SURGICAL PROCEDURES IN GENERAL PRACTICE

The series of articles under this heading, now resumed, was interrupted in April of this year to make room for a special series on War Wounds and Air Raid Casualties, concluded in our last issue.

FRACTURES OF THE NECK OF THE FEMUR

BY

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Fractures of the neck of the femur are divided into two groups—intracapsular fractures of the neck proper and fractures involving the trochanters. Extracapsular fractures through the base of the neck belong, from a practical point of view, to the trochanteric group. The two groups are widely different as regards both prognosis and treatment.

Intracapsular Fractures

These fractures are seen principally in the elderly, although they may occur at any age. The blood supply of the neck of the femur is never very good, and with advancing years there are often porotic changes that seriously weaken the structure of the bone; it is then liable to fracture with minimum trauma. The fracture is usually close to the head, but it may be at an intermediate position in the neck. A common history is for the patient to trip and fall when walking about the house—there is no need for any more serious accident. The actual fracture may even occur before the patient falls, as from the jar of stubbing the toes; the fall is then the result of the fracture, not the cause of it.

Signs and Symptoms

The fractures are classified into two groups—adduction and abduction. The distinction is of importance, because the former are never impacted, whereas the latter usually are; the prognosis and treatment are therefore entirely different.

Adduction fractures (Fig. 1, left) comprise at least three-quarters of the total number. There is a great

FIG. 1.—Intracapsular fractures. Left: Adduction fracture with upward displacement and internal rotation. Right: Abduction fracture with impaction.

deal of pain, and the patient is often left lying where he has fallen until the doctor arrives. The typical position of the leg is one of adduction and external rotation; the latter may be so marked that the outer border of the foot is lying flat on the floor. There is shortening of the limb, which is partly apparent, due to the adduction, and partly real. Real shortening is caused by upward displacement of the main fragment and may amount to anything between one-half and three inches. There is tenderness on pressure over the great trochanter and in Scarpa's triangle, and pain on jarring the heel. Active movements are impossible and passive movements painful.

Abduction fractures (Fig. 1, right) occur in about one-quarter of the cases. The pain is much less severe, and it is not at all uncommon for the patient to be able to get up, and even to bear weight, immediately after the fall. As there is almost always impaction of the fragments the limb does not assume the classical position described above. It usually lies with the foot straight or internally rotated, and the real shortening is not more than one inch. There is some pain and tenderness in the inguinal region. Active and passive movements may be possible over a limited range without causing very severe pain. Passive movements must, however, be examined with care for fear of disimpacting the fragments, and for the same reason no attempt must be made to elicit crepitus.

Diagnosis

The diagnosis in a classical case is immediately apparent from the history and the position of the limb. However, when there is not much displacement of the fragments, or when they are impacted, it may be difficult to be certain of the nature of the injury. It is unwise to move the patient too much for the purpose of making elaborate measurements of the bony landmarks because of the danger of causing further displacement. Nor should the patient be told to "try the leg out and see how you get on." Radiological examination must be made in every case in which there is the slightest element of doubt—that is, where an elderly person has had a fall causing pain in the hip. The interpretation of the radiographs may be difficult when the fracture is impacted; therefore films of good quality and in both antero-posterior and lateral planes are required. If first-class portable equipment is not available the patient should be sent to hospital by ambulance. To overlook the fracture may be a major tragedy for which the doctor might possibly be held responsible.

Prognosis

Impacted abduction fractures seldom give much trouble, but an adduction fracture is one of the most serious accidents that can befall an elderly person. In the past it was associated with a very high mortality, and even under modern conditions the death rate is higher than that in most other simple fractures. The patient is often already debilitated, there is some shock, the pain is severe and prevents the patient sitting up, and death ensues from pulmonary and cardiac complications. The risk is greatly diminished if the fracture is reduced at the earliest possible moment, so that he can sit up and move about a little without pain. If the patient survives—and at least 90 per cent. should do so—the prospect as regards the ultimate restoration of function is good. In the great majority of cases it is possible to obtain sound bony union by operative methods.

Treatment

Abduction Fractures.—The fragments are impacted and no attempt should ever be made to improve the position. The principal indication is to avoid disimpaction and ensure that no weight is carried on the leg until there is firm union. Many people have walked with these fractures from the start without coming to any harm, but they are

taking a serious risk. The patient is put to bed without any retentive apparatus. Some movement is possible, and he can be propped up at once in the Fowler position to reduce the risk of pulmonary trouble. There is, however, no need to keep him in this position all the time; he can lie down at night, and it is an advantage for him to turn on to the sound side. Later he can be lifted into an arm-chair and taken out of doors in a wheel-chair. After ten to fourteen days the pain diminishes greatly and active movements are begun. Local massage assists in getting rid of any bruising, and general massage is helpful in maintaining the patient's condition. After six weeks a weight-bearing calliper is fitted; it is worn for about eight weeks, until the radiographs show good consolidation of the fracture. The earlier use of a calliper entails more risk because of the difficulty in ensuring that it carries the weight properly. The instrument is hard to fit, especially in fat people. The best type has a "bucket top" in place of the more usual ring; it is made of moulded leather, and laces in front to allow of easy adjustment. The bucket fits under the ischial tuberosity, from which the weight is transmitted down the side bars of the instrument in the shoe. The heel should not touch the shoe, and it carries no weight at all. It is advisable to check personally the fitting of a calliper. This can be done by slipping a finger into the patient's shoe under his heel; he should then be able to transfer his whole weight to the calliper without hurting the finger.

