THE

Jacksonian Prize Essay

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ON DISEASED CONDITIONS OF THE
KNEE-JOINT.

BY

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SECTION III.—OPERATIVE INTERFERENCE.

(Continued.)

Cases where the Bones are Primarily Diseased, or where they have become Extensively Involved as a Secondary Result. In considering the question of excision as applied to cases of diseased cartilage, we have of necessity also considered that extension of the disease which involves simply the articular surfaces of the bones. The application, however, of excision to cases where the bones are primarily involved, or where there exists a considerable amount of disease in their structure, is a question upon which there is a very wide divergence of opinions.

Much of the success of excision of the knee, when undertaken in cases where the bones are involved, depends upon the ability of the surgeon to determine as to the condition of the cut surfaces of the bones after the articular surfaces have been removed. If the diseased conditions be restricted to the immediate neighbourhood of the joint, or if, although extending somewhat more deeply into the spongy portion of the bone, the disease be yet circumscribed; then, if the constitution admits, there is no more reason why excision of the joint should not be performed, than there was in those cases of disease of cartilage which we have just been considering.

Allusion has already been made to the condensation of the bone which takes place in the earlier stages of inflammation, and which was well illustrated by Preparation 2 sent in with the essay, where, in fact, simple hyperæmia is just merging into inflammation. On sawing through a bone thus affected, we find the cavities of the cancelli diminished and their walls thickened, and the whole surface presents a reddish pink hue from the colour of the serum exuded. This condition of the bones, whilst it demonstrates the fact that serious mischief has not extended deeply, is also a warrant to the surgeon to proceed with the excision, and gives the greatest hope of a successful termination of a case. It is not often the good fortune of the surgeon to meet with a case thus uncomplicated. It is more usual to find this condition alternating, as it were, with other and less favourable states of bone. Thus, we may find spots of ulceration, named by Barwell "caries circumscripta", or pieces of necrosed bone, "caries necrotica," surrounded by indurated tissue. The surgeon will have to decide in such a case, whether the amount of indurated tissue surrounding these diseased conditions is sufficient to warrant perseverance in the excision. The softened and necrosed portions, if not in excess, may easily be removed with the gouge, and thus a surface obtained well

calculated to ensure after success. It is a question to be decided at the time, to how great an extent gouging should be carried. I have certainly seen admirable results after the very free use of the gouge; but it is a fact that abscess of the bone occasionally follows, causing severe suffering to the patient, and ultimate destruction of the parts involved.

I cannot go the entire length that the late Mr. Price has, in stating that, if

"One of the condyles and a mere shell of the tibia remain after the articular surface and synovial membrane have been removed, sufficient consolidation will admit the recovery of a useful though considerably modified limb." (Price, *On the Knee-Joint*, p. 136.)

He quotes a case of his own, which turned out well; but certainly, in the generality of cases, such an advanced state of disease would be better treated by amputation, than to run the risk of entire failure in the results of the excision, or at best recovery with a "considerably modified limb." Circumscribed collections of matters are sometimes found in the spongy textures of the bones, which, if of moderate size, need not impede the operation. A case of excision of the knee performed by Mr. Wood at King's College Hospital (see Appendix) well illustrates this. In the accompanying preparations of the ends of the bone, an abscess is shown in the head of the tibia. This case also shows an example of the extension of disease from the end of one bone through the intervening joint structures to the end of the other bone.

Another diseased deposit in the ends of the bones we have already discussed—viz., "the tuberculous matter" insisted on by Price. I have stated elsewhere my reasons for not thinking this deposit to be analogous to tubercle of the lung. Its actual nature has, however, little bearing on the question of excision. The diffuse variety of this disease is entirely unfitted for the operation of excision. The earthy constituents of the bone are very much diminished, and there is little or no chance of repair after the operation. In addition to this, as Barwell justly remarks—

"A diffuse inflammation, wherever it be situated, and whatever be its products, always marks so low a constitutional state, that we should give the system as little reparative labour as possible." (Barwell, *On Diseases of the Joints*, p. 423.)

