SEVEN CASES
OF
EXCISION OF THE HIP COMBINED WITH
THE HOT-WATER FLUSHING METHOD;

PRIMARY UNION IN SIX.

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MORE than a year ago I had the honour to present to this Society a paper on "Primary Union after Excision of the Hip for Tubercular Disease," which was read on December 11th, 1888. The aim of that paper was to show that certain conclusions as to the nature of tubercle of joints which I had put forward in my Hunterian Lectures, if correct, ought greatly to modify the treatment of this disease hitherto adopted; further, that cases of advanced hip disease, if treated by excision on the principles there laid down, would give better results than any we had ever yet seen from operation, and probably also better remote results. Finally, I desired to show that after this operation, even for advanced disease, primary union of the whole wound ought to be the rule if done at the proper moment.

The case which formed the text of that communication was one of advanced hip disease, with destruction of the

head of the femur. I had selected it as a test of the correctness of the conclusions put forward. As was anticipated, the whole excision wound had healed by first intention throughout, without a drop of suppuration, and has remained soundly closed ever since.

Since writing the above this boy has been brought to me. He walked well, and without pain, ever since he was shown at this Society in December, 1888. He had recently had scarlet fever, and looked a little debilitated. Though he had no pain or trouble in walking the mother was a little uneasy on account of a small swelling which she had noticed a week before under the old scar, which was still perfectly sound and white. This I examined, and found quite painless, but distinctly fluid. I therefore admitted him into hospital, and cut into the swelling just external to the old scar. It proved to contain a few drachms of thin glairy fluid, and ran backwards in a thin track to the trochanter. There was no disease of bone to be detected. Apparently it was the result of liquefaction of some small focus of tubercle left behind in the first operation. The little cavity was scraped and washed out, filled with iodoform emulsion, and closely stitched up. It healed up by first intention, and after some days the boy was sent to the country on a double Thomas's splint. He is here to-night, as well as could be desired.

About the same time I read a paper at Brighton at the request of the local Medical and Chirurgical Society on the technique which I had adopted in securing this result, which was only briefly alluded to in passing in my other communication. The Brighton paper was published soon after in the 'Brit. Med. Journ.' for January 19th, 1889, and as it was considered to be too closely allied in its text to my other communication, the latter was not included in the 'Transactions' of the Royal Medical and Chirurgical Society for the year.

The object of the present paper is to offer for the consideration of the Society eight fresh cases in which excision of the hip was performed since then on the same

principles, with hot-water flushing. I desire in the first place to describe somewhat in detail the state of the joints and surroundings in each of these cases. For, apparently, there has been some misconception as to the stage of the disease in which my first cases were operated on. In reference to this point I wish to state plainly that I have never yet excised a hip-joint in the earliest stages of tubercular destruction, and never before a large abscess or abscesses threatened to come through the skin, and the head of the femur or acetabulum, or both together, were extensively diseased.

I have advocated operation at a much earlier stage of disease than that at which it has been the custom to resort to excision hitherto. But that is a very different thing from advising operation at the very earliest stages ; and I have never for a moment lost sight of the numerous cases which must occur in every surgeon's practice in which rest and suitable general treatment have been followed by a subsidence of the tubercular process in the hip, even when at first it looked very unpromising.

The cases selected for the treatment to be described presently have always been those in which, in spite of all the care which could be bestowed upon them during months of treatment, the bone has been steadily invaded and abscesses have formed, advanced gradually towards the skin, and threatened to burst through it. These are surely rightly called advanced cases. In such, if excision is performed in the limited way advocated, we only anticipate what will inevitably take place soon, namely, the bursting of the abscess. But our opening into the latter is made under the most favorable conditions, and having made it, we simply carry out a recognised surgical principle in evacuating all diseased material within our reach, be it bone or synovial tissue. But the merit of the technique employed is that this evacuation is made so thoroughly that it is safe to close up the wound on the spot *without drainage*, and look for union everywhere in the healthy structures left behind, a sound cicatricial tissue taking

the place of the diseased area, and all open sinuses being prevented.

