THE TREATMENT OF FRACTURES ABOUT THE ELBOW-JOINT AND KNEE-JOINT.

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THERE are perhaps no fractures in the body that call for greater care and patience in their treatment than do fractures in the immediate vicinity of the elbow-joint and knee-joint. In medical practice it must have been the lot of many men to have witnessed most unsatisfactory end-results, where stiffness, deformity, and marked restriction of movement have played the chief part. This end-result in most cases has not been in any way from want of perseverance or patience on the part of the medical attendant, for in a number of old cases that I have seen which had been treated by others, and in which there had been exhibited the most conscientious efforts, the end-results were unsatisfactory.

These two joints are indispensable to people in the richer walks of life, and specially to the bread-winner, and it is for this reason that I venture a few hints which I have found to give, in the majority of cases, the most satisfactory end-results.

These cases, over 100 in all, have come from the casualty departments of the Royal Free Hospital, London, King's College Hospital, London, and the Bradford Royal Infirmary. At the latter institution fractures in the region of the elbow-joint have been very numerous, and an excellent opportunity has been afforded of watching them over a period of more than a year, and gaining new points in the treatment, all of which have served to gain a more perfect end-result.

Elbow-joint.

The commonest types of fracture in the region of the elbow-joint have been the following:

(a) Separation of the lower epiphysis of the humerus, and with it a small piece of bone from the diaphysis.

(b) Separation of the lower epiphysis of the humerus, complicated by a fracture of the epiphysis itself, running into the joint.

(c) Fracture of the lower end of the humerus, either transversely or running obliquely into the joint.

(d) Fracture of the olecranon process of the ulna.

(e) A fracture of the head of the radius has been rare in this series.

(a) and (b) have usually occurred in young children up to the age of 12, but mostly about the age of 5. (c) and (d) have been the class of cases most common in adults. These fractures were far more common in girls than in boys. They are easily diagnosed, though their extent is often deceptive. They are at once, as a routine procedure, x-rayed. In young children (and it is to these cases that I particularly wish to refer) it is of the greatest importance to gain the small patient's confidence, and throughout the treatment infliction of pain should absolutely be avoided. For this reason an anaesthetic is always administered before the fracture is dealt with.

The method of fixation of the fracture is that advocated by Mr. Robert Jones, of Liverpool, namely, by full flexion of the elbow-joint. If there be much swelling about the elbow when first seen—and such is frequently the case—this is no contraindication to full flexion. Some of these cases, specially in adults, have presented considerable swelling, and after putting up the fracture it has been very difficult to make out a radial pulse. The swelling rapidly subsides, and I have never seen any harm whatever follow full flexion in these cases. In putting up the arm the carrying-angle must not be forgotten; I have found that the safest way is to flex the sound arm, and to make the injured arm, when flexed, as near a match to the sound arm as possible—that is, when full flexion is obtained the hand and forearm lie internal to the upper arm. This is not usually advocated, but I have found it give the truest results.

Having obtained full flexion the desired position is maintained by a piece of ordinary adhesive strapping passed around the forearm and upper arm nearer the wrist than the elbow and nearer the shoulder than the elbow. Beneath the strapping, which should be between

1½ in. and 2 in. wide, is placed a strip of boracic lint. By this means most of the upper arm and forearm are left bare, and over the elbow is placed a piece of lint soaked in some evaporating lotion. The arm so treated is put in an ordinary sling, and is not bandaged to the side; the patient uses the wrist and shoulder joints. He is usually retained for three hours after the anaesthetic and care taken to examine the hand and fingers before he leaves the hospital. The hand is often blue and swollen, but the radial artery can usually be felt and the circulation in the hand is satisfactory. The patient is seen every day for the next two or three days, when the elbow and hand are inspected, and the patient sees others with a similar affection doing exercises, and frequently expresses a desire to do the same.

After the third day the elbow is very gently rubbed with a lubricant, usually olive oil, quite painlessly, and the patient is instructed how to do this at home. The patient is not seen again until the tenth day, when the strapping is removed, but no passive movement whatever is practised. The right of way for extension in my experience is never lost; it is the right of way for flexion that must be maintained.