In the circumscribed variety, there is no reason why the same treatment should not be applied as in cases of circumscribed caries or necrosis. In fact, I am inclined to think that better results may sometimes be expected; for it is often found that the surrounding bone is more healthy and capable of repair than when a carious or necrotic condition is present.

If, upon making the section of the bone, large diffused extravasations of blood be present, or if it present a dirty yellow appearance from diffuse supuration, the operation of excision is not admissible.

Excision of the Joint for Traumatic Injury is a matter for very careful consideration. I do not think it has obtained that amount of attention from writers on the subject of excision of the knee which it deserves. This, perhaps, arises from the fact, that our opportunities in civil practice of performing the operation for injury to the joint are few and far between. We have, however, staring us in the face

the fact that the mortality following amputation of the thigh in the lower third after traumatic injury is in military practice 56.6 per cent. (Macleod's *Surgery of the Crimean War*); whilst in civil practice it is 60 per cent. for primary amputations and 75 per cent. for secondary amputations. (Bryant.) It is hardly possible to imagine that any proceeding can show much worse results than these; and I cannot help thinking that there are very many cases of extensive wounds of the knee-joint which have hitherto been treated by amputation, which might have a better chance of recovery if the articulation were removed by excision. I do not wish at the present moment to enter into any comparison between the two operations of excision and amputation; but I simply now make this statement, which I hope hereafter to substantiate, *that the shock after excision is less than that after amputation*. Now, severe injury to a large joint like the knee is a source of severe shock to the patient; and it appears to me that, as a primary proceeding, the operation which adds the least to the existing shock is the one that gives the best chance of immediate rally to the patient. I can see no difference between the after conditions of an excision thus performed and one undertaken for a diseased articulation, except that in the former case we have in all probability a robust constitution to back up the operation, whilst in the latter the ravages of long standing disease detract very much from the reparative powers of the patient. I believe that there are many cases of severe lacerated wounds of the joint happening to young robust subjects, now treated by immediate amputation, which would do very well, and have a better chance of recovery, if excision were practised. We cannot, of course, draw any very strong inferences from a single case; but I append the history of a case in which Mr. Kempe of Exeter acted on this principle, and had the extreme satisfaction of saving both the limb and the life of his patient.

"June 10, 1862, John Fewings, Exwick, aged 13, was admitted under the care of Mr. Kempe, with a lacerated wound of the right knee freely communicating with the joint, the result of an accident. Excision of the joint was performed about one hour after the receipt of the injury. Great constitutional disturbance and some delirium followed the operation, which were subdued by opium, etc. A large abscess formed on the right hip, apparently arising from some extravasated blood which took place at the time of the accident.

"He was made an out-patient in September, with a very firm union of the bones, but with one or two small sinuses.

"I saw this young man, about twelve months after his discharge, loading a railway-van, apparently with as little inconvenience as if he had suffered no loss of the joint."

In cases of gunshot wounds, where severe damage is done to the osseous structure, I think, from the slender information we have, that the proceeding is of very doubtful utility. Hodges has collected the history of twelve cases; and of them only three recovered, and one of these only at the end of twenty months, during which time dead bone was constantly exfoliating.

The two cases of excision performed by Mr. Canton of the Charing Cross Hospital, although not primary operations for injury to the joint, were yet

undertaken for a condition which was the immediate result of an accident; viz., the forcible separation of the lower epiphysis from the shaft of the femur. In both cases, an attempt was made to procure union; but it failed, and inflammation attacked the joint. In the first case, the patient made a good recovery, with a useful limb; and, by the kindness of Mr. Canton, I am enabled to give illustrations both of the parts excised and of the subsequent condition of the limb twelve months afterwards. (Figs. 14, 15.)

Fig. 14.

In the second case, the patient was exceedingly restless, and an inch of the femur protruded and had to be removed with the saw. Fibrous ankylosis resulted; and, as the limb proved useless to the patient, Mr. Canton amputated the thigh, and the patient did well. (*Dublin Quarterly Journal of Medical Science*, February 1861.)

I am permitted to send in an unpublished drawing belonging to the late Mr. Price, which shows, in a very beautiful manner, the excised portions of the bone in this latter case, and the after condition of the joint.