With the exception of one case uncompleted at that time (No. 2 in the appended table), the cases now to be described are the only ones in which I have excised the hip-joint since the paper alluded to was read at this Society on December 11th, 1888. One of them ought not properly to be included in this series, for in it the conditions were violated which I venture to think must exist if we are to obtain perfect results; for the skin in this case had been allowed to grow so thin and inflamed over the underlying abscess that its vitality was damaged, and union by first intention was not be expected. Moreover, the abscess had been aspirated beforehand probably with a non-sterilised needle, for the track of the latter suppurated independently. The joint, therefore, before the operation had true suppuration grafted on to the tubercular caseating process, and primary union in a suppurating wound was not to be looked for. But I have included this case in the series for completeness' sake and to avoid all cavil. The patient was at all events immensely benefited by the operation, although primary union of the wound did not take place. All the other six cases healed by first intention and have remained sound ever since, as you have seen. I had hoped to produce all seven cases to-night for your inspection, but the first boy, Case 3, I have been unable to trace from the time he left the convalescent home. This is perhaps due to the fact that his mother, a very worthless individual, had borrowed money from the sisters at the hospital and has kept away ever since.

In all these cases the technique of the operation has been the same. I should be sorry even to suggest that it is not capable of being improved upon. But after considerable experience of the older and newer operations, and of various methods of wound treatment, I know of none which seems calculated to give better results. Briefly described, it consists in opening the abscess round the joint by the anterior incision of Mr. R. W. Parker, then

introducing the flushing gouge which I have specially designed for the purpose, and thoroughly flushing and scraping the abscess with sterilised hot water. What remains of the head of the bone is then sawn off, extracted, and the cavity of the joint proper is flushed clean with the gouge which has again been introduced. Then the acetabulum is gouged until all diseased material has been removed, the *débris* being carried away by the stream of hot water rushing in and out vigorously during the whole procedure. Finally all the ramifications of the abscess cavity are similarly scraped, cut, and washed until the escaping water runs perfectly clear. The whole wound is then sponged dry and filled with iodoform and glycerine emulsion; then all the stitches are inserted, but before being tied any superabundant emulsion is pressed out. They are then knotted without any drain-tube being left in, pressure being kept up on every part of the wound until the last moment. Plenty of salicylic wool packed carefully round every part of the joint and thigh completes the operation, which will take about twenty to forty minutes. The child is at once placed upon a double Thomas's splint previously fitted, the limb being kept strongly abducted. How long it ought to remain upon this we do not yet know, but the time in my own cases has ranged from seven weeks to six or eight months. I am inclined to think that for a case of average severity four or five months will be the best time. They can leave the house on the splint in about a fortnight, and enjoy open air carriage exercise from this time on. When one compares these results with even the best secured by any of our older operative methods surely it must be admitted that a step in the right direction has been made.

The cases in the order of their occurrence are as follows:

CASE 3.—James R—, æt. 7 years, a boy “who had never been strong,” but had had no definite previous illness, was admitted into University College Hospital on Novem-

ber 1st, 1888. He was a thoroughly neglected, miserable-looking child, and came to us straight from Lambeth Infirmary. The mother was strong and healthy ; the father was not so, but had died of some injury to the bowel. About a year before admission the child was first observed to limp, and was treated for hip disease at one of the London hospitals for some weeks. From the onset he had severe pain in the joint, preventing sleep. The treatment lately at the infirmary had been weight extension, and a splint for a couple of months. When he came to us the right thigh was much flexed, abducted and rotated out. Over the joint in front and externally was much swelling ; the skin was reddened, the veins dilated, and there was deep fluctuation.

On November 2nd a large quantity of broken-down matter was aspirated from the abscess in the joint by one of my colleagues, and four ounces of iodoform emulsion was injected ; the patient was then placed upon a double Thomas's splint. After this the abscess soon filled again, and the skin became more thinned and discoloured.

