A FEW CASES ILLUSTRATING THE RESULTS OF OPERATIVE INTERFERENCE FOR FRACTURES ABOUT THE ELBOW-JOINT.

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(Plates II.–IV.)

I have picked out a few of the more complicated cases from a number of fractures on which I have operated, showing what may be done to remedy various forms of solution of continuity of the bones about the elbow-joint, and in doing so I have avoided selecting showy and very successful cases, but, rather than that, have chosen those that have made me hesitate as to the best mode of treatment or have caused me much anxiety.

Case 1.—Fig. 1, Plate II., represents a compound fracture of the lower end of the humerus, which came under my care several days after the injury. It was produced by a fall from a horse on the hard road. The skin and soft parts over the fracture were lacerated and fouled, and the fragments of bone projected outwards. The wound was treated as soon as possible after the injury, but it was recognised that the damage to the bone was too extensive to be met by other measures than a wiring together of the broken ends. He
was sent up to London and placed under my care. The seat of fracture was freely exposed, when it was seen that there was extensive comminution, the fragments being very loose. The condition as shown in the radiograph was the best possible that could be obtained after much manipulation, and it was perfectly clear that if something were not done to restore the continuity of the humerus and so render the arm efficient, the patient, an officer, would have to resign his commission, a matter of very serious importance to him.

As the comminuted fragments were so much crushed and forced apart from one another by the force of the injury, very great difficulty was experienced in bringing their broken surfaces into any sort of accurate apposition, and the drilling and wiring entailed a considerable expenditure of time and trouble. The truncated lower extremity of the upper portion of the humerus was finally fitted and sutured more or less firmly into the interval between the lower fragments. Some trouble arose later from a lighting up of infection in the lacerated tissues, but this was met by prompt interference. The result is shown in Plate II., Fig. 2. The range of flexion and extension was not complete, but the angle through which the forearm could be moved upon the humerus was quite sufficient to allow of his joining his regiment in South Africa, where he has seen much service since. Here one had to deal not only with a large, foul wound, but with much crushing and laceration of the soft parts, and of the ends of the bone, rendering it impossible to fit the fragments together with perfect accuracy. This radiograph, being taken laterally, gives us no idea of the size of the wire loops, which was much greater than it appears here foreshortened.

Case 2.—The next case is that of a gentleman who was thrown from his horse, which, when he was on the ground, trod on the outer aspect of the right elbow. Fortunately, the ground was very soft, so that the skin and subjacent tissues escaped the laceration one would otherwise have expected from the animal's hoof. From a careful examination it was at once apparent that there was some fracture of the head of the radius, which interfered with flexion and extension of the forearm, and obliterating pronation and supination almost absolutely. He was sent up to London and placed under my care. The radiograph (Plate III., Fig. 3) showed that a portion of the outer and anterior segment of the head of the radius had been broken off and displaced forwards. If the fragment were left in this position he would not in future be able to flex or extend the arm beyond a very limited extent, and there would very likely be no possibility of his regaining movements of pronation and supination. Besides this, he was anxious to go abroad and lead an active life, which he could not do without a thoroughly useful arm. The treatment rested between excision of the fragment and of the rest of the head of the radius, or uniting the broken piece to the radius in its proper position. I cut down on the radio-humeral joint and divided the orbicular ligament vertically, separating its segments widely. The loose and detached fragment was then fitted accurately in its normal relationship into the gap left in the head of the radius, and was wired there by means of fine virgin silver wire. The cut ends of the orbicular ligament were sutured together, and the wound was closed. The progress
he made was most satisfactory. After three weeks had elapsed, movements of flexion and extension of the elbow were commenced, and were steadily increased, no serious opposition being experienced. Later, pronation and supination were attempted. After a very moderate range of movement was effected, some resistance to further movement was experienced, and the resulting degree of rotation of the radius on its axis was inconsiderable. The result was, that while the patient was able to flex and extend the forearm almost perfectly, the rotation of the bones of the forearm on one another was far from perfect. He is now able to play cricket and shoot as well as before the accident. The skiagraph showed that some slight displacement of the fragments had ensued subsequent to the operation, and had probably resulted from my attempting to rotate the bones on one another before union had been sufficiently strong to resist the strain upon the adhesions which had probably formed between the opposing surfaces of radius and ulna. I believe that I would have ensured a perfect result if I had delayed movement till a later period, as it is possible that cartilaginous surfaces take a longer time to unite firmly together than bone does. At the same time, although I obtained what the patient considered an arm which he found perfectly useful for every purpose, I wondered whether, under these special conditions, it would not have been wiser to excise the remainder of the head of the radius. This I determined to try in the next case that came under my care, in order to obtain some definite facts as to results.

