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GUY'S HOSPITAL.

EXCISION OF PORTIONS AND OF THE ENTIRE ELBOW-JOINT,
FOR SCROFULOUS DISEASE OF THAT ARTICULATION:
ILLUSTRATED BY CASES.

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[Read before the Hunterian Society.]

THE value and paramount importance of the forearm and hand to all individuals is so great, whatever may be their station in life or social condition, that the practical surgeon has diligently and laboriously studied how such important members might be saved without incurring risk to life in the undertaking.

In 1836, Mr. Blackburn, an active and very intelligent student at Guy's Hospital, published, in the *Guy's Hospital Reports*, vol. i, pp. 268 and 274, a paper entitled "An Essay on the Excision of Diseased Joints"; and in the same volume there is the relation of a case in which the elbow-joint was excised from a man by the late Mr. Aston Key, in 1835. The success attending this case led to the substitution of this operation in preference to amputation in all practicable cases; and there have been a great many operations of this kind performed by all the surgeons of the institution since that time, and with the most complete success. The "conservative surgery" principle, so much vaunted in the present day, has thus been most fully carried out, although it may not have enjoyed the advantage of the publicity so freely accorded to the doctrine as emanating from other quarters.

The cases I shall directly read are examples of surgical interference with disease of the elbow-joint, originating, in all probability, in the articular extremities of one or more of the bones composing that articulation. The circumstances attending the development of the disease have differed to a certain extent. Thus, in one, the disease seems to have commenced immediately after the receipt of an injury; in another, the joint became affected, without any assignable direct cause; in a third, the disease seems to have been secondary to thoracic mischief; and the fourth patient felt the elbow stiff and painful for a year before he fell and contused the part, thus adding the effects of secondary mischief to primary disease.

In all the patients, the scrofulous diathesis was strongly marked, and none of them could be described as having enjoyed the advantages of perhaps even the necessary requirements for healthy nutrition. One was a delicate child, the member of a large family, whose father was in great difficulties, and who, I learned, sometimes obtained scarcely any food at all; another had been a teacher in a village school; the other two were young men, one a clerk in a London counting-house, and the other a porter, who was the strongest of all.

Two of the patients, the girl and young man, were the subjects of pulmonary complications: the man had suffered severely with pleurisy, accompanied by effusion, some months before the elbow gave him pain; and the girl was probably the subject of tubercular deposition, according to Dr. Hughes, at the time she came under my treatment.

All the patients were very much reduced by their sufferings and the purulent discharge; and this was manifested in a very marked degree, in relation to their constitutional diathesis and

age. The child was the most reduced of all, although the disease had been active only six weeks; and of the adults, a man (Case III) was in a very low condition, the disease having been acute from two to three months. He was a delicately made, small boned, fair skinned individual, whose muscular and thoracic development were prominently deficient.

After these preliminary remarks, I will read the cases.

CASE I. *Injury of the Elbow Joint; Disease of the same Joint—Inflammation, Suppuration, Abscess, Sinuses; Excision of the Olecranon and Part of the Shaft of the Ulna.* N. W., aged 4 years, was admitted into Dorcas Ward on March 31st, 1854. He was called healthy, but was a delicate-looking strumous child. This child resided with his father and mother at Kennington. They had six other children, all healthy. Until eighteen months before admission, this boy enjoyed good health. He was, about that date, playing with other children, when he fell on to his left elbow, it is supposed, for it was swelled and painful. This swelling subsided in a few days, but about a month afterwards the joint enlarged, and he was brought to Guy's as an out-patient. After local applications and general constitutional treatment, the local disease improved. About six weeks before admission, the joint rapidly swelled, and, during the last three weeks, it had been very painful and inflamed.

When admitted, the left elbow-joint was enlarged, and any attempt to move it caused great pain. It was semiflexed, and the forearm pronated, and held in that position by the child's right hand. Any movement of the member gave pain, and the least local pressure was insufferable. Warmth and moisture were applied, and tonics administered.