On November 4th I excised the joint by the method and with the details described above. I had, however, but little hope of securing primary union in the wound on account of the damaged condition of the skin and underlying tissues, which were, as stated, inflamed, thinned, and discoloured. But I was anxious to see whether the flushing with hot water gave better ultimate results in the worst cases than our older methods of clearing out the diseased structures.

Both the head of the femur and acetabulum were found to be extensively diseased, the former being so deeply buried in the latter that for some time I thought there was a carious opening into the pelvis through which the remains of the neck had passed. But this was not the case, although the socket was very extensively diseased. What remained of the head was sawn off close to the trochanter, and the acetabulum was cut clean with the flushing gouge ; the latter was also used to cut and scrape all the diseased tissues from the affected area.

When the water ran clean the wound was closed as described without drainage.

The Registrar's description of the parts removed is as follows:—"These consist of the head of the bone. The central cancellous tissue is almost completely destroyed, so that the head consists only of a cup-shaped mass of soft bone. The articular surface is almost completely devoid of cartilage, being covered with soft, pinkish granulation tissue having around some remains of the cartilage. A large ragged strip of partly destroyed cartilage is quite separated, and lay loose in the acetabulum. No sequestrum, but a considerable quantity of spongy living bone was scraped from the acetabulum, together with a small amount of pale pulpy granulation tissue."

The day after operation there was considerable pain in the joint, and the temperature rose to 102.8° at 3 p.m. It then slowly fell to 101.6° at 11 p.m. Next day, when I dressed the wound and with a probe gave exit to $\frac{3}{4}$ or $\frac{3}{8}$ of serum, it stood at 102.4° again. After this it fell again; and though it rose somewhat for several days there was nothing in the boy's general condition to excite uneasiness. On the third day I dressed the wound once more, and found that much serum had soaked through. After a few days it was plain that the edges of the incision could not unite, and a boracic fomentation was applied. This was changed for a sal-alembroth gauze dressing a few days later.

All this time the patient was steadily improving, and on the sixteenth day he was taken out of bed and placed in a chair by the fireside. On the fifteenth day the aspirator puncture was found to be suppurating, suggesting that the joint had been infected by the needle in the first instance. A month after operation it is noted that the wound is "healing up well, though still discharging." At this time the child suffered from a splint sore, but gained strength nevertheless. On January 9th there was more discharge, and a probe went straight down for an inch and a quarter.

On February 15th the patient went to Eastbourne, having picked up considerably in flesh. There was occasionally a moderate amount of discharge in the middle of the scar.

When he returned from the convalescent home he had improved very much indeed in flesh and colour, but there was still a small sinus and a little discharge. We have been unable, as I stated, to trace this boy further in spite of several efforts.

This is the *only* case of the series in which union by *first intention did not take place*. The tubercular process, however, appeared to be extinguished by the operation, and from the state of the joint and sinus when last seen the part is probably healed by this time.

CASE 4.—Isabella L—, æt. 9, was admitted into University College Hospital on September 11th, 1888. She was a fairly healthy-looking child, with no history of any illness except measles. The family history was also good. Nine or ten months before the patient fell upon her left hip and hurt it, and was consequently confined to bed for a few days. About two months before the *first* admission she began to limp, and the movements of the left leg were noticed to be restricted, with abduction and eversion; pain was also complained of at the same time in the hip, and later in the knee. On admission there was flexion, adduction, and internal rotation with marked lordosis. There was distinct fulness in front and to the outer side of the joint, but no pain on pressing the trochanter and no increased heat. The pelvis was tilted up on the left. There was no appreciable shortening. By extension with weight the deformity was corrected, and the patient was soon able to go home on a double Thomas's splint. The temperature was usually a little elevated, being, as a rule, above 99°. On November 19th, 1888, she was re-admitted, as the disease was manifestly extending. There was now more fulness over the joint in front, with tenderness on pressure. The trochanter was swollen, and on

pressing the bone towards the acetabulum it went in with a distinct jerk as if the head had been half dislocated, and grating was then felt plainly. On January 4th the fluctuation over the joint is noted as very distinct, and on this day I aspirated a quantity of curdy matter.