Such a case soon came under my care.

Case 3.—A gentleman was thrown heavily off his bicycle, falling, he believed, upon his hand, the arm being almost completely extended. He came under the care of a very able surgeon, who asked me to see him, a few days after the injury. He had had him radiographed without delay. This (Plate III., Fig. 4) showed that the patient had sustained a fracture of the head of the radius, the anterior half of which had been broken off vertically from the remainder of the head and horizontally from the upper limit of the neck. It had been displaced forwards in such a position as to render the arm quite useless unless some operative measure was resorted to.

Accordingly, the seat of fracture was freely exposed, and an endeavour was made to fit the fragment accurately in position. Owing to much laceration of the soft parts and to some irregularity of the margins of the bones, I found it very difficult to effect perfect apposition, and I therefore decided to remove the remainder of the head of the bone. This was done, and the wound closed. Recovery of movement was very much more slow and certainly more painful than in the last case. The result, after about two years, is that pronation and supination are almost perfect and powerful. Extension is nearly complete, flexion is limited to 90°, the resistance being apparently in the soft parts posterior to the joint. He plays golf, etc., with ease, and is quite satisfied with the articulation.

On the whole, the mechanical result is not as good as that obtained by restoring the head of the radius to its normal form, so that in future, unless there is some serious obstacle, I intend to wire
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on or otherwise secure the fragment, and take care that movement is not attempted till union is perfect.

Case 4.—Fig. 5, Plate III., represents a condition one meets with very commonly in children. It presents, however, two features of interest. One was the very considerable outward displacement associated with the backward displacement which rendered the mechanics of the elbow-joint hopeless. The other was a lapse of about sixteen days since the receipt of the injury. These two circumstances combined to make the operative procedure much more trying than one usually finds it in this variety of fracture. The seat of fracture was freely exposed on its inner aspect, and, as was expected, much difficulty was experienced in replacing the fragment in a position, which was nearly but not quite perfect. It was then fixed in this relationship by a wire which passed through it and the inner limit of the shaft. The range of movement in the elbow-joint and the relationship of the bones of the forearm to the humerus seemed perfect. The subsequent progress of the case was very satisfactory.

As a rule, in this form of fracture an excellent working result with but a slight amount of deformity is obtained, if the arm be put up at once in a position of extensive flexion. I mention this as operative interference is often very difficult and sometimes unsatisfactory in young children, because of the cartilaginous condition of the fragment, which renders it very difficult to secure it in position without leaving a foreign body projecting into the cavity of the joint, and giving trouble later. It is the outward rather than the backward displacement that renders replacement difficult in some of these cases.

Another fracture about the elbow-joint that frequently calls for operative interference, especially in young life, is that of the radius in the upper part of its shaft. These cases are rarely operated on at the time the injury is sustained, but come first under the care of the operator when the splints have been removed. In the first instance the arm is put upon an internal angular splint, with the forearm in a position midway between pronation and supination, the hand being placed vertically, the thumb upwards. When this splint is taken off for the first time, it is found impossible to supinate and pronate the forearm. The patient is usually a child, and the mechanical depreciation, if at all marked, is sufficient to unfit it for many occupations, and especially for a service. Such cases come very frequently under observation, and require very careful operative treatment, since to restore the axes of the bone to their normal relationship the radius has to be divided in two oblique planes, which usually cross each other at an angle of about 90°.

Such fractures, when affecting the radius alone, show very little in a radiograph, unless it is possible to compare it with the condition of the other arm. This unfortunately multiplies plates, so I am illustrating this by a case in which the displacement is very considerable because of fracture of the ulna also.
Case 5 (Plate IV., Fig. 6), in which, besides the fracture of the radius with much displacement of fragments, there is a fracture of the ulna in two places. This case did not come under my care till three months had elapsed since the receipt of the injury, when the arm was quite useless. The presence of an abundance of callus and the change in texture which the ends of the fragments had undergone, rendered our operative measures difficult and tedious. The bones were restored almost perfectly to their normal form, very extensive incisions having to be made to effect the restoration.

