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ON DISEASED CONDITIONS OF THE KNEE-JOINT.

BY

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SECTION III.—OPERATIVE INTERFERENCE.

(Continued.)

The Constitutional Conditions admitting Excision of the Knee.

THE condition of the patient after excision of the knee is such that great demands are made upon his reparative powers, and upon his ability to resist the severe suppuration that frequently follows. It really seems so reasonable, that it should be a *sine qua non* for the patient to be free from any other exhaustive visceral disease, that one is surprised to find surgeons advocating the practice of excision when visceral disease is present. There can be no doubt that, if we could agree upon this one point, to give up the satisfaction of excising a knee-joint when the joint-disease is complicated with other serious constitutional lesions, we should materially reduce the mortality following the operation. It should be a golden rule—one of the few without exceptions—that *tubercle of the lung contraindicates excision of the knee*. The extraordinary case quoted by Price, in his appendix, is just a solitary one, where the immediate success of the operation may perhaps lead us to hope for similar results in phthisical patients; but, on reading over the case, I am inclined to think that it was a condition of very incipient tubercle in the lung. By good luck, and good management too, the case made a rapid recovery; but, if any mischance had happened, I can have no doubt that the lung-mischief would have been increased, and the patient would have fallen a victim (as another case is reported to have done) to acute phthisis.

In cases of rheumatic disease of the joint, great care should be taken to ascertain the condition of the heart; and it should also be borne in mind that an atheromatous condition of the arteries sometimes exists, which, if present, would be a grave objection to excision of the joint. The urine should be tested, and if Bright's disease be present, it will materially interfere with the after progress of the case.

There can be no doubt that, as a rule, recovery from excision is a much longer process than recovery from amputation of the thigh. Of course, there are rapid cases of complete recovery from excision; as, for instance, one which I well remember, under the care of Sir W. Fergusson at King's College Hospital, where the man walked into the theatre six weeks after the operation; but this is quite exceptional.

When, then, the constitution is enfeebled by other disease than that in the joint, I think that the procedure which holds out the best chance of rapid recovery should be adopted. If, for instance, a strumous joint have reached that stage of disease in which it is a constant source of trouble and annoyance, and if it seem to increase, as no doubt it frequently does, the irritation of tubercle in the lung, it should be removed; but rather by amputation of the limb than by excision of the joint.

The age of the patient is a point of great importance. Hodges states that excision of the knee has been performed as early as three years and as late as sixty-eight. The former case recovered, but with what condition of after-limb is not stated; the latter died, as one would naturally have expected. The average age of the patients who died after the operation, according to Hodges' curiously minute calculation (Hodges on *Excision of Joints*, p. 150), was $25\frac{2}{3}$ years, and of those who recovered $19\frac{1}{2}$. There can be no doubt that the more fully developed the limb is, the more favourable is it for excision of the knee. The removal of the epiphyses, and the consequent loss of growth in the limb, have been fully discussed elsewhere; and there can be no doubt that, if a portion of the epiphysis can be saved, a very great advantage is gained. I believe, however, that this can rarely be done, and we must, therefore, calculate upon almost entire arrest of growth after the operation. Now, I think that this point has been made too much of; and, although I am adverse to excision in very young cases, because in after years the limb assumes most absurd and useless proportions, yet, even supposing at an early age that the entire epiphyses are removed and growth checked, surely the shortening of the limb a few inches more is no argument against excision of a diseased joint rather than amputation of the limb. The case has been so well put and fairly argued out by Professor Fergusson, in his lecture on Excision of the Knee, that little remains to be said on the matter. If the shortening after a case of excision amounts to, say, three inches, we are not disposed to quarrel with the result, and a high-heeled shoe well supplies the deficiency. Surely a mechanical appliance, twice this length, or even two-thirds longer, is vastly superior and more manageable than a wooden leg of three or four times the length. And it is also worth considering that, as this operation is one more frequently performed on persons of the poorer class, it becomes a matter of importance that the apparatus they are condemned to wear for life should be as simple and cheap as possible. I have known cases where, after amputation of the thigh, the patients have never been able to obtain a wooden leg on which they could walk; principally because they were unable to afford a good one. Now, it is within the reach of every one to obtain a high heeled shoe, or a shoe with an iron peg fastened to it, with which the patient can walk with the utmost facility.

The shortening of the limb is in many cases very considerable. In the case of Mr. Pemberton, so often quoted, he removed three inches and a quarter of bone; but, at the end of six years, the limb was nine inches shorter than its fellow.

In a case of excision of the knee performed by Mr. C. Heath on June 29th, 1858, on a boy aged $11\frac{1}{2}$, the whole joint, including the epiphyses, was removed; and the following measurements were taken in June

1860, two years after the operation. (*Lancet*, July 7th, 1860.)

Height, 4 feet 6 inches.