The abscess still increasing, I operated as described above on January 8th, 1889, six months after the onset of the disease. On opening the abscess about three ounces of its yellowish-brown contents spurted out. The head of the femur was sawn off close to the trochanter, and the extensively carious acetabulum was gouged clean with the flushing gouge carrying a stream of hot water. The abscess was now found to extend inwards under the rectus muscle and great vessels, and downwards in the thigh for about five inches. All its ramifications were thoroughly scraped and flushed at the same time, and much tubercular matter was evacuated. The wound was now closed without any drainage, and dressed after the usual toilet, a double Thomas's splint being applied with the limb abducted.

The parts removed are thus described in the Registrar's report:—"The cartilage is completely separated from the head of the femur except a few loose strips hanging round the margin. The surface of the head presents soft vascular rarefied bone, covered in parts with pale, soft, pulpy granulation tissue. The saw section of the neck appears normal, but is very vascular."

Little more need be said; the wound healed by first intention without any complications. The highest temperature was 101.2° on the day after operation. The first dressing was on the ninth day, the stitches were all removed on the fifteenth day, and the patient left for the convalescent home two days later. When she returned she was in excellent health, and there was no tenderness or pain about the joint. In May she was shown by Mr. Raymond Johnson at the Clinical Society for me; there was then considerable movement in the joint, and no deformity except slight shortening. She was kept on the splint for about eight months and then allowed to walk,

which she now does well. There is about an inch and a quarter shortening, and a slight tendency to rotate the toe outwards, and very slight flexion and adduction hardly noticeable.

In this case the operation was watched with interest by several surgeons of large experience, including Mr. Pick, Mr. Croft, Mr. Macnamara, and Mr. R. W. Parker, and Dr. Whittle, of Brighton, who were particularly struck by the extent of the disease and the awkward position of the abscess under the great vessels of the thigh.

The next two cases I was invited to operate on by Dr. G. Whittle at the Alexandra Hospital for Children at Brighton, to demonstrate this method of procedure to a number of his medical friends.

The first of them (George L—, Case 5) I thought was in a most unfavorable condition for testing the method. The patient was a very unhealthy boy with a bad family history. For six months he had been suffering, and for three of these there had been an abscess in and around the hip-joint. When I first saw him I demurred about subjecting the method to so severe a test, especially as I was particularly anxious to demonstrate the benefits of primary union in these first cases. The thigh was greatly enlarged, and the skin was red and congested; the state of things was more that of an acute abscess than what we usually see. I explained that it was highly probable that the wound would not heal or would soon break down again. However, the operation was performed just as in the last case. But there was much more difficulty in clearing out the tubercular matter, which had more widely infiltrated the tissues round the joint than in any previous case. It was particularly difficult from the fact that the tubercular infiltration was still in great part semi-solid, not having everywhere undergone liquefaction. The head of the femur and acetabulum, which were extensively diseased, and all the infected area, were gouged and flushed. The rest of the treatment was as in the other cases. The parts removed are preserved.

When I next saw the boy on the fourteenth day, up to which time the dressings had not been touched, the whole wound was soundly healed without a drop of pus, and has remained so ever since.

CASE 6. Winifred S—, æt. 5, did not look in so unfavourable a condition as her fellow patient. But as it turned out besides a large anterior abscess the acetabulum was destroyed and perforated so that I could put my index finger into an abscess within the pelvis, and then discovered a small loose sequestrum the size of the tip of the little finger. The head of the femur was half separated already from the neck, besides having nearly all its cartilage loose on its carious articular surface. This operation was done like the last. The anterior abscess was found to extend for several inches down the thigh; when it had been treated the joint was attacked. Then the neck of the femur was sawn through and the head was removed. The acetabulum was next widely gouged, especially the hole at its fundus leading into the pelvic abscess. Through this aperture the gouge was introduced, and the cavity was scraped thoroughly and flushed with the hot water at the same time. The sequestrum (shown) came away with the latter. Other details as described. The parts removed are preserved.