Deformity of the Limb resulting from old Disease in the Joint is the last condition requiring excision which we have to consider. I believe this proceeding to be open to very grave objections. I am perfectly aware that the results have in many cases been most brilliant. Many surgeons have performed the operation, and restored to their patients useful limbs; but there is to my mind this grave drawback to its general adoption; viz., that the life of the patient is endangered without the actual necessity having arisen for its being so. It is every one's experience with what facility the unfortunate possessors of the most deformed knee-joints move about with the help of some simple apparatus. Is it right, under these circumstances, to subject the patient to the extreme danger of a capital operation? And, even supposing the patient recover with a fair limb, is he so very much better off than he was before? To both questions, I am bound to give a negative answer.

With regard to the after condition of the limb, it

must be remembered, that old and long-standing disease has rendered the leg and foot stunted and ill developed. And, supposing the most favourable result, there must of necessity be considerable

of Mr. Swain, with disease of the knee-joint, on June 16th, 1864.

History. Five years ago, while playing on the ice, he fell, and injured his knee. Apparently he recovered from this; but a fortnight afterwards, during a walk, he was seized with pain and inability to move the limb. He was treated for a sprain, but received no benefit. Two months afterwards, he was an out-patient under Mr. Swain at the Dispensary. At that period, the knee was as swollen and contracted as at the present time. He left off attending at the Dispensary about four years ago. He had had no medical treatment since. Abscesses formed in the joint about eighteen months before his admission, and discharged for nine months; since which period the sinuses healed. His father and mother are living. He had been a very healthy boy, and not subject to a cough.

On admission, he was a healthy looking boy, but of rather strumous aspect. The glands in the neck were slightly enlarged. He was in good condition; pulse 80, of fair strength, regular; skin and bowels acting well; no cough. The left leg and thigh were much wasted. The leg was flexed to its utmost extent upon the thigh; the hamstring tendons were contracted and tense. In the lower third of the thigh were the cicatrices of five sinuses—four on the outer, and one on the inner side of the limb. The left knee-joint was greatly increased in size, and of an oval form. The internal condyle of the femur was

Fig. 15.

shortening of the limb, requiring very likely an apparatus even more cumbersome than the one before in use. Hodges gives an account of nineteen cases of excision for deformity, eight of which terminated fatally, from circumstances directly connected with the operation, and one came to amputation, osseous union being long delayed.

At the earnest desire of patients or their friends, I think the surgeon may be justified in undertaking this operation; but I cannot think that he is justified either in suggesting the proceeding or pressing it on the patient. I excised a knee-joint for deformity, partly at the earnest desire of the boy's mother, and partly (I was more influenced by this latter consideration) because I found that, although the disease was quiescent, every now and again the boy fell on his knee and set up active inflammation in the joint. The case made a satisfactory recovery; but there is considerable shortening of the limb, carious bone in the head of the tibia, and at present only fibrous ankylosis, although that is pretty firm. I have once removed some carious bone from the head of the tibia, after which the condition of the limb much improved, and I have great hopes that in time he will have a useful limb. The ends of the bone are sent in, together with photographs of the case before the operation and at the present time. The following is the history of the case.

CASE. Henry Hearle was admitted under the care

Fig. 16.

considerably enlarged. The external condyle was also enlarged, but to a less extent. The patella was inclined to the outer side, and ankylosed to the external condyle. The head of the tibia did not appear to be enlarged to any appreciable extent. There was little or no pain, except on manipulation of joint. There was a little antero-posterior motion, with rather free lateral movement of the joint, showing destruction of the ligaments.

July 2nd. To-day, the child being put under the influence of chloroform, Mr. Swain proceeded to perform excision of the knee-joint. A semilunar incision was made across the front of the joint, and the flap resulting dissected back from the patella and the end of the femur. The lateral ligaments were divided; the bone was cleared for the saw, and forcibly

flexed. About one inch and a half of the articular surface was sawn off. A slice was then taken off *obliquely* from the tibia, about one inch in thickness. An abscess in the head of the tibia, opening into the joint, was gouged out. The cut surfaces were then approximated; the flap laid down; and the limb put up in a resection splint. There was no hæmorrhage of importance; and no arteries required ligature.