Right Side.

From anterior superior spine of ilium to lower border of patella	13 inches
From thence to inner malleolus	10½ "
Total.....	23½ "

Left Side.

From anterior superior spine of ilium to lower end of femur	11 "
From thence to inner malleolus	10 "
Total.....	21 "

Showing a difference of exactly 2½ inches.

I was able to obtain the measurements of this case on Dec. 11th, 1865.

Height, 4 feet 9½ inches.

Right Side.

From anterior superior spine to patella ...	16½ inches
From thence to inner malleolus	12½ "
Total.....	29½ "

Left Side.

From anterior superior spine to lower end of femur	12½ "
From thence to inner malleolus	12½ "
Total.....	24½ "

Showing a difference of 4½ inches.

Thus, in a case where the entire epiphyses were removed, the loss of growth has been only two inches in five years and a half.

This case also illustrates the fact, that the tibia, having lost its upper epiphysis, yet grows more longitudinally than the femur which has lost its lower epiphysis. Here the femur, as compared with its

Fig. 18.

fellow, has lost four inches; whilst the tibia, compared with its fellow, has only lost half an inch.

The cause of this has been fully explained, in a former portion of this essay, when treating of the growth of the bones after excision of the knee. I

append woodcuts of this case, showing the condition of the limb two years after the operation and at the present time. (Figs. 18 and 19.) A cast of the knee, taken at the present time, was sent in with the essay.

Fig. 19.

As a pendant to this case, I may refer to one reported in the *Medical Times and Gazette* of Jan. 5th, 1861, by Mr. Henry Smith, where, on April 28th, 1855, the limb was reported to be exactly two inches and a quarter shorter than its fellow. In January 1861, the shortening amounted to four inches. Thus, in six years, the limb had only lost an inch and three quarters in length. (See also letter of Mr. H. Smith, *Medical Times and Gazette*, Jan. 19th, 1861, p. 79.)

In corroboration, I may refer also to a letter by Mr. A. M. Edwards, quoting a similar case, in *Medical Times and Gazette*, Feb. 16th, 1861.

Results such as these are, I think, sufficiently favourable to encourage the surgeon to excise the joint at an early age. The question in such cases to be decided is, at what period of life is the limb sufficiently developed to provide an useful limb after excision, supposing its growth to be very materially checked? And, in deciding this point, we must bear in mind that the entire limb shares in the after atrophy. I take it that the preservation of the foot is one of the great aims of excision of the knee. Now, if this member be so small and stunted as to serve little purpose in sustaining the weight of the body, it is hardly worth preservation.

There are, of course, many reasons which would influence the surgeon as to his decision; but, as a general rule, I do not think that excision of the knee should be practised on children under the age of ten years. It is generally the case that, where disease requiring excision is present, the limb has already been much checked in its growth. And if excision be performed on a limb already smaller than its fellow, and growth still further arrested, the result must be, in children under the age of ten, a limb of very little service in after life.

Before leaving this portion of my subject, I will refer to a paper written by Mr. Holmes Coote in the *St. Bartholomew's Hospital Reports*, 1865, p. 194.

"I maintain that too great importance is attached to the exclusive influence of the epiphyses upon the growth, and that, in whatever region of the body the operation of resection is performed, the great danger consists primarily in the nerve-shock to the patient, and secondarily in the consequences of extensively opening the cancellous tissue of the bone and in the prolonged period of convalescence. In all cases, or nearly so, the limb is withered; small, and weak; and in many instances it is useless, or nearly so. When performed on the young, growth only adds to the consequent deformity; when performed on the adult, the attendant dangers are immeasurably increased."

This is a very wholesale condemnation of the operation for excision of the knee; and the statements are really very much at variance with the general results of such cases. In referring to the quotation, I must point out the inconsistency of the writer, because I find that on April 18th, 1865, Mr. Holmes Coote excised the knee-joint of a female aged 15, and on Aug. 20th she is reported as being able "to leave her bed. The result is satisfactory." On May 6th, 1865, he also excised the knee-joint of a boy, aged 13, who on August 21st is reported as being "convalescent, and he will soon be able to leave his bed." It appears to me that the author of the paper hardly practises what he preaches; and that, if he holds the opinions expressed above, he should refrain from so barbarous a proceeding as excision of the knee. Seeing, however, that he practises that operation with apparent success, I think he gives it but scant justice in his writings.

With regard to the age after which excision should be performed, I think it should never under any circumstance be undertaken in patients above the age of 45 years. I have here fixed what, in my own judgment, is the utmost limit. I would rather excise a knee-joint in a patient before the age of 40 than after. The powers of reparation in advanced life are not sufficiently strong to give the patient much chance of an useful limb, or to support him through the long after treatment.