I next saw the patient on the fourteenth day after operation and removed the first dressing. The wound was soundly healed without a trace of discharge, and has remained so up to the present.

CASE 7. George J—, æt. 11 years, was admitted into University College Hospital for the present affection on April 10th, 1889, having previously attended the Out-patient Department for some months. His family history was not good, and he himself has nearly always had a cough, and at one time is said to have suffered from "consumption of the bowels."

Six months before admission the patient began to limp,
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and complain of stiffness in the left hip on walking. He became at the same time very thin and weak. On March 11th I had him placed upon a double Thomas's splint. On April 3rd a swelling was noticed on the front of the thigh, below the anterior inferior spine of the ilium. When admitted he complained of pain in the upper part of the thigh. The only trace of deformity was a little adduction with slight elevation of the pelvis on the affected side. There was distinct fulness in front and to the outer side of the joint, and the hollow behind the trochanter was slightly filled up. No fluctuation could be obtained in the swelling, nor was there pain on striking the heel. But when the trochanter was pressed inwards he complained. There was considerable limitation of flexion, but no alteration in length of limb. On April 28th he was sent to the convalescent home on a double Thomas's splint. Up to July 18th there was no increase in the swelling, but when seen on September 2nd, enlargement of the abscess, fluctuation and redness of the skin, with dilatation of its veins were discovered by Mr. Johnson, who was seeing my out-patients. The limb was now fixed in slight abduction, and there was half an inch shortening. As the abscess threatened to burst, he was re-admitted under my care, and on seeing him it was determined to anticipate this by operation. On September 3rd excision was performed as in the other cases above described. A large abscess was opened first, which extended into the joint, and down the thigh from under the tensor vaginæ femoris on the outside, across to its inner side superficial to the rectus muscle. In the joint there was a large amount of tubercular matter. The head of the bone was sawn off, and the acetabulum, which was very extensively diseased, and hollowed by large pits, was gouged and flushed. The remaining details were as in the other operations.

The highest temperature after this was 99.4° , and there was no pain. The stitches were removed on the thirteenth day; complete union by first intention was found

everywhere. The wound has since remained quite sound, and the boy has grown fat.

The head of the bone was so diseased as to crumble away during removal ; no detailed description of it, therefore, can be given.

CASE 8. Emily S—, æt. 9, a fairly healthy-looking child, with a good family history but very bad hygienic surroundings, was admitted into University College Hospital on February 19th, 1890. Eleven months before she had been an in-patient with symptoms of hip-disease on the right side, *i. e.* limping, and screaming at night. In the preceding October she was again re-admitted on account of swelling over the joint, which has been steadily increasing in spite of continuous treatment on a double Thomas's splint.

On admission on February 19th, 1890, there was considerable general swelling about the right hip but no œdema, redness, or fluctuation. There was slight flexion and distinct adduction but no rotation, There was pain on passive movement. Temp. $99\cdot4^{\circ}$ to $100\cdot4^{\circ}$.

On March 11th it is noted that the "general tenderness and to some extent the general swelling has subsided," but "below the outer half of Poupart's ligament deep fluctuation can be distinctly felt and there is slight œdema with some dilatation of the superficial veins, but the deepest pressure gives rise to no pain."

During May she began to cry out frequently during sleep, and at the end of the month there was half an inch shortening (there was no shortening on admission), the abscess was also more fully developed.

On May 23rd I excised the joint as described, evacuating first about three ounces of curdy material, and then removing the head of the femur and the diseased tissue of the acetabulum which was pitted all over with cavities containing granulation tissue. After the usual flushing the cavity was filled with iodoform emulsion and completely closed without a drain-tube.

The head of the femur was found to have its "cartilage destroyed except a few spots around its periphery." The "soft cancellous bone was exposed and covered with granulation tissue."