8 P.M. During the afternoon, the child had been very restless and noisy. The effect of the chloroform had not passed off; and the sickness of the stomach prevented morphia draughts from being kept down. When seen, he was easy, and dozed at intervals.

July 3rd. He had a quiet night, sleeping at intervals until the morning. Skin cool; pulse 104, quiet. He suffered but little pain. The knee was not disturbed. He was upon a water pillow, the leg being put up on an excision-splint, and swung in a Salter's swing.

July 4th. He slept well through the whole night. This morning he was quiet, and suffered but slight pain. Pulse 126; skin dry, warm; tongue furred, with enlarged papillæ; bowels open. The knee was dressed this morning; the outside bandages were saturated with blood. The wound appeared healthy; water dressings were ordered. Ten minims of solution of hydrochlorate of morphia were ordered.

July 7th. Last night he was very feverish, and had a rigor. To day he was quieter. Skin cooler; tongue very furred; bowels confined. He took an egg and wine for dinner. When the leg was dressed to day, a large quantity of grumous pus was squeezed out.

July 11th. He was much improved. Skin cool; pulse quiet. He slept well at night without a morphia draught. He had a fair appetite. The leg was in a good position. The flaps were healing by granulations, leaving an open large pouch at the outer corner of the wound for free escape of discharge. The wound looked healthy; and the discharge was very free. The wound was dressed with myrrh lotion.

July 20th. He slept at night without a draught. There was not much discharge from the wound, as a small sinus and opening in the popliteal space effectually drew away the discharge.

Sept. 5th. The excision-splint, having galled him, had been left off, and the leg put up in gutta-percha splints. The leg was two inches and a half shorter than the sound one. Two or three sinuses remained about the knee-joint; and a gall on the inner side of the knee and one on the heel, from the pressure of the splint. He got up, and was dressed; was in good spirits, and took his food well.

Sept. 19th. The patient was up and about on crutches. The wounds on the leg had not yet healed; but they did not inconvenience him, except when dressed. A gutta-percha splint was to day moulded to fit the whole limb.

Oct. 10th. Three wounds on the leg still remained unhealed. There was a sinus leading to the head of the tibia, from which a thick pus, and a few days previously a small bit of dead bone, came. There was firmer union between the bones. A slight tendency of the tibia to bow out was obviated by a straight splint on the outer side of the limb. A straight splint was applied also to the under surface of the thigh and leg. He walked about on crutches.

Oct. 17th. Dead bone could be detected in the tibia; a small spiculum came away to day in the discharge.

Nov. 19th. All the wounds were healed, excepting the sinuses leading to dead bone around the knee-

joint. The leg was in very good position. Union was becoming firmer. The shortening was two inches and three quarters.

Fig. 17.

Dec. 31st. Mr. Swain removed some carious bone from the head of the tibia, leaving a moderately large cavity there.

Jan. 31st, 1865. The cavity was still discharging a quantity of offensive pus. The general health was very fair. He was discharged.

[At the present time this patient is much improved, and is able to walk very well on his high-heeled boots with the aid of a stick.]

[To be continued.]

THE LEEDS INFIRMARY. This handsome building which has just been completed at an expense of £100,000, is about to be appropriated for a short time for an exhibition of treasures of art, products of industry, and processes of manufacture, on a scale not hitherto attempted in the county. To accomplish this end a guarantee fund of £50,000, was solicited, and in less than a fortnight £55,000, was raised. It is expected that the fund will reach £100,000.

THE WEEKLY RETURN OF DEATHS in the metropolis up to Saturday last, shows an improvement of the public health. The mortality from cholera and diarrhoea was about the same—100 as compared with 101. The deaths from the two forms of the epidemic in the last five weeks respectively were 254, 199, 144, 101, 100. The majority of the deaths from cholera have lately occurred in Woolwich, where 73 persons have been cut off in three weeks. The Registrar General describes the peculiar circumstances of Woolwich, and attributes the outbreak to the insufficient water supply, the dirty and dilapidated condition of the houses of the labouring classes, and the unhealthiness of their sites. Cholera retreats but slowly from the large towns it has visited. Last week the deaths were respectively in Dublin, 82; Edinburgh, 36; and Liverpool, 14.