily peeled off, necessarily carrying with it all the muscles attached to it, which, in my judgment, is the most important feature of the operation, for upon this particular fact depends the future usefulness of the limb.

The cutting edge of the knife was only required to separate

the attachments of the rotator muscles in the digital fossa, behind the great trochanter. All the rest was peeled off with great facility on the external portion, and, the thigh being then firmly adducted across the other, the bone was easily luxated from the acetabulum, and peeled itself off from the internal layer of periosteum, which was left *in situ*, and thus made a continuous wall or layer of dense fibrous tissue, which prevented the burrowing of pus on the inner portion of the thigh.

The femur was then sawed off just above the trochanter minor, but, being still further diseased, it was easily pushed up through the periosteum, and again sawed off an inch and a quarter below this point; the limb then being reduced to its normal position, this cuff of periosteum was incised on its outer side, to prevent any pocketing of matter. Several pieces of bone were



FIG. 179.

easily removed with the forceps from the acetabulum, and the whole of the denuded surface thoroughly scraped.

After injecting the wound with warm water, to wash away all

*débris*, the patient was placed in the "wire-breeches," the wound filled with Peruvian balsam and stuffed with oakum, and the limb extended to nearly its normal length.

No vessels were tied in the operation. A few strips of adhesive plaster at either end of the incision, with a firm roller around the limb and pelvis, constituted the dressing.

From the day of the operation he began to improve in his general health. A very generous and nutritious diet, with a full allowance of ale, together with daily washing of the wound, filling it with oakum and Peruvian balsam, and always keeping the parts sustained by a well-adjusted roller to prevent the burrowing of pus, was the after-treatment.

After a few days he was able to be carried out to ride, wearing the wire-breeches. At the end of six months I applied my short hip-splint in the daytime, when he could exercise freely



FIG. 180.



FIG. 181.

with his crutches, and at night I kept up extension by a weight and pulley at the foot of the bed.

The sinuses all healed in about eight months, and at the end