Case 6 (Plate IV., Fig. 7) shows a fracture which is by no means uncommon though not often recognised. An officer was thrown off his horse, and dislocated both bones of the forearm backwards. The dislocation was reduced, and he was directed to move the elbow-joint freely. He was quite unable to do so, the arm being kept rigidly flexed at a right angle. He was regarded as neurotic, and, being unfit to continue on active service, was invalided home from South Africa. An examination of the elbow showed that flexion was opposed by the presence of a hard bony mass, which could be felt projecting forwards in the situation of the coronoid process, while extension appeared to be affected by the lump of bone being situated in or beneath the brachialis anticus. An examination under the X-rays confirmed this diagnosis, and showed that the apex of the coronoid process had been broken off at the time of the injury, and that an abundance of callus had formed about the displaced fragments and about the surface of the coronoid process from which it had been broken. If this had been recognised at the time the injury was sustained, it could have been treated perfectly and simply by screwing the detached fragments on to the remainder of the coronoid process. Of course this could not be done at this stage, so I had to satisfy myself by excising the fragment and callus till I was able to flex and extend the arm completely. Even then a very long time elapsed before the muscles and ligaments were sufficiently stretched and had become resilient enough to enable the patient to move his arm spontaneously and painlessly within a full range.

This case illustrates exceedingly well the advantages of a scientific operative treatment of fractures, over the old-fashioned feeble methods which have been adopted till quite recently. If this patient had been submitted to a simple operation, in the first instance, he would in all probability have been able to resume his duties in six weeks at the very outside, having had a painless convalescence, while as it is he has been lost to the service for at least a year, and his health has been seriously affected by the pain he had to endure in the attempts made to obtain movement before the operation, as well as after it. The surgeon who will not hesitate in the slightest to mutilate his patient to any extent to remove some of the mechanical disability resulting from a badly united fracture, cannot tear himself out of the groove in which his mind has been trained, sufficiently to restore the broken bone in the first instance to its normal form, and the physiology and mechanics of the patient to their normal state, because he cannot
conceive it advisable to convert a simple fracture into what his conservative instinct defines as a compound one, forgetting that a so-called compound fracture is presumably in a large proportion of cases a foul wound, while the wound made by the surgeon to restore a fractured bone to its normal form should never be a foul one.

I would urge most strongly on those who intend to operate on these cases, two very important rules:

One is, "Do not hesitate to make a sufficiently long incision," remembering that the length of incision adds nothing whatever to the risks or to the pain experienced by the patient, providing no important structure is cut through, and it enables the surgeon to thoroughly expose the fragments, and to bring and retain them in accurate apposition without offending the second rule, which is, "Keep your fingers out of the wound."

If these two simple rules are observed, we will hear no more about the difficulty which many surgeons experience in the use of screws in recent fractures, where necessary or advisable, either in their not holding or in their working loose, and having to be removed, or in their being unable to bring the fragments into accurate apposition. I have seen radiographs of fractures which have been treated in this way, in which the screw has perforated fragments which were not in accurate apposition, but were overlapping one another. What practical object was hoped to be gained by such a procedure, it is difficult, if not impossible, to understand. The explanation lies in the fact that these operations are often very much more troublesome than can be conceived by the surgeon, who has been brought up on an utterly false and misleading creed, and, in plain English, he, being unfamiliar with the obstacles to be overcome, and perhaps also with the use of the screw, makes a hopeless muddle of the business.

Regarding the treatment of fractures by means other than operation, I think it might fairly be asked of those in charge, that every case, when put up, should be carefully examined on the screen and radiographed in the worst position. As I have said before, I have no doubt that the law courts will seriously interfere with the continuance of old methods, and hasten the general application of new ones.

I would like to call attention to an excellent address on this subject, delivered at the opening meeting of the Surgical Section of the Royal Academy of Medicine, Ireland, by Mr. Myles, the President of the Royal College of Surgeons of Ireland. It is entitled "Operative Treatment of Fractures," and is published in the Clinical Journal, 19th February 1902. It will be seen that Mr. Myles has treated the question in just the manner that a most skilful and progressive surgeon, confident in the perfection of his aseptic precautions, and thoroughly familiar with the difficulties of the subject, would.