Adduction Fractures.—Treatment cannot be undertaken in a private house unless there is adequate provision of trained nurses and equipment. The great majority have to be transferred to hospital; the sooner this can be done the better the prognosis. Moving the patient on to a stretcher and carrying him downstairs may cause a great deal of pain. Attempts at splinting of any sort are nearly as painful, and are best omitted. The most satisfactory procedure is to give an intravenous anaesthetic, which should last long enough for the patient's transfer to the ambulance; it can, if necessary, be repeated during the journey.

SMITH-PETERSEN NAIL

Nearly every other form of treatment has been superseded by the use of the Smith-Petersen triradiate nail. The operation has a greater significance than setting a fracture usually implies; it is a life-saving measure. Once the fracture is fixed, the patient is free from pain, is able to move and to sit up, and the dangers of prolonged immobilization are removed. It is not a particularly dangerous procedure; there is little operative shock, and age alone is not a contraindication. The operative mortality is so low that it can safely be said that the chance of survival of any but a moribund case is greater with operation than without it.

The methods of introducing a Smith-Petersen nail and individual variations in technique are so numerous that description of detail is of little value. In general, the procedure can be divided into two stages: first, reducing the fracture; secondly, introducing the nail. Reduction at open operation is now almost universally abandoned in favour of "closed" methods. Some surgeons perform the reduction by manipulation on the operating table immediately before inserting the nail. Others do it by traction while the patient is still in bed. The limb is placed in a Thomas splint suspended from a Balkan beam, and traction is applied by a weight (10 to 15 lb.) attached by adhesive strapping. The reduction is controlled by radiographs, and when the position is satisfactory the nail is inserted without removing the extension.

After-treatment also varies greatly with the surgeon. It is, however, becoming more widely appreciated that weight-bearing before consolidation of the fracture is unsafe—too many cases have occurred in which the pin has broken or become displaced. My own practice is to keep the patient in bed for six weeks. After two weeks, massage is begun and active movements of flexion and extension of the hip are encouraged, but rotation is avoided because the leverage may be great enough to dislodge the nail. It is advisable to wear in bed a shoe with a twelve-inch ruler fixed transversely to the heel to prevent external rotation by the weight of the limb. After six weeks the patient is allowed up in a weight-bearing calliper, which is worn until there is satisfactory radiographic evidence of consolidation. The pin may have to be removed at a later date, but it is not essential to do so unless it starts to extrude itself.

OTHER METHODS

Other methods of treatment may be required in the rare case in which the patient is unfit for operation or in which operation is refused. The choice then lies between fixing the limb in a long plaster-of-Paris spica extending from toes to nipple line (Whitman) and continuous weight traction as used for trochanteric fractures. In both cases radiographic control of reduction is essential. A successful result may be expected in 40 to 50 per cent. of cases.

Ununited Fractures

Non-union may be encountered when operative treatment has been impossible or has been neglected, or when displacement has recurred after operation. A satisfactory functional result is often obtained by osteotomy (McMurray). The femur is divided obliquely below the great trochanter and the distal fragment displaced inwards below the head. A plaster-of-Paris spica is applied and kept on for about three months, by which time union between all three fragments should have occurred. If operation is impossible there is no alternative to the permanent use of a weight-bearing calliper.

TROCHANTERIC FRACTURES

These fractures may occur at any age, but more usually in middle age or later, as the result of direct violence applied to the great trochanter or a rotation strain, or both together. There are two main types: (1) Fractures through the base of the neck or obliquely through the adjacent part of the great trochanter. The lesser trochanter may also be detached. The displacement is seldom pronounced, but there may be external rotation which opens up the gap between the fragments (Fig. 2, left and centre). (2) Comminuted fractures in which the neck seems to have been driven through the great trochanter. There is usually considerable displacement and marked coxa vara (Fig. 2, right).

FIG. 2.—Trochanteric fractures. Left: Type 1, fracture through base of neck, without displacement. Centre: Type 1, fracture through great trochanter, with external rotation and detachment of lesser trochanter. Right: Type 2, comminuted fracture.

Diagnosis

On examination there is pain and tenderness over the great trochanter, but the pain tends to be less severe than with intracapsular fractures. There may be external rotation of the limb, and in the second type there is real shortening. The diagnosis is made on radiological examination. Either stereoscopic films or a lateral view is advisable, because in fat people the great trochanter may have fallen into a plane posterior to the neck and yet appear to be perfectly positioned in a flat antero-posterior film.