The first dressing was on the twelfth day, when perfect primary union was found and the stitches were removed. A few days after this she had measles, but without any ill effect on the joint, which has remained soundly healed until now.

The temperature during the first twelve days after operation only once touched 100.6° and then became normal.

CASE 9.—Ellen T.— Left hip diseased about twelve months before operation. Double Thomas's splint worn for about four months. Abscess began to form in front of joint some months before operation, and steadily advanced.

On July 4th, 1890, excision was performed as above. The head was found extensively diseased, and the acetabulum much eroded. In the latter lay a small loose sequestrum the size of the tip of the finger. The head was removed, and the whole cavity gouged and flushed clean. Union was practically *per primam*, and the child left hospital on August 2nd. She is now quite well and fat, but still wears a double Thomas's splint. The highest temperature recorded in this case was 100° .

It may be suggested that these results are exceptional, and that we must not expect them to be the rule. This may be true if cases with open sinuses are operated on by this method; then, of course, we shall not get lasting union by first intention. And in instances in which the incision has to be made through thin blueish skin we shall probably fail to obtain such results. But if we take patients in whom there are abscesses, however large (and in some of the cases before you they were very extensive) provided that the skin and subcutaneous fat be fairly

healthy, I do not see why we should not obtain as good healing in every instance. If it is possible to do so in a large proportion of cases now, it ought to be so in all as we go on improving the details of our technique. At all events it behoves us to try. And I hope to be able hereafter to justify the forecast made in my former communication to this Society, that before long we should have whole series of cases of excision of advanced hip disease where union by first intention had been obtained; and without any mortality. As a step in this direction I venture to bring forward this short series of cases to-night, and in doing so I promise that the patients shall be kept as far as possible under observation, and as long as possible, and that I shall ask permission to produce them here, whether well or ill, on some future occasion.

I do not expect to present them with the affected limb as long as its fellow; this would be impossible. Many cases of hip disease which have recovered without any abscess and without any operation show a stunted, shortened member. And if in addition to disease which has softened the head of the femur and acetabulum an operation has been performed we must of course have shortening. But I would like to point out that if the operation is done before all the capsular structures are destroyed by the disease we may expect a minimum of shortening. For this procedure as described does not necessarily damage the capsule except to the smallest extent. In it the anterior fibres are divided mainly outside the Y ligament where they are thin and unimportant. The rest of the capsular structures, if the disease have spared them, are left intact and capable of giving support to the femur. Nor are the muscles, nerves, or, more important still, the vessels injured in any way so that the nutrition of all the parts to be repaired is not impaired in the least.

In conclusion I may be permitted to reiterate that this procedure is not advocated to supersede the treatment by rest, general and local, together with the other usual remedies, for which I am the strongest advocate in all

cases so long as it can be carried out with benefit. It is suggested rather as a means of treating tubercular hips where these other measures have failed. And it is to be hoped it may supersede those older methods of excision which were not only immediately dangerous to life, but which, as we all know, gave most unsatisfactory ultimate results as to progression and symmetry. That the procedure is not yet by any means perfect is obvious; but having had many heart-burnings in the past regarding the former treatment of this large and distressing group of diseases, I offer this procedure as one which has given me for my own part better results than any which I have ever seen put in practice. It is, at all events, simple and safe, and gets rid of the use of dangerous germicides and of shock. I venture to think, therefore, that it is worthy of further trial.

The days of bad immediate results after excision of the hip are, it is to be hoped, past. Aseptic surgery has practically got rid of the wound infections which used so frequently to follow the operation speedily. And I hope, so far as my own practice is concerned, to have got rid by the method now advocated, of the chronic sinuses which were so frequently a source of danger.

I will only add in conclusion that for my own part all the dreary forebodings which used to occur to one when confronted by a case of destructive tubercular hip disease have ceased. Such a case can now be approached with tolerable certainty that the local disease can be thoroughly eradicated, and that the wound will be soundly and permanently healed in three weeks. We have still an immense amount to learn, but this is at all events something.

