ON
EXCISION OF THE LARGER JOINTS;
WITH A TABLE OF CASES.

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THE success of the operation of excision of the knee, introduced by Sir Wm. Fergusson in 1850, naturally led to a reconsideration of the subject of resection as applied to other joints. Up to that time cases of disease of the hip involving destruction of the cartilages were treated with counter-irritation and rest, in the hope that ankylosis would in time take place. When this did not occur the surgeon had no other resource, and the history of the cases was but too often recorded in the specimens with which our museums abound. Under certain exceptional circumstances, indeed, surgical operation was had recourse to, but this could not be said to form any part of the recognised mode of treating disease of the hip-joint. The great authority upon diseases of the joints, at the period to which I allude, says, "In an old case of diseased hip-joint the head of the femur may sometimes be felt lying on the dorsum of the ilium, and, in consequence of the general emaciation of the patient and the wasting of the muscles, with so little soft parts over it that it seems to be almost immediately beneath the common integuments.

In such a case it has been proposed to make an incision on it and remove the head and neck of the femur by a saw. It would appear that this operation has been actually performed with some degree of advantage, and I do not doubt that circumstances may occur to make it worth while to have recourse to it. But it is to be observed, at the same time, that all that can be thus accomplished is the removal of one portion of the disease, and that it is the largest portion of it, in the bone of the pelvis, which is necessarily allowed to remain. The operation cannot be performed without a certain degree of local disturbance, and more or less of loss of blood; and taking all those things into consideration, I conceive that we should not recommend it except where some very unequivocal advantage may be expected from it.”¹

Now, it is evident from this passage that very few surgeons, previous to the period I have mentioned, thought of excision as a means of treating disease of the hip-joint, and that still fewer ever practised it. The instances that occurred in which ankylosis could not take place, as was generally the case when the disease involved a portion of dead bone, were, as a rule, confined to bed for the remainder of their days.

In similar cases of disease of the knee-joint the surgeon had a resource in amputation—a severe measure, involving the loss of the leg and knee, and not unattended with danger—a measure so severe that it was often delayed until the constitution of the patient was irretrievably damaged.

It became, then, a question of the highest surgical interest to know whether the excision of a joint is, as a rule, more or less dangerous than amputation, and whether the limb that was left after such an operation is more adapted to the patient’s wants than some mechanical contrivance would be.

The principal object of this paper is to add the cases which have fallen under my own care to those which have been recorded by other surgeons, in the hope that they may tend to the solution of these most interesting questions, and may be the means of pointing out the conditions under which resection is preferable to amputation.

¹ Sir B. Brodie’s works, p. 210.

With regard to the cases of disease of the knee-joint, it must be premised that in no case was resection of the joint proposed where it was thought that there was any chance of preserving a limb which would ever be of use to the patient. It is true that on some occasions there is less objection to resection on the part of the patients, or their relatives, than to amputation, and therefore the former operation may sometimes be done at an earlier period than the latter. This, no doubt, may be a circumstance which tells in statistical tables in favour of excision, but it is one of the advantages incident to the mode of treatment; any numerical comparison with regard to the treatment of diseased joints by excision should therefore be drawn between excision and amputation, and not between excision and any other mode of treatment.

