EMERGENCIES IN GENERAL PRACTICE

FEMORAL NECK FRACTURES AND SHOULDER DISLOCATIONS

BY

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FRACTURES OF NECK OF FEMUR

Fractures may occur anywhere in the neck of the femur, but it is usual to classify them according to definite levels. This is helpful from the point of view of both treatment and prognosis. Thus they may be subcapital (Fig. 1), transcervical (Fig. 2), or basal. The last may be intertrochanteric (Fig. 3) or pertrochanteric (Fig. 4). In addition, the subcapital fractures are subdivided into the abduction type, which is impacted (Fig. 5), and the adduction type, which is more common and is not impacted (Fig. 1).

Age Incidence and Mode of Injury

These fractures nearly always occur in patients past "middle age," but it should be remembered that they can occur at any age, even in the first decade of life. In younger people the fracture is usually transcervical and the injury necessary to produce such a fracture is a violent one, falling from a bicycle being a common cause. The basal fractures, too, at any age, require a fairly violent injury and there is often a history of a heavy fall. It is well known, however, that in the aged the injury necessary to cause a subcapital or transcervical fracture may be very trivial and may consist of such a simple accident as tripping over a mat, slipping off a kerbstone, or even a sudden twist of the body with the foot fixed on the ground. The actual mechanism seems to be an external rotation strain of the shaft of the femur on the head. If, in addition, the leg is forced into abduction, an impacted fracture will probably result. If there is no such abduction, or if there is an adduction strain, the resulting fracture is not impacted.

Clinical Picture

Impacted (Abduction) Fractures.—In this type of injury the clinical signs may be few. The limb lies in the neutral position and signs of trauma may be entirely absent. Active rotational movements of the limb are usually possible, and indeed movements may be full, with a little pain only at the extreme limits. Some of these patients may have been taking weight on the leg since the injury, with little or no discomfort. There may, however, be slight or even moderate tenderness around the hip-joint and in particular over the front of the head and neck of the femur in Scarpa's triangle. Active and passive movements of the hip may be restricted and there may be spasm of the muscles around the joint. It cannot be too strongly emphasized that any patient past

middle age who complains of even slight pain in the region of the hip after any injury, however trivial, should be suspected of having a fracture of the neck of the femur until this is proved otherwise by radiographs.

Unimpacted (Adduction) Fractures (Subcapital and Transcervical).—These fractures lie within the capsule of the hip-joint, and this usually limits the amount of external rotational deformity of the limb to about 40–50 degrees. Tenderness is severe over the head and neck of the femur and pain occurs on all movements of the hip, which are restricted and accompanied by spasm of the surrounding muscles. Active rotational movements of the limb are not possible and the patient is unable to correct the external rotation deformity.

Basal Fractures.—These fractures occur outside the capsule of the joint and the limb rolls into 90 degrees of external rotation until the outer border of the foot lies flat on the bed. The tenderness is centred over the greater trochanter and lateral part of the neck of the femur. All movements are painful and accompanied by muscle spasm.

Radiographs.—Antero-posterior and lateral radiographs should be taken to confirm the presence of a fracture and to determine its level. In the impacted abduction type the fracture line will be much more oblique than the almost vertical line of the unimpacted adduction fracture. In addition, of course, there will be no separation of the bone ends in the former type.

Treatment

Patients with unimpacted fractures should be admitted to hospital. This should be insisted upon, as treatment at home is unsatisfactory. On the other hand, if the fragments are firmly impacted, home facilities suitable, and the patient would be unduly disturbed by admission, such cases can well be treated in their homes.

The limb must be made as comfortable as possible for transport to hospital. This is best achieved by immobilization on a Thomas splint. As an alternative a long Liston splint may be used. In the absence of these appliances a reasonable degree of fixation may be obtained by bandaging the injured leg to the sound limb.

Impacted (Abduction) Fractures

Provided the fracture remains impacted it will unite even without treatment. Some of these fractures, however, become disimpacted, and this has led many surgeons to treat this type of injury routinely by the insertion of a Smith-Petersen trifin nail. Others feel, as we do, that a more

FIG. 1.—Subcapital fracture of neck of femur (adduction type). FIG. 2.—Transcervical fracture. FIG. 3.—Basal (intertrochanteric) fracture. FIG. 4.—Basal (pertrochanteric) fracture. FIG. 5.—Subcapital impacted fracture of neck (abduction type).

conservative line is justified, particularly in the older patients. To guard against accidental external rotational strains, which may disimpact the fracture, the patient should be treated in bed, wearing a slipper with a cross-bar of wood nailed to the heel. To prevent stiffness, active knee and hip movements must be encouraged; they may be started within a few days. Weight bearing can be recommenced in six to eight weeks.

Unimpacted (Adduction) Fractures

In most centres the routine treatment for this type of fracture is reduction and internal fixation by a Smith-Petersen trifin nail inserted with radiographical control. The patient may be allowed to sit out of bed within a few hours of operation, to reduce the risk of chest complications. Active movements of the knee and hip should be started after the first few days, external rotational strains being avoided. Union of the fracture takes a variable time and it is not easy to decide how soon weight-bearing can be begun. Clinical signs of union are, of course, present from the time of operation, provided the fracture is held firmly by the nail, but radiographs may be difficult to assess. If there are no complications the patient is usually allowed to start weight-bearing at about 14 to 16 weeks after reduction.