When the strapping is removed the forearm will fall of itself past the right angle, and this for the time being is quite sufficient. The strapping is replaced by an elastic garter about 2½ in. wide, made from silk-covered elastic. A large length is kept in the casualty room and a garter to fit the case is rapidly made by the nurse. The patient now attends daily, and the garter is removed for about half an hour. During this time small playthings, such as a seaside bucket with a small weight in it or a dumb-bell, are held in the hand of the injured arm. Extension is by this means easily and painlessly increased up to an angle of about 160 degrees. After this half-hour the elbow and arm are very gently massaged and the elastic garter replaced. At the end of a fortnight the garter is omitted during the daytime and the patient is encouraged to use the arm, and at meals the sound arm is strapped to the body. When the child goes to bed the garter is carefully replaced, and on waking in the morning the arm is again in full flexion, and the right of way is thus maintained. At the end of the third week regular exercises, performed with light dumb-bells and designed to flex and extend the forearm, are started. The little ones enjoy the exercises, look forward to their visits, and there is a keen competition as to who can do best. At the end of the fourth week the patient is allowed to swing on the trapeze, and and at the end of this week the trapeze, assisted with gentle massage, usually suffices to produce full extension. At the end of the fifth week the arm is usually strong again, movements are free, and treatment can be discontinued. The aim is to make the whole treatment as much a pleasure to these small patients as is possible, and above all to avoid causing pain at any part of it.

The treatment as detailed above gave such satisfactory results—in most cases full flexion and full extension with no deformity—that it was adopted as a routine procedure in the casualty department.

It is all-important not to cause the patient pain if it can possibly be avoided. Forced movements should not be practised; they hurt the patient and break down adhesions around the joint which are often valuable at this stage; cause also further haemorrhage with consequent fibrosis and thickening around the joint—one of the surest forerunners of failure. It is not advisable to seek to obtain full extension too soon; it will come in good time without any forcible or painful movements. Should the error of too early and too persevering movements have been made, and consequent thickening, with stiffness, resulted, on no account should the attempt be made to obtain further movement by breaking down adhesions. It is better to start all over again by putting the arm in full flexion, leaving it for ten days or a fortnight, and giving the thickening a chance to disappear. The aim is to obtain flexion, as extension has, in my experience, usually looked after itself.

There are yet cases which despite care and patience do not do well; these failures I have especially noticed to occur in patients with a rheumatic tendency. Here fibrosis and thickening occur and increase while the arm is rigidly kept at rest. Massage in these cases is useless, and indeed often aggravates the condition. One or two

such cases have improved on arsenic and iodide, cataphoresis, and strapping the elbow with Scott's dressing. The latter treatment combined with the drugs has given the most satisfactory solution in this series. Another complication to be feared, and, I think, an unavoidable one, is the formation of new bone in the substance of the brachialis anticus muscle near its attachment, the so-called myositis ossificans traumatica. It has occurred in three of this series, and I know of no treatment that will cure it. If the new bone is removed it has been my experience to see it recur, and to recur in greater quantity than was present originally. In these cases flexion is limited to a right angle or less.

The last complication not to be forgotten, and one which again indicates painless treatment and early rest, is that these joints, after such an injury, are prone to infection. I have seen one case of tubercle follow such an injury in a child and one of gonorrhoea in an adult.

Treatment by full flexion applies to all fractures in the neighbourhood of the elbow-joint, except fractures of the olecranon process, and most cases of fracture of the head of the radius. In these two latter open operation is preferable—namely, wiring the olecranon and often excision of the head of the radius.

In adults movements may be practised by the surgeon, though such movements should not cause pain. Extension and flexion return more quickly in an adult than in a child, and suspension from a trapeze may be started between the third and fourth weeks.

Open operation for fractures about the elbow-joint, except for the two varieties mentioned above, has, I think, nothing to recommend it, and usually ends in bad results, especially in young children. If operation for deformity from faulty position some time after the injury is necessary, it is, I think, wiser to wait. A condition which seems hopeless at first can often be greatly improved by careful manipulation under an anaesthetic and after-treatment. Should these measures fail, it would seem wise to wait until the bones have stopped growing, and then plan some form of osteotomy. Open operation, however, should be the very last resort.

Knee-joint.

Of injuries in the neighbourhood of the knee-joint, only those involving separation of the lower epiphysis of the femur and fracture of the shaft in the neighbourhood of the condyles not involving the joint will be considered. The displacement here is reduced under an anaesthetic, and the knee is put in a condition of full flexion. It is strapped in this position just as in the treatment of the elbow-joint. Evaporating lotion is applied and a straight splint fixed on either side of the limb at the level of the strapping with buckle and straps. The knee is kept fully flexed for ten days or a fortnight and then is brought down to full extension and put up on a Liston's long splint with extension below the knee. If there is any bending of the limb laterally at the site of the fracture, it can at this stage be easily straightened under an anaesthetic. An x-ray picture should be taken after the limb is put up to see that the position of the lower fragment is satisfactory. At the end of five weeks, or often between the fourth and fifth weeks, passive movements should be started, and massage earlier, while the limb is still on the splint. The splint should be replaced after the passive movements and discontinued at the end of the sixth week.