TABLE I.—*Three cases of excision of the head of the femur.*

No.	Name.	Age.	Date of Operation.	Observations.
1	Henry Cresswell	14	July 6, 1865	Left the hospital at expiration of seventy days. The pelvis was somewhat twisted. Limb two inches shorter than the other; still slight discharge from wound. Has not been heard of since.
2	Edward Disney	8	Jan. 18, 1866	Discharged from hospital July 4th, 1866. The head of the bone and the great trochanter were both much diseased in this case. The neck of the femur contained a portion of dead bone. The portions of bone removed were placed in maceration, but crumbled away in great measure in the process. The head of the bone is, however, partially preserved. This patient recovered with a perfectly useful and movable joint. In the summer of 1868 he walked from Whitechapel to London Bridge, and from Hungerford Market to St. George's Hospital, to show himself, and seemed to think nothing of having to walk the same distances home again.
3	Eliza Castle	14	June 6, 1867	In this case the acetabulum was diseased as well as the head of the femur. Portions of the carious acetabulum were removed at the time of the operation. The head of the femur was carious, and the cartilage that remained was almost entirely detached from it. The neck of the femur contained a small portion of necrosed and separated bone. On the 29th of July a small piece of bone came away, and on the 6th of November she was sent to Margate; some other very small pieces of bone came away during the summer of 1868. In August of the same year a very small sinus was left. She experienced no pain or inconvenience, but could not bear her whole weight on the limb. The limb was two inches shorter than the other, but the heel of the affected side came fairly to the ground, the difference of length between the two legs being compensated by a twist in the pelvis.

TABLE II.—*Twelve cases of excision of the knee.*

4	Harriet Audrie	7	June 30, 1860	This patient was in St. George's, Ormond Street, and King's College Hospitals. There was some necrosed bone in the head of the tibia. In October the wound made by the operation was nearly healed, and on the 3rd of November she was discharged from the hospital. The last note of the case says, "The leg was of good length compared with the other."
5	Benjamin Bennet	8	April 23, 1863	An abscess was found in the internal condyle of the femur. Left the hospital July 1st, 1863. The wound was then quite healed, and the bones ankylosed. He came to the hospital to show himself on the 22nd December, 1863. He could then walk and run with facility. The leg was about an inch shorter than the opposite one.
6	Patrick Rhyle	24	Nov. 24, 1864	Abscess and necrosed bone in head of tibia. Left the hospital March 1st, 1865. Could walk with crutches; a severe attack of rheumatism delayed his recovery.
7	Charles New	11	Dec. 14, 1865	Operation for strumous disease. Discharged May 22nd, 1866. Firm union; limb nearly two inches shorter than the other.
8	Henry Newton	13	Jan. 18, 1866	Periostitis of lower end of femur, causing great swelling; abscess in joint. Discharged July 11th, 1866.
9	Richard Pratt	15	Aug. 30, 1866	Old abscesses; dislocation and ankylosis of knee; wound affected with phagedæna October 1st. Discharged March 11th, 1867. Wound almost healed; got about well with the assistance of crutches.
10	Edward Kemmins	7	March 14, 1867	Strumous abscess in knee-joint. Immediate relief of pain by operation; no constitutional disturbance and very little local action followed operation. Sent to Margate May 16th. Readmitted with very movable joint in 1868, when the soft fibrous tissues between the ends of the bone were removed by operation without producing any constitutional disturbance.

No.	Name.	Age.	Date of Operation.	Observations.
11	William Chapman	21	April 4, 1867	Strumous disease of knee. Died April 24th. The extremities of the bones were found softened. The cancellous structure of the femur in a state of diffuse osteo-myeletis. The femoral vein contained some broken-down coagula, but the lining membrane was quite smooth. There were incipient secondary deposits in the right lung. The liver was fatty, the spleen pulpy, and the kidneys congested.
12	Luther Watson	4	May 15, 1867	Abscess in lower extremity of femur, communicating with knee-joint. Discharged October 19th.
13	Anthony Bachelor	9	June 6, 1867	Strumous disease. Discharged October 2nd, 1867. Wound healed; union firm; limb $1\frac{1}{4}$ inch shorter than the opposite one.
14	Stephen Ring	12	Dec. 14, 1867	Strumous disease; abscess of femur opening into knee-joint. The knee had been bent at an acute angle since he was two years of age. A letter from the boy's father mentions that at that time Professor Syme said, "it would be far better to have it taken off." The limb had never been developed. Some years ago he had an accident and broke the femur, which was allowed to unite with the ends overlapping, and at an angle. The wound made in the excision healed in great part by first intention. He was discharged January 17th, 1868. A small sequestrum of bone was removed from the anterior edge of the tibia in June, 1868. Both before and after this he could walk firmly and without assistance by means of a peg attached to the bottom of a lace-boot. Shortening from the various causes mentioned, $5\frac{1}{2}$ inches.
15	Caroline Blakely	5	Aug. 27, 1868	Contracted and partial dislocation of the knee. Strumous disease of ends of bone; ulceration of cartilages. Died September 12th. Purulent infiltration of the remains of the epiphyses and also of the shafts of the tibia and femur; old scrofulous deposit in lung; minute tubercular deposits in the fissure of Sylvius on each side at the base of the brain.