April 12th. A large abscess was forming, but the constitutional disturbance was not great; and it was allowed to point and open, which it did about the beginning of May. The opening was not very large, and the size of the swelling was not much diminished by the escape of thin serous pus; and I thought that, at the time the opening was enlarged, it would afford a good opportunity for the examination of the bones forming the joint, and for removing any portion which might appear to be diseased.

On May 9th, 1854, the child being under the influence of chloroform, I made a single vertical incision over the posterior aspect of the joint; and, after removing a large quantity of soft flocculent vascular growth, I exposed the olecranon and contiguous portion of the shaft of the ulna, and cut off about an inch and a half of this bone. The articular end of the humerus and head of the radius appearing to be healthy, I left them untouched. The joint itself contained pus; but, from the ends of the bones consisting, at this age, of temporary cartilage, it was difficult to ascertain whether the articular cartilage was destroyed or not. The portion of ulna excised consisted of the olecranon process and about an inch of the shaft of the bone. The last was entirely deprived of periosteum, was soft, and appeared to have constituted the focus of the disease. The epiphysis of the olecranon seemed to be healthy. Very little bleeding attended the operation. Stripes of wet lint were used to support and adjust the edges of the wound; and the arm was placed in a semiflexed position, or at an obtuse angle.

For four days after the operation, the child suffered very acutely, and the constitutional disturbance was very severe; but on the fifth day, when suppuration was freely established, he was much improved. During this time, and even subsequently, the condition of the arm and the child's general health were such as to anticipate the necessity of amputation at no very remote period; but, by giving the child every possible amount and kind of wholesome nutritious food, he at last improved sufficiently to leave the hospital about three months after the operation.

After this time, the child came as an out-patient for some months; but the restoration of his health was attended with most adverse circumstances.

In May 1856, I admitted the child again, when there was still a continued suppuration from sinuses around the elbow, and his constitutional condition was very low. He left the

Hospital in August, much improved, and the sinuses nearly healed.

During the season of 1857 and 1858, he passed the time at the Royal Margate Sea-bathing Infirmary, and there he derived the greatest amount of advantage. All the sinuses healed, and the health was greatly improved. He has now a very useful arm, but there is very little movement at the elbow.

CASE II. *Strumous Disease of the Elbow-joint, of about one year Duration; Excision; subsequent Amputation of the Arm; Recovery.* M. J., aged 20, from near Wells in Norfolk, was admitted on May 2nd, 1855. She had been employed as a teacher in a school, and had enjoyed good health, although of a most strumous diathesis. One year since, her right elbow became stiff and painful, without any assignable cause; and in a few months it inflamed, and her health began to decline. Mr. Hugh Rump of Wells attended her; but, as no favourable change occurred from the treatment, she came by his directions to London, to submit to excision or amputation. When admitted, she could scarcely endure any movement of the forearm; a large collection of pus existed on the outside of the joint; and the hand and forearm were œdematous. Dr. Hughes reported that "mucous rattle and bronchial breathing existed over the upper part of the right scapula, probably dependent upon tubercular deposition." With this opinion, I did not consider that there was much chance of a favourable termination of the case, if I excised the joint; but the girl had made up her mind to have this operation performed; and, although I frankly told her my opinion of the probable result of the case, and that it would be very likely to end in amputation at last, she decided to go through the first.

I did not immediately perform the operation, wishing first to improve her general health; but the joint became more painful, and the abscess broke; and, on May 22nd, I excised the olecranon ulnae, and the inferior extremity of the humerus. The head of the radius, appearing to be healthy, was not excised. A single posterior vertical and one transverse incision from its centre were made, and not the usual incision in the shape of the letter H. Very little hæmorrhage occurred, and the wound was dressed with wet lint. All the cartilage upon the surfaces of the bones was destroyed; their surfaces, as well as the synovial membrane, were covered with the vascular granulations; but the tissue of the bones seemed healthy. She seemed very well the next day; but for several succeeding days she had constant vomiting and diarrhœa, which no medicine seemed to check. During this time, her pulse was scarcely accelerated; her tongue was clean and moist. She could take no nourishment whatever; she slept very little; yet the wound did not assume an unfavourable aspect. By degrees the wound healed, leaving a fistulous opening, from which pus was discharged.

