POST-GRADUATE LECTURE ON

FRACTURES,

WITH EXPLANATORY X-RAY PHOTOGRAPHS,
ILLUSTRATIONS AND APPARATUS.*By* WILLIAM TURNER,
M.S., F.R.C.S.,*Senior Surgeon, Westminster Hospital.*

SYSTEMATIC X-ray examination has altered entirely the surgical treatment of fractures, and it has also shown conclusively that it is much harder to mend the fracture than to break the bone.

X-ray pictures, however, are necessarily only shadowgraphs, and consequently there is risk of distortion, and even of missing a crack, if taken in one direction only. Stereoscopic photography reduces this risk very materially, and it is advisable to resort to it whenever possible.

These distortions lead to much unwarranted litigation, patients bringing actions against medical men, or the people responsible for their accidents, or their employers under the Workmen's Compensation Act. An X-ray picture of practically any healed fracture will look unsatisfactory to the layman, and counsel will always make the most of this in the examination or cross-examination of any medical witness.

Owing to the actions that have been brought against medical men, it is absolutely necessary that early photographs should be taken. It sometimes happens that patients refuse to be X-rayed on account of the cost, and they frequently tell the doctor that "as he has treated so many cases successfully there is no doubt that he can treat this one in the same way." I strongly advise the doctor to get a statement from the patients that they will not be X-rayed, and to throw up the case if they refuse such a written statement.

A woman fell downstairs and hit her shoulder on the banister. She sustained a partial backward dislocation of the shoulder—the head of the bone was lying

on the posterior margin of the glenoid cavity. The case was X-rayed on two occasions, and the report given was, "No bony injury and no dislocation." Why? Because the only views taken were antero-posterior. When in this position the deformity would not show. As it is impossible to get a satisfactory lateral view in this position, a stereoscopic photograph was clearly indicated.

The disability that may follow any fracture is more likely to be the result of bruising of the soft parts, and consequent adhesions, wasting of muscles from enforced rest, and swelling of the limb from loss of tone in the vessels, than of any slight shortening or deformity of the bone, provided there is proper union. It behoves us, therefore, to make it absolutely clear to the patient, the patient's friends, and the general public, that the result of any fracture cannot be guaranteed. No medical man should promise a good result, but say that he will do his best to get a good result, and he should carry out a treatment that is recognized as suitable for that particular case.

It would not be correct treatment in a case of fracture with displacement of both bones of the leg to put it up on a short splint which does not control either ankle or knee-joints.

The injury should be X-rayed as soon as possible, and then the fracture set (either with or without an anæsthetic—just lately some cases have been reported when local anæsthesia has been used to set the fracture. I personally have no experience of this, and do not like infiltrating the already bruised tissues), and put up in the new good position, with suitable splints or extension. In many cases of fracture round the ankle-joint, and of both bones of the lower part of the leg, it is advisable to perform tenotomy of the tendo Achillis. This often enables the bones to be got into good position, and it prevents the pulling upwards and backwards of the foot and lower fragment.

A fresh X-ray photo should be taken in the splint; if the result be good, of course leave well alone, but if the bones have

slipped apart, then a fresh attempt at reduction should be made, followed by a fresh X-ray photo. If the position of the fragment still proves unsatisfactory, the question of operation must be seriously considered.

It is a wise plan to have a new X-ray photo taken at the end of a week or so, to make sure that the bones have not slipped. X-ray photos of fractures should be taken in two directions, as exact alignment may be present in one plane and overlapping of fragments in the other.

It is equally important to X-ray injuries to bones and joints of a doubtful character, as this often reveals a crack in the bone with no displacement. In such cases the periosteum round the bone is often not entirely severed, and enough remains to hold the bones in position for a time, but unless the fracture is held in position until union has taken place, this periosteum may give way at any moment with disastrous results.

This is especially seen in fractures of the neck of the femur in old people, and in any doubtful injury to the hip, extension should be applied and maintained, even if the X-rays show what appears to be an impacted fracture.

A man fell on his left hip, and complained of pain and inability to walk. No physical signs except some slight pain on movement at the hip-joint were found. He was put to bed, and for three days the physical signs remained the same. On the fourth day the leg was found in bed completely everted, with $1\frac{1}{2}$ in. shortening.

A similar type of fracture is often seen with direct injury to the patella and olecranon, and the treatment in the extended position at absolute rest is equally important.