TABLE III.—*One case of excision of the shoulder.*

16	Wm. Frampton	26	July 26, 1866	Extensive caries of head of humerus, with abscess in joint, and sinuses leading externally. Discharged October 11th, 1866. Had considerable motion of joint; a sinus still discharged.
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TABLE IV.—*Four cases of excision of the elbow.*

17	Kate Wood	15	Aug. 27, 1863	Strumous disease. The extremities of the humerus, radius and ulna, were removed; some small pieces of bone subsequently exfoliated; regained excellent use of her arm; when her sleeve was down a stranger would not know that anything had been done. Last seen with very perfect use of her arm in June, 1868.
18	Thomas Offer	13	Sep. 20, 1864	Primary excision; accident caused by the bursting of a gun; very favorable recovery; free flexion and extension November 9th, 1864.
19	Walter Walder	36	Aug. 17, 1864	Abscess in joint following injury; the wound was healed November 30th, when he was discharged; could flex and extend the limb; a sinus subsequently formed, through which some exposed bone could be felt.
20	* Emily Duffin	20	June 7, 1866	Abscess in joint; ankylosed in nearly a straight position; made apparently a good recovery, but subsequently attacked with most severe and long-continued pain in the humerus. After a long delay, and when it appeared that she was becoming exhausted, the arm was, with much reluctance, amputated; very perfect fibrous union had taken place in the joint. A small piece of detached separated dead bone was found in the ulna, and a considerable quantity of new bone was found deposited on the surface of both the ulna and humerus.

TABLE V.—*Two cases of excision of the wrist.*

No.	Name.	Age.	Date of Operation.	Observations.
21	John Dare	23	March 5, 1860	Discharged June 20th, 1860. The tendons about the back of the wrist were so involved in the general thickening that it was thought impossible that their motion could be restored. The bones were therefore removed by a transverse incision; some power of extending the fingers, however, remained after the operation. This probably depended upon the interossei and lumbricales.
22	Eliza Messenger	44	July 30, 1868	Left the hospital August 13th on account of some family business. In this case the bones of the carpus and some of the bones of the metacarpus were necrosed. The necrosed bones only were removed. No hopes were entertained of regaining the power of moving the fingers, but the patient preferred this operation to amputation. No constitutional symptoms followed the operation.

This table does not include two cases in which an operation was commenced as if for resection, and completed by immediate amputation. The bones in these two cases were known to be extensively diseased, and the operation was undertaken with the understanding that, if the disease extended beyond the limits which would justify resection, amputation should be performed. One of these was a case of old disease of the hip, with an abscess in the joint extending through the acetabulum half way to the umbilicus. The other was an instance of abscess in the knee-joint in which the tibia proved to be extensively involved. Both these cases recovered in a very satisfactory manner.

In two of the above cases mentioned under Section I (Excision of the Head of the Femur) the head of the bone was dislocated from the acetabulum. In the third case, and also in that in which amputation was performed, the head of the bone was in its natural position. In none of the cases was there any inconvenient amount of hæmorrhage. In the third case distinct crepitus could be felt on moving the joint before the patient experienced any great amount of pain. Previous to the operation, however, the pain became exceedingly severe. This led to the idea, after it was found that the cartilage was in a great measure detached from the head of the femur, that the pain had resulted, not from simple ulceration of the cartilage, which must have occurred before the crepitus would have been felt, but from the slight attachment of the cartilage to the layer of bone beneath. When the cartilage is thus in great measure detached it may easily be conceived how a very slight motion would tend to detach it farther and how much pain this would occasion. This case is the first, as far as I know, in which resection of the head of the femur has been performed where there has been no abscess in the joint and no external opening. The immediate cessation of the suffering of the patient appeared amply to justify the operation, and the existence of a portion of dead bone in the neck of the femur showed that she could not have recovered by any other means. The subsequent history of the case proves that excision of the head of