Thinking that a return to fresh air and the country might be useful, she left the hospital July 30th, and returned home. I saw this patient in the country, in August 1855. Her general health was very little improved, and the arm quite useless. There was still a discharge of pus from two openings; and, from the long time which had elapsed since she was able to use her wrist-joint and fingers, they had become stiff and very nearly fixed in the extended position.

She continued in very delicate health throughout the winter, during which period the arm was kept flexed and at rest; but, as little repair took place, in April 1856, Mr. Hugh Rump amputated through the humerus. I examined the parts which had been the subject of the operation. Open sinuses led to the ends of the humerus, ulna, and head of the radius. The ends of the humerus and ulna seemed to be healthy; but the head of the radius was carious, and united to the ulna. Much vascular granulation-tissue surrounded the ends of the bones.

From this operation the patient recovered.

The bones, after maceration, show a considerable growth of spiculae of new bone around their diseased ends; and the texture of the cancellous tissue of all would lead to the inference that a carious state of the bones existed at the time amputation was performed. The radius separated from the ulna by maceration.

CASE III. *Disease of Right Elbow-Joint, subsequent to an Attack of Pleurisy; Suppuration, Sinuses, Excision, Cure, with Movement at the Elbow.* Baker, aged 20, was admitted on Sept. 30th, 1857; he had been a warehouseman, and resided at Lewisham. He was a very delicate-looking man, but stated that he had enjoyed good health, except when confined to his bed, about fifteen months since, with pleurisy. About seven months since, the right elbow felt stiff, the joint became flexed,

and pain and swelling of the joint followed. It was placed upon a splint for some time, and blistered; but the disease advanced; and in August an abscess was opened, which discharged at the time of admission.

When admitted, he was very much reduced in constitutional powers; he was emaciated, hectic, with slight continued cough; was unable to sleep, in consequence of the pain from the local disease; had little or no appetite; and appeared to be sinking gradually. On an examination of the lungs by the physicians, they were believed to be in a sound condition, although traces of the pleuritic attack remained. The disorganisation of the elbow-joint appeared to be complete, although I could not detect very distinct crepitus, from attrition of the articular ends of the bones, in all probability deprived of most of the articular cartilage.

The arm was carefully bandaged from the fingers to the elbow; stripes of wet lint were applied around the elbow; and the member supported upon a splint, the joint being flexed at the angle which afforded the greatest amount of ease to the patient. Nutritious but light and not stimulating diet was taken. Cod-liver oil was administered, and a narcotic at night. Under this treatment, his constitutional condition materially improved; and, after a residence of twenty days in the Hospital, he seemed to have made so much progress that I considered it right to submit him to excision of the joint, in preference to amputation through the humerus.

This operation was performed October 20th, 1857. A single long incision was made over the posterior surface of the joint, and the ends of the bones excised. The destruction of the articular cartilage was complete, and the cavity of the joint filled with vascular new growth. The tissue of the bones was somewhat soft and spongy, but I could not find any carious or necrosed bone.

In this case, the entire articular surface of the humerus, the olecranon, and coronoid processes of the ulna, and the head of the radius, were removed.

The edges of the incision were adjusted with stripes of lint, and the limb was supported on a splint and pillows, and bent at the elbow at an obtuse angle. The patient was free from acute pain in a few hours after the operation, and at no time subsequently did he suffer from the acute and severe racking pain which attends suppuration of a joint. His diet was now of a more stimulating nature; and he soon regained his appetite, and took food freely. He slept well, and gained strength. A free discharge of healthy pus took place at the wound, which was dressed with wet lint; and by degrees, although very slowly, it healed. This slow healing was dependent upon the low degree of reparative power enjoyed by the patient, who doubtless was all along suffering from the effects of the disease in the pulmonary organs.

Six months after the operation, he had improved in health and strength. The soft tissues around the elbow had become firm, and regained their healthy condition. A little discharge still runs from one or two sinuses, but he is quite free from pain. He can move his fingers freely.