Treatment

TYPE 1

If there is excessive rotation the displacement is reduced under anaesthesia. Internal rotation is the only movement required; care must be taken not to exert too much traction or to abduct widely, or coxa valga may result. The reduction is controlled radiologically, and then a plaster-of-Paris spica is applied. For the application of the plaster the patient is placed on an orthopaedic table or, if that is not available, on a pelvic rest. In the latter case the shoulders are raised on a platform to the height of the pelvis in order to prevent lordosis. The feet are held by two assistants with the legs slightly abducted and flexed at the hips; about 10 degrees of flexion and eighteen inches separation of the feet are sufficient. The affected hip is kept in internal rotation and the knee of that side flexed 45 degrees. The line joining the antero-superior spines must be perpendicular to the median plane of the body. The bony points are well padded with felt, or the whole area to be included in the plaster may be covered with a layer of wool secured by a cotton bandage. A well-fitting plaster is then applied, extending from the costal margin to the tips of the toes. The sound leg is not included. The plaster must be worn for at least twelve weeks. If weight-bearing is started too soon the neck of the femur may bend at the site of fracture, causing coxa vara. An active patient may be able to get about on crutches after the first week or two.

An alternative method of treatment is the insertion of a short ($2\frac{1}{2}$ to 3 inch) Smith-Petersen nail. The operation is easy in experienced hands and does not require any elaborate control of direction. The hip is then protected by a short plaster spica stopping above the knee, and weight-bearing may be begun after a few days. The plaster should not be discarded for about eight weeks.

TYPE 2

The fracture requires reduction because of the varus deformity. The most satisfactory method is by continuous skeletal traction. A Smith-Petersen nail cannot be used because of the comminution. Traction is conveniently applied by means of a Kirschner's wire through the femur; the leg rests in a counterbalanced Thomas splint in a position of full abduction and internal rotation.

The leg is first placed on a Thomas splint of a suitable size; the ring should be large enough not to cause pressure and yet not so large as to get in the way. Strips of flannel bandage four inches wide are folded round the bars and beneath the leg and secured by large safety-pins or paper clips to the outer bar. The splint is then suspended from a Balkan beam, preferably by four cords, one from each corner of the splint. The cords are passed round pulleys and carried to the head of the bed, and weights are attached to counterbalance the weight of the limb. Loose shot in canisters provide a convenient method of varying the weight, which is so adjusted that when the patient

moves—for example, to sit up or to use the bed-pan—the splint and limb move with him without effort. The foot is supported at right angles by a foot-piece attached to the splint or by a strip of adhesive plaster on the sole leading to another cord ending in a 1-lb. weight. The foot of the bed is placed on nine-inch blocks so that the patient's weight will provide countertraction.

When the splint is in position a Kirschner's wire is inserted. This can be done under local anaesthesia: an area about one inch in diameter on each side of the leg is freely infiltrated with novocain down to and including the periosteum. The wire is inserted well clear of the knee-joint and its suprapatellar pouch—that is, about two inches above the adductor tubercle. The stirrup is applied and the wire strained as tightly as possible to prevent bending; it should give a very high-pitched note when struck. The cord for traction is attached to the stirrup and passed over a pulley on the lower upright of the Balkan beam.

It is advisable to start traction with a considerable weight, say 25 to 30 lb., so that reduction is effected rapidly. Radiographs are taken after twenty-four hours, and if the position is satisfactory the weight is reduced to 10 lb. A heavy weight must not be used for long without x-ray control or it will produce coxa valga. The fragment consisting of the lesser trochanter does not return to its proper position; it joins by fibrous union and does not cause any subsequent trouble. After a week a knee-flexion iron is attached to the Thomas splint in such a position that the hinges are in the plane of the knee-joint. The flannel strips are transferred to this iron and another cord and weight are provided to counterbalance it. Movements of the knee are made at least once daily under supervision; it is possible to obtain, with assistance, at least 90 degrees of flexion. Traction is maintained for twelve weeks or until firm consolidation is shown radiologically—if the weight is removed too soon the varus deformity is liable to recur. With a heavy patient it is advisable to use a weight-bearing calliper for another six to eight weeks.

TUBERCULOSIS IN WAR TIME DEPUTATION TO MINISTER OF HEALTH

The Minister of Health, Dr. Walter Elliot, on October 27 outlined to a deputation representing the National Association for the Prevention of Tuberculosis, the Joint Tuberculosis Council, and the Tuberculosis Association, at which representatives of the Society of Medical Officers of Health and the London County Council were also present, the steps which had been taken to ensure that tuberculous persons continue to receive treatment while keeping an adequate reserve of beds for air raid casualties.

War-time Accommodation

Dr. Elliot said he was having the greatest difficulty in persuading people that hospital services were available now just as before the outbreak of war. In particular it had always been intended that the anti-tuberculosis services should be maintained in war time. Although some patients had been discharged from sanatoria and other institutions to allow of accommodation for casualties, about two-thirds of the 28,000 beds provided for the treatment of tuberculosis in England and Wales remained available throughout the early weeks of the war for their peace-time purpose, though naturally this proportion varied in different parts of the country. If through some misunderstanding actively infectious cases had been discharged they should be sought out and brought back for treatment.