In concluding my notice of the treatment of diseases of the knee-joint by excision, I would remark that, if the immediate effects of the operation be not as satisfactory as the surgeon could desire, a great deal of patience should be exercised in endeavouring to bring about a successful termination to the case. It is not always, unfortunately, that we can put our patients on their legs at the end of six weeks. Very many circumstances may combine to retard the ultimate cure. In young patients especially, the presence of caries in the heads of the bones often keeps open sinuses, out of which a copious purulent discharge is constantly issuing. In very many such cases, continuous rest, good diet, and change of air, will eventually bring about a perfect cure; but the surgeon may often expedite this by cutting down on the disease, and gouging out the carious bone, leaving a cavity surrounded by healthy tissue, which will soon be filled up by fibrous material, and in no way interfere with the after-results of the operation. This process may in the same case be resorted to more than once, until, as Sir William Fergusson has expressed it, by constant and patient picking at the disease, we eventually remove the entire mass,

and the sinuses heal up. Or, if the surgeon have reason to believe that the ends of the bones are still diseased, he may adopt a yet bolder proceeding, and have recourse to re-excision of the diseased extremities. Thus it is possible to obtain healthy bony surfaces, and ultimately firm union. A case of this nature was lately under the care of Mr. Henry Smith at King's College Hospital. Finding that a number of scrofulous sinuses existed, he cut down, dissected away a large quantity of diseased tissue, and removed a slice from the ends of the bones. The case progressed rapidly towards a cure. In cases where the ankylosis is simply fibrous, and of so slight a nature as to prevent the use of the limb, time and change of air will work wonders; and very frequently, when both patient and surgeon are nearly tired of waiting, osseous union commences, and progresses rapidly. Great care must be taken during this period that no distortion of the limb takes place. A stout leather splint, carefully moulded and laced up in front, is the best preventive; but, even with it, a watchful eye should ever be kept on the limb, and any tendency to displacement immediately corrected by the application of appropriate apparatus.

One of the great arguments against excision of the knee-joint is this fact which we now noticing; viz., the prolonged convalescence of the patient, and the frequent uselessness of the limb after all. I do not think that the first part of this objection is by any means a sound one. In the first place, it is proved that, in some cases, excision of the knee-joint makes as rapid a recovery as amputation of the thigh; and, on the other hand, there are very many cases of prolonged convalescence after amputation of the thigh; and it frequently happens, that a considerable period elapses after the so-called cure of the case before the patient can bear on the stump any apparatus, with which he can walk about. In addition to this, admitting that, in the ordinary run of cases, the time after excision is longer before the patient can walk on the limb, than after amputation before he can bear a wooden leg, yet surely the prolongation of convalescence in the former case is a good investment of time, for it promises a leg of flesh and bone, with a good foot at the end of it, instead of a wooden leg; which, under the very best circumstances, is a life-long encumbrance to the patient. With regard to the second part of the objection, as to the ultimate uselessness of the limb, I fear that many surgeons are too hasty in their condemnation of these after-excision limbs. Thus many are condemned to amputation, because they "hang like flails", before time has been given and every means used to procure osseous deposit in the fibrous tissue connecting the bones. Or, again, surgeons shrink from having recourse to such minor operative procedures as the removal of a small quantity of necrosed bone, whilst they rush headlong to the capital operation of amputation of the thigh.* We

* The report of a specimen exhibited by Mr. Holmes at the Pathological Society of London in 1860 (*Pathological Transactions*, xii.) from the case, to which that gentleman refers in his paper in the *British and Foreign Medico-Chirurgical Review*, affords an excellent example of undue haste to amputate a limb after excision of the knee. The patient was aged 19; his right knee had been diseased six years, and was excised by Mr. Gant on October 31st, 1859. He was admitted into St. George's Hospital in August 1860, "in a state of great emaciation and weakness, with constant pain and discharge from numerous sinuses around the situation of the joint." The thigh was amputated on August 16th, and he recovered. The fol-

have yet to learn, in the treatment of these cases from the very first, some of those lessons of patience inculcated by Mr. Hilton, although I am sure that virtue will seldom be so severely taxed as he would have it to be.

Before proceeding to the consideration of amputation of the limb, I wish to call attention to what may be called a sort of intermediate step between the two operations. It has been very well remarked that, however deep may be our insight into disease, we may sometimes be mistaken as to its extent. Mr. Cadge of Norwich, in a letter to Mr. Price, published in his essay, states that he has frequently opened the joint and examined its condition before deciding to amputate. I think this plan of exploration an admirable one. There are very few cases of knee-joint disease, except where the constitutional condition of the patient demands amputation, where this plan might not be pursued with advantage. I would, however, proceed a step beyond the mere opening of the joint, and saw off the articular ends of the bone as well. There can then be no mistake as to our diagnosis; and it may sometimes happen, that we shall have the extreme satisfaction of saving a limb to the patient, which had previously been condemned to amputation. Certainly we should be saved the remorse (for such *should* be our feelings) of ever having removed a limb that might have been saved by the simple excision of the knee-joint. In the section on amputation will be found a case of this nature, in which I completed the operation by amputation. The condition of the bones shown in preparation No. 5 was a sufficient warrant for this proceeding. I may mention, without trenching on the latter part of my subject, that I consider a modification of Teale's rectangular amputation the best in these cases. The horseshoe incision, made as the first step of the excision, will make the base of a long anterior flap, which may be dissected upwards from the front of the knee and thigh; whilst a short flap may be cut behind quite high enough to secure division of the femur above the seat of disease. Of course, I am presuming that the soft tissues at this part are sound.