He passed the season of 1858 at the Royal Margate Sea-bathing Infirmary, and there the most rapid improvement took place. His general health became quite established, and the local disease healed up entirely. When he returned to London, in October, he could use his hand freely, and move the limb at the elbow to some extent.

CASE IV. *Stiffness in the Left Elbow-Joint for one year before a Contusion of the same; Inflammation; Suppuration; Abscesses; Excision of the Joint; Recovery.* Glazsner, aged 17, was admitted on August 11th, 1858, stated that, in March 1857, he felt a stiffness in the left elbow, for which he could not assign a cause. This stiffness continued until March 1858, when he fell down, and contused the stiff elbow. From this moment the joint became worse and worse; inflammation was set up; suppuration took place; an abscess formed, and was opened; and his general health declined under the sufferings he endured. He said he had always enjoyed good health, and been robust and strong, previous to the disease of the elbow.

When admitted he seemed to have been much reduced by the disease; he was worn out with pain, profuse discharge, and want of sleep. The left elbow was semiflexed and very much enlarged, the soft parts were infiltrated and ulcerated in two places, on the outside and inside, and there were sinuses from which purulent discharge escaped. The limb was kept at rest as much as possible by means of stripes of lint and a splint, and his general health was attended to.

August 17th. I excised the elbow joint by making a single

longitudinal incision in the vertical axis of the limb, and on the posterior surface. The soft tissues being reflected, the olecranon was cut off, and the joint at once exposed by flexion. It seemed to be completely disorganised, and was filled with soft, flocculent, vascular granulations, and the cartilage on the ends of the bones was destroyed. I next sawed off the articular ends of the humerus, radius, and ulna, and of these the portion of the humerus was the only one showing any diseased tissue. In its cancellated tissue was a circumscribed tubercle, through which the section had been made, and the dry preparation demonstrates the cavity which was occupied by the tubercular deposit. I gouged out the bone tissue surrounding that portion of the tubercle left on the shaft of the humerus, and dressed the wound with moistened lint. The arm was placed on a pillow and bent at the elbow at a very obtuse angle. The tissue of the bones was healthy, with the exception of that above described.

This patient progressed very favourably, the limb being supported on a splint and carefully dressed with wet or dry lint, according to the amount of discharge. The pain he suffered before the operation was immediately relieved, and his health became quickly restored.

He left the Hospital on October 27th, or ten weeks after the operation, free from pain, the wound nearly healed, and in good health. Since that date, he has gained strength in the member; he has some amount of movement at the elbow; and now, March 1859, he has resumed work.

REMARKS. These cases are examples of partial and complete excision of the elbow joint. The first and second are instances in which only portions of the joint were removed. In the child the olecranon ulnæ and a small portion of the shaft were cut off, which necessarily gave rise to a free incision into the joint, and the opportunity for the escape of all pus collected at the time, or which might subsequently form. And this I take to be the *rational* of the successful issue of these cases, in which the olecranon only is excised. It is true that in this case the upper extremity of the shaft of the ulna was diseased, and this was probably the primary cause of the disease of the joint. That piece of diseased bone being excised, the nucleus of the disease was removed; and after the destruction of the articular cartilages, repair would ensue. In the second case, I removed all the articular surface, with the exception of that of the radius, which, at the moment of the operation, appeared to be perfectly healthy. The slice off the humerus was small, and scarcely, perhaps, comprehended the entire articular surface. This case was unsuccessful, and the patient preferred to lose her arm rather than submit to a second excision operation. There can be, however, I think, little doubt but that a second operation, and removal of the diseased ends of the bones, might have been attended with a good result, and I should infer, from the examination of the preparation, that in a similar case such a practice would be quite justifiable.

Both the cases of the young men were select cases for the operation, so far as the local disease was concerned, and had the constitutional and reparative powers of the man Baker (Case III) been more favourable, he would, in all probability, have made a more rapid convalescence, and satisfactory cure. In this case less of the ends of the bones were removed than in the last, and the personal experience of these operations leads me to regard the taking away of a fair quantity a great point in the successful issue of the case. In the fourth case I cut off more of the bones, and I think the case has advanced more rapidly and satisfactorily than the third, although this might be attributed more to the superior constitutional powers of the individual, than to the local treatment simply.