But I cannot close this paper without expressing the hope that we are not far from the time when the necessity for any operative interference with tubercular joints will be obviated by a more general recognition of the disease in its earliest stages, and a more intelligent and thorough treatment by rest, &c.

But so long as we have to operate on neglected cases, let us aim at doing so with the minimum of risk, suffering, and loss of time to the patient, and the maximum of benefit to the limb and general health.

Whether the method now offered for your consideration will assist us in this aim is a question which may be safely left for the friendly and impartial verdict of this Society.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' Third Series, vol. iii, p. 4.)

No.	Sex, age, date of operation, name.	Duration of subjective symptoms.	Duration of objective symptoms before operation.	State of parts found at operation.	Immediate result of operation.	Ultimate result of operation.
1	M., 5 years, July, 1888, right hip, Lawrence Taylor	12 months; splint worn 10 months before operation	Some months, during which large abscess formed in front of joint. No appreciable shortening	Anterior incision. Head of femur extensively eroded, and acetabulum also. Head removed; acetabulum gouged and flushed. No drain tube	Healed by first intention. Sutures removed on 13th day, and patient sent home on D. Thomas's splint	Splint removed 8 weeks after operation, and patient began to walk. 12 months later, patient running about without pain. Considerable mobility of joint; slight tendency to flexion. Wound soundly healed, <i>vide</i> p. 40. Patient shown at meeting quite well, and remains so. 7 weeks later readmitted with sinus at seat of drain tube. 17 months later this was dilated, and the acetabulum was found perforated into an abscess, which drained into the rectum. The other hip at this time also contained a large abscess. Not long after the child died of general tuberculosis and marasmus.
2	M., 6 years, July, 1888, right hip, Alfred Cannon,	12 months; D. Thomas splint worn 12 months	Duration not known. Large abscess in front of joint. No appreciable shortening	Anterior incision. Head of femur extensively eroded; acetabulum bare. A tubercular focus on sawn surface of femur gouged and flushed. Drain tube for 24 hours	Healed completely on 10th day, when stitches were removed, and patient was removed to Children's Hospital. The last dressing had been allowed to become soaked with urine and to become putrid. In this way the stitches were inoculated with septic matter, and ultimately suppurated in Children's Hospital	Boy got fat and strong, but still had small sinus, with a trace of discharge, when he left for the country. Cannot be traced since.
3	M., 7 years, 14th Nov., 1888, right hip, James Ready	12 months; splint worn only for 12 days before operation	12 months, during which large abscess formed in front of joint. Skin very much thinned and discoloured	Anterior incision. Head of femur eroded extensively, leaving very little to be removed; acetabulum deepened by erosion, and osteophytes around margin gouged and flushed. No drain tube	Healed, but wound slowly gave way again, the skin being so thin; an opening also found at old aspirator puncture	Boy got fat and strong, but still had small sinus, with a trace of discharge, when he left for the country. Cannot be traced since.
4	F., 9 years, 8th Jan.,	6 months; D. Thomas splint worn	4 months, during which abscess formed over front of	Anterior incision. Head of femur and acetabulum extensively diseased. Head	Healed per primam. Sutures removed on 14th day. Left hospital on	Wound remained soundly healed. Wore splint for over 6 months, then began