We learn from X-rays that it is impossible to lay down a fixed rule for the treatment of any fracture, as the position of the fragments varies so considerably. An instance of this occurs when there is a fracture of the surgical neck of the humerus, and the head

of the bone is rotated outwards, while the upper end of the lower fragment is in the axilla. This requires treating in the abducted position with the patient in bed, on extension with a weight and pulley, or a modified Thomas's arm-splint.

According to the surgical textbooks, there are three recognized treatments of fractures:—

(1) By means of splints and rest after reduction followed by massage in two or three weeks' time. This is the most usual method and gives very satisfactory results in ordinary cases.

(2) The second is the "ambulatory treatment," where as little splinting as possible is used, and massage is started immediately, the patient being allowed to go about as usual after three days, but with a controlling apparatus. This method requires most expert massage and manipulative treatment, and there is no doubt that unskilled massage may do more harm than good. Light rubbing in the early stages is a great comfort to the patient, but it should never be adopted unless it can be done without moving the splint. In my experience movement of the fragments does not assist the healing of a fracture.

(3) The third treatment is by open operation. This is indicated when it is impossible to maintain the bones in position by other means, and has the enormous advantage of removing the blood-clot that is infiltrating all the neighbouring tissues. In transverse fractures, the bones when fitted together will often remain in good position without any help, but in other cases the fragments must be held together by means of plates, wires, or screws. Unfortunately, all these are apt to behave as foreign bodies, and sinuses leading down to them may form, especially when they are covered only by cutaneous tissue, for example, tibia, olecranon and patella. For this reason I usually recommend the patient to have them removed when union has taken place. In the case of the patella however, I leave them

in unless a sinus actually forms, as there is so much danger of the bone giving way again.

The great danger in operative treatment is sepsis, as this is much more liable to occur while there is injury to the soft parts and bruising of the skin. The bone most commonly operated upon is the tibia, and, although the operation seems easy because the bone is so near the skin, this very fact increases the risk of injury to the skin and the liability to sepsis. The after-treatment of the case is the same as the first, or ordinary method, except that provision must be made for the dressing of the wound.

The treatment of compound fractures follows the same lines, except that it is very important to purify the skin around as well as the wound.

If the bones go into perfect position and the opening is only a small one, it can be treated as a simple fracture, except for the necessary dressing. If the bones do not come into position, then an immediate operation can be carried out and the bones plated or wired as necessary. Sufficient drainage must be allowed for and the whole of the inside of the wound thoroughly purified.

According to the statistics of some cases treated over a number of years, those that were operated upon immediately appeared to be more likely to become septic than the cases that could be purified and covered up and treated as a simple fracture.

I take it that the reason for this is that the wound in the skin is nearly always very much larger in the cases that require operation, and there is much more likelihood of sepsis having already entered.

There are three uncommon complications which are occasionally met with. The first is delayed union, or "soft union," when the bone, though apparently quite firm, bends when the patient begins to use it after the full time for uniting has been allowed. In cases of fracture of the femur I do not allow

the patients to walk under ten weeks at the earliest, usually three months, and then only when an X-ray photograph shows plenty of bony callus.

The second complication occurs when the injury to the bone affects the periosteum more than the bone itself. It nearly always comes on from direct injury, and is called *myositis ossificans traumatica*. This is due to the osteoblasts growing in the tissues outside the bone and producing a hard, tender, bony swelling. This is usually misdiagnosed as sarcoma, but in every case that I have seen severe massage had been carried out almost immediately after the injury, and directly the massage was stopped and the patient put at rest the swelling commenced to subside, though some bony thickening always remained.

The third complication is Volkmann's ischæmic contracture. This is nearly always seen in the fore-arm, and is due to hæmorrhage in the tissues combined with too tight splinting, or flexion of the elbow-joint producing stagnation in the blood-supply.

The pathological condition finally produced appears to be fibrosis of the muscles, nerves and vessels. It may recover with continuous treatment by massage and electricity, though it often takes two or three years, and in some cases is permanent.

EDITORIAL NOTES.

THE Royal Institute of Public Health is holding its Whitsuntide Congress at Zurich from May 15 to 20, 1929. An attractive programme has been arranged. After the Congress, arrangements have been made to visit large numbers of interesting places in Switzerland, Austria and Germany. Many of the Spas in Czechoslovakia are included in the itinerary and also a visit to Dr. Rollier's clinic at Leysin.

The Institute is also arranging a Christmas-