Clinical Remarks

ON

THE OPERATIVE TREATMENT OF SIMPLE FRACTURES.

[WITH SPECIAL PLATE.]

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It is now more than thirteen years since I devised the operative procedures in the treatment of simple fractures of the long bones which I have systematically employed since with uninterrupted success. The early and somewhat violent opposition to this method of mine, by which fractured bones can be restored accurately to their original form, has now completely died away and the operative treatment of simple fractures is now recognized as the most efficient means we have at our disposal.

The operative treatment of simple fractures is comparatively simple in the large majority of cases, and if due care be taken and reasonable skill be exercised the risk is practically nil.

In a certain small proportion of cases the bone may be too friable or too thin or too much broken up, and the surgeon may therefore be unable to restore it completely to its original form. Even in these circumstances he can almost always obtain a much better result by operating than by any other form of treatment. Many complaints have been made by surgeons who have failed to obtain good results by operation. For example, some have said their screws would not hold, and others that they could not obtain union. These failures are due to the fact that the very moderate cleanliness necessary to obtain a good result in ordinary operations is quite insufficient to meet that required when a large piece of metal, whether steel or silver, is left buried in the wound.

If the surgeon has not succeeded in such a simple operation as wiring fractures of the patella without killing or permanently disabling many of his patients, he had better bring himself to believe that the results of the generally accepted methods of treatment are excellent, and that any statements to the contrary are exaggerated or imaginary, and leave operations on recent fractures alone, since they may test the methods and skill of the operator to the utmost.

In performing these operations, not only must you not touch the interior of the wound with your hands nor permit the patient's skin to do so either, but you must never let any portion of an instrument which has been in contact with your skin or with that of the patient touch the raw surface. All swabs must be held in forceps and applied to the wound in that manner. They should not be handled in any way previous to being used. After an instrument has been used for a length of time, or forcibly, it should be reboiled or placed in a germicidal solution.

I have occasionally seen beginners employ the handle of a knife or dissecting forceps to separate adherent parts, or to displace some structure, instead of using the particular instrument made for that purpose. I need not remind you that this must not be done on any pretext whatever. It is probably unnecessary to say that no germicidal or other liquid should be introduced into the wound.

MODE OF OPERATION.

The details of the operation are as follows: Get the skin thoroughly clean. This may sometimes take several days, as the thick indurated epidermis of the foot and knee is often difficult to remove. I find large moist compresses with careful scrapings most effective in enabling one to get rid of suspicious material. When this has been properly done, a germicide should be applied to render the skin as clean as possible. Choose a situation for your incision which will involve a minimum chance of damage to important structures and a maximum advantage from the point of view of accessibility.

Do not hesitate to make an incision of a length sufficient to enable you to deal effectually with the fragments. There is no greater mistake than to increase the difficulty of the operation by employing too small an incision. Its length adds in no way to the risk the patient runs, but usually adds to his safety, since it enables the surgeon to deal with the fragments more readily. Having made the incision, exclude the skin of the patient from the wound. This can be done

very well by attaching sterile cloths to the cutaneous margins of the incisions by forceps such as those illustrated in Fig. 1.

The fragments are exposed and examined, and when all clot and material intervening between them have been removed they are brought into accurate apposition. To do this much traction may be necessary, combined with the leverage action of elevators and the approximating influence of powerful long-handled forceps. The long forceps I employ are very powerful, and are made with a limited grasp to facilitate their use. They are illustrated in Fig. 2.

If there be any bleeding, I employ strong compression forceps long enough to allow that portion of the handles which have come into contact with the fingers to protrude beyond the area of the wound. Their grip is sufficiently firm to occlude the vessel if they are kept on for a time, and so the necessity for a ligature is obviated. Fig. 3 represents this instrument, the head being shown full size also.

Having obtained accurate apposition, you employ screws, silver wire, or staples to retain the fragments in apposition. In some conditions one of these instruments is more advantageous than another, while in others they may all be used advantageously to obtain a perfectly firm secure junction.

Generally speaking, the screw is by far the most efficient and most powerful means by which the fragments can be retained immovably on one another. Remember, in gauging the size of the drills you intend to employ in drilling the hole for any particular screw, that the calibre of the barrel of the screw is much larger than that of the thread, and that an aperture in dense bone which readily admits the thread may be much too small for the barrel, and, if the screw is driven into it, the bone may be hopelessly comminuted. The drills and screwdrivers should be of sufficient length to avoid any risk of the fingers touching the wound. Fig. 4 represents the handle and bits which I find most serviceable. If silver wire be employed it should be pure, and before use it should be raised to a red heat in a flame to increase its flexibility.