In order to advance the discussion of this interesting surgical subject, I will read the following conclusions.

CONCLUSIONS. 1. The value of the hand and arm being so great, every attempt should be made to save the member, by removing local disease before proceeding to amputation.

2. The introduction of this operation into the practice of the London hospitals dates back to the time of the publication of Mr. Blackburn's paper in the *Guy's Hospital Reports*, vol. i.

3. Conservative surgery has been taught and practised at Guy's Hospital for twenty-five years at least; for in 1835 Mr. Key performed excision of the elbow joint, and it has been uniformly the rule to do so ever since, in all suitable cases. (See also cases by B. B. Cooper, vol. vi.)

4. Although the constitutional diathesis and powers of the patient exert a great influence on the successful issue of these cases, yet the operation may be performed with a reasonable hope of success under very untoward hygienic conditions.

5. When the performance of this operation is determined upon in the adult, it is important to the successful issue of the case, that the whole of the articulation should be removed, and very freely.

Lastly, I invite criticism, and hope that no member of the society will refrain therefrom from fear of hurting the susceptibility of the author.

ST. GEORGE'S HOSPITAL.

MALIGNANT DISEASE OF THE HUMERUS: AMPUTATION AT THE SHOULDER-JOINT.

Under the care of H. C. JOHNSON, Esq.

WILLIAM B., aged 31, was admitted on February 16th, under Mr. Johnson's care, on account of a tumour in the right arm, of which he gave the following account. In April last, he was aiming a blow with a stick, and missed his object. The arm was fractured by the effort. The arm was put up in a starch bandage, and in six weeks the fracture was united; but, some short time afterwards, he noticed that a swelling existed about the seat of fracture, which gradually increased, and latterly with more rapidity. He stated that he had felt some pain in the affected arm for about three weeks before the accident, of a rheumatic nature. Similar pains had also been felt in the opposite arm, but they had quite disappeared for three months. At the junction of the upper and middle third of the right arm was a tumour, of an oval shape, and about as large as a good sized melon, reaching down to within about two inches of the elbow. The tumour was more prominent externally, but appears to lap round the bone. The arm was bent somewhat outwards, and was an inch shorter than the sound arm. The consistence of the tumour was apparently solid, but elastic; there were very large veins on its surface. The bone above it appeared somewhat enlarged and hardened. The motions of the elbow-joint were quite free. He looked emaciated and worn, and had been losing flesh and strength of late.

He remained in the house for a few days, during which the tumour increased rapidly.

On February 23rd, the arm was removed at the shoulder-joint. A very large number of ligatures were used (as many as thirty-five); nevertheless, in a short time it was found that secondary hæmorrhage was going on; so that it was necessary to open the flaps again, and as many as thirty more bleeding vessels were ligatured.

There were no other unfavourable symptoms about the case. The wound healed with no extraordinary amount of suppuration, and was almost closed when he left the house.

He was last seen on April 12th, and was then much improved in health and appearance.

On examination of the humerus, a longitudinal section of which had been made, it was found to be broken in two just below the tumour. This had probably been done in the sawing. The tumour was of large size, round, with a cyst of some size in the middle, sessile on the outer surface of the bone, the medullary cavity of which was closed by a soft deposit, apparently of a malignant character, for some distance above it. The compact tissue was much thickened above, but was thinned just below the tumour, and, as already mentioned, had been broken there. The tumour showed, in some places, well marked cancer-cells; in others, it had undergone a process of fatty degeneration. In the deposit which occupied the shaft, only fibrous elements were discovered.

The parts were exhibited at the Pathological Society.

REMARKS. The above was a very well marked instance of soft cancer springing from the bone, and causing, as malignant disease so frequently does, absorption of the bony elements to such an extent that the bone will give way under very slight force. The tumour was in all probability the cause, and not the consequence, of the fracture. The diagnosis was not for an instant obscure, so evident was the cachexia resulting from the disease, and so characteristic the rapid growth of the tumour. Nor was the relief to the general health from removal of the disease less marked. It will be interesting, at some future period, to record the further progress of the case.