the thigh bone may afford the opportunity for necrosed portions of a diseased acetabulum to escape, which otherwise would remain permanently locked up, so that, although the whole of the disease as regards the acetabulum may not be removed at the time, the patient has a better chance of recovery even with regard to this part of the disease than without an operation.

In performing the operation of resection of the head of the thigh bone, when that is not dislocated, it is not sufficient to divide the capsular ligament in a circular direction. If this only is done, as may be proved by operating upon the dead subject, there may be considerable difficulty in getting the head of the bone out of its socket. The plan which I have adopted is first to make a longitudinal incision parallel to the neck of the femur and extending through its whole length. The knife may then be introduced between the neck of the bone and the capsule. This may easily be divided in front and behind the bone, so as to leave in it a crucial incision, and the head of the bone may then easily be dislocated.

The operation of excision of the knee-joint differs from similar operations on other joints, inasmuch as it may in young subjects be performed without injury to the shafts of the bones. The excisions may be carried through the epiphyses, and then round bones, and not long bones, physiologically speaking, are alone involved in the operation. This is a point to which I am inclined to attach considerable importance. In the great majority of cases of ordinary amputations and fractures that have fallen under my care, and which have terminated unfavorably, there has been inflammation of the cancellous structure of the bone terminating in purulent absorption, erysipelas, or some analogous disease. It must be obvious that if the cancellous structure of the long bones of a limb are uninjured in an operation, the chances of any such diseases occurring are very much diminished. An opportunity was offered me some time ago of seeing some of the preparations of Mr. Jones, of Jersey. I was struck with the small amount of bone removed in some of his cases of excision of the knee-joint, and I cannot help associating in

some degree the success which attended his operations with this circumstance. In several of the cases included in the table the cancellous structure of the bone had been consolidated by chronic inflammation, produced either by the presence of portions of dead bone or by chronic abscesses in the extremities of the bones. This consolidation of the cancellous structure is another safeguard against purulent infiltration of the tissues of the bone, and to the two causes now mentioned I am inclined to attribute the large proportion of recoveries in the cases which have fallen under my care.

To Sir Wm. Fergusson is undoubtedly due the sole credit of having suggested resection of the knee-joint as a mode of treatment, for although it had been performed many years ago, it had never until his day been proposed as an ordinary plan of treating diseases of the knee for which an operation was the only remedy. Having been connected with King's College Hospital at the time that Sir William Fergusson performed his first operation, I know well the amount of opposition which the plan of treatment encountered, and how little the majority of surgeons expected that it would succeed.

One case of excision of the elbow (No. 20) was followed after some lapse of time by amputation of the arm; very perfect fibrous ankylosis had, however, taken place, and the amputation was performed for an affection of the shaft of the bone of the arm, and not for any disease in the joint. In another case (No. 17) of excision of the elbow a crude tubercle was found in the extremity of the humerus. This disease was described by Sir Benjamin Brodie, who has left some very beautiful drawings in illustration of it. It has, however, very seldom been mentioned by other surgeons as having been seen in post-mortem examinations.

The records of the Medical Society of Observation, instituted some years ago for the purpose of making a return of the results of different operations in the various London hospitals, furnish a list of 186 amputations from all causes. Of these, 69 died. Out of this number there were 10 in which amputation was performed for chronic disease of the

knee in patients of sixteen years of age and under. Of these, one died at the end of thirty days, the other on the eleventh day. The numbers given here are not large, but may, perhaps, be taken as the average mortality after amputations in London hospitals, and with these the results of resection of joints in the foregoing table may be favorably compared. Out of 22 cases of excision of the larger joints, 2 only terminated fatally.