These fractures are very troublesome to treat by other means, as the lower fragment shows a constant tendency to slip, and it is extremely difficult to fix it otherwise. Mr. Robert Jones advises full extension in these cases from the beginning. He says that surgeons, after performing femoral osteotomy for conditions such as genu-valgum, do not put up the limb in full flexion. I think there are one or two points he may have omitted to take into consideration. In an osteotomy the same kind of force has not been exercised to produce the fracture. Here the bone only is cleanly divided, and frequently only partially divided, without the laceration of muscles and forcible displacement that usually occurs in one of these fractures. I have tried the full extension method for this type of fracture and can only say that it has proved a failure, whereas full flexion has given the most satisfactory results.

Open operation for these fractures has, as a rule, nothing to recommend it.

THE USE OF IONIC MEDICATION IN THE TREATMENT OF CERTAIN VENEREAL DISEASES.

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I HAVE lately had an opportunity of trying the effect of ionic medication in cases of primary syphilis, secondary syphilitic ulcerations, gummata, soft sores, septic buboes after operation, and gonorrhoeal rheumatism. Instances of successful treatment of the last mentioned have already been reported, but, so far as I am aware, no cases of primary syphilis treated by mercury ionization have been published.

Treatment by ionic medication gave very satisfactory results in most of the above-mentioned diseases, but the results obtained by using the mercuric ion in syphilitic lesions are specially worthy of mention. The best results were obtained in those cases of syphilis in which there was no evidence of a mixed infection. In these the *Spirochaeta pallida* alone was the cause of the lesion, and the results were equally good whether the sore were an early primary chancre or an old chancre which had resisted treatment for some time.

If a mixed infection existed the healing was not so rapid; there was great improvement at first, probably due to destruction of the spirochaetes, but later on delay occurred; the ulcer remained clean but had a chronic appearance. As the secondary infecting organism may be of many varieties, it is impossible to lay down a rule as to the ion to use when the mercury has done its work. Probably the best results are obtained from the iodide or zinc ion. The worst results of all were in soft sores.

It is a common error to think that all sores occurring in a syphilitic patient, either in the early stages when primary and secondary signs are present, or later, when the early secondary manifestations have disappeared, are due to the syphilitic virus. Quite frequently a patient has both hard and soft sores at once, and in many cases a fresh infection of soft sores occurs while the patient is still under treatment for syphilis. Should this occur, it is very liable to be ascribed to renewed activity of the syphilitic virus and lead to renewed use of anti-syphilitic remedies. Such a sore as this heals very slowly and is disappointing to the surgeon, largely because of unsuitable treatment due to the mistake in diagnosis. Such a sore also causes disappointment in ionization if treatment with the mercury ion be persisted in. If the response to the mercury ion be not early and striking, the case should be regarded as probably non-syphilitic and treated by ordinary antiseptics, the ions of zinc, chlorine, or iodine being given a trial.

There is another class of case in which a healed primary syphilitic sore breaks down again. This may occur in spite of treatment by salvarsan and continuous mercury. These sores are very resistant to ordinary treatment, but readily respond to ionic medication with the mercury ion.

In the Royal Naval Hospital, Plymouth, it has been the practice to give internal antisyphilitic treatment as soon as the diagnosis is confirmed. This consists of grey powder gr.ij thrice daily, and to the majority of cases three injections of neo-salvarsan are given in addition. The first injection is given as a rule within a week after admission.

It may therefore be objected that the results shown below were really due to the neo-salvarsan or the mercury rather than the ionization, but several of the cases to be mentioned were almost completely healed before the first dose of neo-salvarsan was given, and the two most striking cases had no salvarsan at all. The improvement, too, follows so hard upon the first application of ionization, and is at once so marked, that to the observer there cannot be any doubt as to its cause. Also, certain stubborn cases which failed to respond to mercury and salvarsan cleared up rapidly on the application of ionic medication; and before this treatment was tried it was unusual for the primary sores to be healed until some time after the three injections of salvarsan had been given.

In the earlier cases treated the zinc ion was used with