1889, left hip, Isabella Lowen	4 months before operation	joint. The head of femur had slipped partially out of socket, and could be pushed in with a click	removed and acetabulum gouged clean and flushed. The abscess extended down the thigh and under the femoral vessels to the in- side. It was thoroughly scraped and flushed. No drain tube	16th day wearing D. Thomas's splint	to walk about. 10 months after operation was in ex- cellent health, and the hip limb was soundly healed. The limb was shortened about $\frac{3}{4}$ in., and the foot slightly everted; the limb was per- fectly straight, and there was considerable mobility of hip. Cannot be traced.
5 M., 5 years, June 8th, 1889, left hip, Geo. Leaney	6 months	Over 3 months. Large abscess on upper and outer side of thigh. 1 in. short- ening	Anterior incision. Not much pus in the swelling, chiefly pulpy matter. Most of bone disease in neck of femur; acetabulum eroded. Head of femur sawn off, the rest gouged and flushed: no drain tube. D. Thomas's splint	Sutures removed 14th day; wound healed by first intention. Left hos- pital well in 3 months, wearing D. Thomas	24 months after opera- tion, joint looks quiescent. Wound quite sound when patient shown at meeting. ¹
6 F., 5 years, June 8th, 1889, right hip, Winifred Standen	9 months	6 months. Fulness about joint. No shortening. Deep seated fluctuation	Anterior incision. Large deep abscess opened. Head and neck of femur diseased, also acetabulum, and there was a perforation here about the size of forefinger into the pelvis. Head of femur sawn off, rest gouged and flushed: no drain tube. D. Thomas's splint	Suture removed 7th day; wound healed by first intention. Left hospital well in 4 months, wear- ing D. Thomas	Wore D. Thomas's splint, 6 mo. after operation. Looked remarkably well, and had grown very fat. Hip quite sound. Patient shown at meeting. In Dec., 1890, child received an injury of the hip, and end of Jan., 1891, a large abscess was found over outer aspect of limb about to burst; child walked about still notwith- standing. Abscess opened and flushed by Dr. Whittle. He writes, May 31st, 1891, that all is soundly healed and child is quite well.

¹ End of March, 1891, a mass of caseous material discovered under the skin over outer aspect of joint by Dr. Whittle, who excised it and obtained primary union of resulting wound. Writing May 31st, 1891, he says all is sound and the boy is in excellent position.

No.	Sex, age, date of operation, name.	Duration of subjective symptoms.	Duration of objective symptoms before operation.	State of parts found at operation.	Immediate result of operation.	Ultimate result of operation.
7	M., 11 years, Sept. 3rd, 1886, left hip, George Jeans	11 months; D. Thomas splint worn 6 months before operation	5 months before operation an abscess began to form in front of joint. $\frac{3}{4}$ in. shortening. Cutaneous veins dilated, and skin reddened over the abscess	Anterior incision. A large abscess cavity opened over the joint, extending under tensor vag. femoris and over origin of rectus. Head of femur much eroded, sawn off, and acetabulum extensively diseased; gouged and flushed: no drain tube	Healed per primam, and remained firmly healed. Stitches removed on 12th day. Left hospital on a day. D. Thomas's splint on 17th day quite well; limb perfectly straight	Boy rapidly improved and became fat. About a month or so after operation there was apparently some simple thrombosis of one of the large veins of the thigh, but this soon passed off, and gave rise to no trouble beyond swelling. Patient shown at meeting. Seen several months later quite well.
8	F., 9 years, May 23rd, 1890, left hip, Emily Slattery	14 months; splint worn 8 months before operation	3 months before operation an abscess began to form round the joint	Anterior incision. Abscess flushed with hot water; diseased head removed; diseased acetabulum gouged and flushed: no drain tube. Iodoform emulsion. Complete closure of wound	Good, no complications. 1st dressing on 12th day. Perfect union by first intention	Patient on D. Thomas's splint for 6 months. Patient shown at meeting well, with hip sound. Cannot be traced.
9	F., 4 years, July 4th, 1890, left hip, Ellen Tree	12 months; splint worn about 4 months	Some months before operation abscess began to form over the front of the joint	Anterior incision. Abscess opened and flushed. Diseased head removed; sequestrum loose, removed; acetabulum diseased, gouged out and flushed: no drain tube. D. Thomas's splint	Stitches removed 11th day; union by first intention. Left U. C. H. August 2nd; wound soundly healed	Wore Thomas's splint for 6 months. Patient shown at meeting. Seen April, 1891, fat and strong, beginning to walk, leg quite straight. Splint only worn at night.

Last column corrected down to date, June, 1891.