The form of staple I now employ resembles that devised by Dr. A. Jacoe¹ and has since been slightly modified by Dr. Duja². They are peculiar in that the portions which penetrate the bone are serrated transversely to prevent their working out.

If you expect much oozing, a drainage tube may be employed for a day or two with advantage. In most cases a splint is required after the operation, but occasionally, as in fracture of a femur ankylosed at the hip joint in a position of considerable flexion, it may be impossible to employ any support.

CASES.

This is well brought out in the case of a woman, aged 46, who had sustained a fracture of the right femur about its middle third. As long as she could remember the right hip-joint had been fixed in a position of considerable adduction and flexion. She had compensated for the considerable shortening by the use of a boot with a thick cork sole. The radiograph showed that the femur presented a spiral fracture, and that both fragments were more or less comminuted.

Owing to the position of the ankylosed limb it was clear that the femur could only be restored to its original form and functions by operation, and that failure to do this would be disastrous to the individual, since all her mechanics had been modified in consequence of the deformity.

The fragments were exposed through a vertical incision in the outer side, and extending along the length of the thigh. The several pieces of bone were successfully laced together by stout silver wire, and the connexion had to be rendered sufficiently strong to ensure immobilization of the bone without the use of a splint, which could not be applied under the circumstances.

Fig. 5 shows the perfect condition of the limb four months after the operation. The patient lay on her back during convalescence, the deformed leg resting for support on its normal fellow.

Figs. 6 and 7 illustrate a case of simple fracture of the lower end of the femur in a boy aged 15. The injury was a very serious one indeed, and but for the prompt treatment of the doctor who saw him immediately after the injury it would probably have resulted disastrously, since the inner sharp margin of the lower end of the shaft had almost pierced the skin. The fracture was accompanied by laceration of the adductor muscles and by effusion of blood about the great trochanter. Every attempt at restoring the lower fragment to its normal position resulted in failure. The fracture was exposed by a vertical incision along the inner aspect of the

leg, and with considerable difficulty the lower fragment was restored to its normal relationship to the shaft. The line to the left of the shaft of the femur in Fig. 7 indicates the periosteum which was detached by the accident. It was

Fig. 1.

retained immovably in position by the use of three staples which perforated the bone at various angles. The subsequent progress of the case was as satisfactory as it was uneventful; the functions of the joint were gradually restored.

Fig. 8 illustrates a case of fracture of the tibia and fibula, the fracture of the fibula being too high up to be shown on the plate. The tibial fragments were brought into apposi-

Fig. 2.

tion by means of traction, approximation forceps, and elevators. As the fracture involved a shorter length of the tibia than usual it was necessary to employ a long screw run in very obliquely, and supplemented by a couple of strong

silver wires which assisted in retaining the fragments immovably in position.

Fig. 9 illustrates a serious injury of the forearm in which

Fig. 3.

both bones were broken and the planes occupied by the several fragments altered very materially. As the damage was produced by direct violence, there was much injury to the soft parts and considerable extravasation of blood and consequent inflammation. By means of free incisions and much manipulation the fragments were got into very fair apposition. Fig. 10 represents the result obtained some months after the injury when the normal functions of the arm were restored almost perfectly. Had an extensive operation not been performed, the arm would have been practically a useless one.

Fig. 11 illustrates the condition of a bad Pott's fracture,

Fig. 4.

which term may be more scientifically described as comprising the various fractures which result from excessive abduction of the foot. In this as in most severe cases the foot was dislocated backwards very considerably. An oblique incision

Fig. 5.—Femur four months after operation for spiral fracture.

Fig. 8.—Fracture of tibia treated by screw and wire.

Fig. 6.—Fracture of lower end of femur.

Fig. 7.—Same case as Fig. 6, after treatment, showing staples.

Fig. 9.—Fracture of both bones of forearm.

Fig. 10.—Same case as Fig. 9. after treatment.

Fig. 11.—Pott's fracture of ankle.