Appended is an admirable drawing belonging to late Mr. Price, showing the condition of ankylosis in a case of Mr. Mayo's of Winchester. The man had a most useful limb, but died in hospital of erysipelas. (See case reported in Price's *Essay*, p. 111.)

Another drawing, also belonging to the late Mr. Price, showing a false joint formed after excision of the knee, accompanied the essay.

[To be continued.]

lowing is an extract from the report of the specimen. "At the back part of the surface of the inner tuberosity of the tibia, was a deep carious cavity, in which two or three very small fragments of dead bone had been lodged. A large extent of the upper surface of the tibia around this was rough and exposed. Hardly any union existed between the bones at the back part; but a strip of ligamentous tissue passed obliquely upwards and inwards from one bone to the other. In front, the femur, which was slightly displaced inwards and advanced upon the tibia, was firmly soldered to it by a structure which was in great part bony, mixed with fibrous tissue; here and there, however, rounded nodules were seen in the uniting material, of a bluish colour when fresh, semi-transparent, and showing under the microscope very plainly the characteristic nuclei and intracellular substance of true cartilage, with ossification progressing in several parts... The union was found to be soft, so that a slight amount of flexion was still possible. The ends of both bones, but especially the femur, were much expanded, and the superficial laminae so separated from the subjacent bone, as to crackle under the finger."

Illustrations

OF

HOSPITAL PRACTICE:

METROPOLITAN AND PROVINCIAL.

BOOTLE GENERAL DISPENSARY,
LIVERPOOL.

CASE OF ABSCESS, ETC., IN CONNEXION WITH URETHRAL
STRICTURE.

Reported by M. HILL, L.R.C.P., and L.R.C.S. Edin.,
House-Surgeon.

J. G., aged 44, married, and has a family; nervous temperament and scrofulous taint. I first saw him on the 2nd of February last. His appearance was most distressed and anxious; he was suffering acute pain; he had had severe rigors for two or three days previously, and was in mortal dread of their recurrence. There was an exquisitely tender spot about midway between the pubes and testicle of the left side, but no redness, tumefaction, or fluctuation, perceptible. He could scarcely bear this spot to be touched, so that a slight digital examination was imposed on him. He had no difficulty in passing urine; no tenderness along the course of the urethra, nor had he received any hurt in that neighbourhood. I ascertained that he had gonorrhoea at an early age, which left him, as a *souvenir*, a stricture or two in the bulbous and membranous portions of the urethra. These gave him but little trouble for a long time; however, year by year, they grew more callous and constricted, according as wet, cold, or excesses affected him, yet did not so far interfere with the passage of urine as to require the catheter until about twelve years ago; since when he had had to apply to the dispensaries and hospitals in Liverpool several times. He stated that very often the greatest difficulty was experienced in passing even the smallest sized instrument. He was told on one of these occasions by an experienced member of the profession that false passages had been made into the bladder—a statement I can readily believe. He got on well without the catheter for the last six years, but about eight months before now he was seized with rigors, without any apparent cause, which rigors continued to recur at intervals of from two to four weeks, until near Christmas, from which time to within a few days he had enjoyed an immunity from these shakes. I was in doubt. Was it a lumbar abscess pointing in this situation? or a collection of matter in connexion with stricture? The first hypothesis depended on the long standing rigors—eight months—his previous ill condition, the fact that heretofore he had large indolent abscesses near the shoulder, presumably of a scrofulous nature, and the absence of any uneasiness or pain which a lesion of the urethra would or ought to occasion in that tract, and the latter supposition had for grounds the present acute symptoms, inflammatory disturbance, and the presence of an old stricture, albeit he had at this time neither extravasation of urine, nor more than the usual difficulty of passing it. I was tempted to put in a grooved needle, and find out the position of the pus which I knew was within; but I refrained on account of the great pain it would occasion, at least, until I had the benefit of others' experience. I therefore ordered him a smart aperient, hot anodyne stupes, and an opiate to secure sleep, from the want of which he suffered greatly. Two leeches were applied next day, but with no remission of the pain or rigors. I had Mr. Sprakeling, one of the honorary