Fig. 12.—Same case as Fig. 11. after treatment.

was made over the inner aspect of the ankle-joint, and through it the tibia was brought backwards till the broken fragment could be fitted accurately in position. A screw was driven through the malleolus into the lower end of the tibia, fixing the fragments securely in apposition, and restoring both the tibia and fibula to their normal form. The result was excellent (Fig. 12), the patient rapidly regaining the use of the limb.

These cases illustrate very well the use of the several appliances—screw, wire and staple—under varying conditions, and all with complete success.

I may say that age is no barrier to operation; indeed, in old people an operation is often more imperatively called for than in vigorous life, for the reason that prolonged recumbency in old age is a very serious matter, often entailing of necessity a fatal result. The shock sustained because of surgical interference is trivial, and old people bear operations very well indeed.

REFERENCE.

¹ Une agrafe pour sutures osseuses, *La Presse Médicale*, December 25th, 1901.

OPERATIVE INTERFERENCE IN FRACTURED CLAVICLE.

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THE patient, No. 6074 Private A. E. S., 5th Royal Irish Lancers, was admitted into my wards in the Colchester Station Hospital on March 28th, 1903, having sustained a fracture of the left collarbone, which was treated by Sayre's method. At the end of three weeks, however, there was no sign of union or of any formation of callus; the ends of the bone were, therefore, well rubbed on each other, and the arm secured as before.

After the lapse of another fortnight, there being still no evidence of any attempt at union, the arm was simply placed in a sling, in the hope that the somewhat limited mobility thus allowed would excite the formation of the encircling callus usual under such circumstances.

By the end of May, however, not only had the clavicle remained ununited but there was not the slightest evidence of any preparation for union, and the patient was very anxious that "something should be done" to enable him to return to his duty—an anxiety which was increased by the fact that a comrade who had been admitted on March 29th had now been discharged from the hospital. I therefore decided to cut down on the clavicle and wire the fragments.

Adopting Mr. Barker's plan¹ I turned up a semilunar flap including some muscular fibres, and exposed the clavicle. There was no false joint, as in Mr. Barker's case, and no formation of any ensheathing callus, but merely a very thin layer between and strictly limited to the surfaces of the fracture.

I decided not to remove any bone, but after refreshing the surfaces, I passed a stout silver wire from above downwards and a little forwards, about $\frac{1}{2}$ in. from the ends of each fragment. The wire was tightened and twisted, thus securing firm apposition, and the ends were nipped off and bent well under the bone to guard against any subsequent irritation from the pressure of braces or shoulder straps.

The wound, which was dressed with iodoform gauze and a large pad of salicylic wool, healed readily, though there was some little delay from a small stitch abscess.

The arm was secured to the side by firm bandaging, and there was at no time any exuberant formation of callus. The man was discharged on "sick furlough" on July 14th with an apparently firmly-united clavicle and with no impairment in the mobility or usefulness of the arm.

If I may venture to express an opinion, I think that this operation might be performed more often than it is in the case of delayed union of the clavicle, with the advantage to the patient of a considerable saving of time, and in those cases of deformity, especially in women, produced by a vicious union, Jacobson considers the procedure quite justifiable. The structures beneath the clavicle are, as the same authority points out, rendered quite safe by the interposition of the subclavius muscle.

My thanks are due to Major Beyts, R.A.M.C., for his kind assistance during the operation.

REFERENCE.

¹ Jacobson's *Operations of Surgery*, vol. i, p. 187, 1902.

A CASE OF CONGENITAL SYNOSTOSIS OF BOTH UPPER RADIO-ULNAR ARTICULATIONS.*

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THE defect in this case is clearly shown in the two radiographs which are here produced. There is a complete bony fusion of the radius and ulna at their proximal ends in both arms. I have described it as synostosis because the condition is congenital, as the history will show, rather than

Fig. 1.—Normal elbow (for comparison).

ankylosis, because this term is generally applied to the result of a pathological process, such as acute suppurative arthritis, tuberculous joint disease, or chronic rheumatism.

The patient is a man aged 32. His mother, who is alive,

Fig. 2.—Congenital synostosis of right upper radio-ulnar articulation.

gives a very clear history of the case. Nothing unusual was noticed until between the age of $3\frac{1}{2}$ and 4 years, when he was

* Read before the Monmouthshire Division of the British Medical Association (and patient shown), November 25th, 1904.