In some patients the blood supply of the head of the femur is cut off by the injury and an avascular necrosis develops. This is particularly apt to occur in subcapital fractures in the elderly, and in such cases the nail will cut out of the head of the femur and the fracture will not unite. The relatively high incidence of this complication among the elderly has led to a trial of arthroplasty as the primary method of treatment. The head of the femur is removed and replaced by an acrylic or metal prosthesis. Unfortunately the results of such operations are unpredictable and the onset of severe

pain in the hip within 18 to 24 months is a common occurrence. This is usually due to the prosthesis working loose or breaking. In most centres the Smith-Petersen nail is still regarded as the best method of primary treatment. The management of avascular necrosis—and the resultant failure to unite—remains an unsolved problem. A secondary operation is usually necessary, the choice lying between displacement osteotomy of the McMurray type and excision of the head and neck of the femur. Arthroplasty has been tried but is as likely to fail as when used for recent fractures. Arthrodesis is made difficult by the poor quality of the bone in the avascular femoral head.

In a child fracture of the neck of the femur is usually transcervical and can be satisfactorily treated in a plaster-of-Paris hip spica. Avascular necrosis is a common complication, but the fracture usually unites if immobilization is uninterrupted. The head slowly becomes revascularized over a period of one to two years. During this time the

FIG. 8.—Hippocratic manœuvre.

FIG. 6.—Dislocation of right shoulder.

FIG. 9.—Post-reduction splinting.

FIG. 7.—Kocher manœuvre: (a) and (b) elbow held firmly at right angles while arm is slowly rotated outwards to overcome spasm of subscapularis muscle; (c) elbow now moved across towards midline to bring head of humerus from subcoracoid position; (d) hand brought across chest so that internal rotation rolls the humeral head back into the glenoid cavity.

hip must be protected from all weight-bearing. The development of painful osteoarthritis some years later is a very strong probability.

Basal Fractures

Two methods of treating basal fractures are almost equally successful. Conservative treatment with skin or skeletal traction on a Thomas splint in abduction saves the elderly patient from an operation, usually results in union of the fracture (but often with some degree of residual coxa vara), but has the disadvantage of keeping the patient in bed for between three and four months.

Operative treatment consists in reduction of the fracture and fixation with a nail-plate driven into the neck and screwed to the upper femoral shaft. After-treatment is similar to that when a Smith-Petersen nail is used for a subcapital or transcervical fracture. Elderly patients stand this operation well and can be mobilized early. Comminution of the distal fragment which is sometimes found in pertrochanteric fractures may be a contraindication to operation, as it may make the fixation of the plate to the shaft of the femur difficult or impossible. After both conservative and operative treatment the patient is allowed to start weight-bearing in about three to four months.

Prognosis

If treatment is undertaken early the mortality in fractures of the neck of the femur is now quite low. Basal fractures nearly all unite and are followed by very little disability. Avascular necrosis in subcapital fractures in the elderly is still a very great problem and results in much disability, but, provided this complication does not arise, the results of the Smith-Petersen nailing operation are good and function afterwards is usually excellent.

DISLOCATIONS OF THE SHOULDER-JOINT

The shoulder-joint has a wide range of movement, and to permit this the glenoid fossa is shallow and the capsule relatively loose. Stability is normally maintained mainly by the powerful surrounding muscles. It is this lack of depth of the glenoid and laxity of the capsule which make the shoulder the commonest joint to be dislocated.

Formerly it was thought that the mechanism of this injury was a violent abduction of the arm, which allowed the head of the humerus to escape from the glenoid inferiorly where the capsule is loosest. It is probable, however, that this is a rare mechanism. More commonly the head of the humerus is driven out anteriorly with tearing of the capsule or fibrous labrum. This results either from a direct blow on the back of the shoulder or from a fall on the outstretched hand with the arm partially abducted and extended. The head of the humerus comes to lie below the coracoid process (subcoracoid dislocation), but on occasions may be forced further medially (subclavicular) or even driven through the chest wall.

Posterior dislocation, with the head of the humerus lying in the infraspinous fossa, is rare but important, for the diagnosis is often missed.

Clinical Picture

When seen soon after the injury the shoulder appears flattened and there is a hollow below the prominent acromion (Fig. 6). The line of the upper arm carries the elbow away from the side, and this should make the diagnosis obvious, even when later swelling has obliterated the flattened appearance of the shoulder itself. The head of the humerus can be felt in an abnormal position, there is well-marked tenderness, and all movements are restricted. These patients should all be examined for vascular and nervous lesions. Damage to the axillary artery is rare, but injury to the circumflex nerve or brachial plexus is much more common. Paralysis of the deltoid should always be

looked for; it may be the result of a circumflex nerve palsy or injury to the posterior cord or upper trunk of the brachial plexus. It is not necessary for the arm to be moved in order to test the motor power of the deltoid. Contractions can be detected by palpating the muscle, and the patient is told to attempt abduction of the arm while the elbow is firmly held by the examiner's hand.

Many nerve lesions which in the past have been attributed to the manipulations of reduction have in fact almost certainly resulted from the initial injury. This may be of medico-legal importance, so every patient should be examined for nerve lesions *before* reduction of the dislocation is attempted. Radiographs of the shoulder should be taken to confirm the diagnosis and, of greater importance, to exclude a concomitant fracture of the neck of the humerus. Such a fracture, without dislocation, can usually be diagnosed on clinical grounds alone, but if it occurs as a complication of a dislocation diagnosis is more difficult. In these days of plentiful facilities, therefore, radiographs should always be taken before reduction, and only if this would mean a delay of many hours is it permissible to attempt reduction without this precaution. An unwise manipulation on the rugby field, for example, may disimpact an impacted fracture of the neck of the humerus and convert a relatively simple injury into a very difficult problem.

Treatment

As a first-aid measure the arm should be placed in a large arm-sling; it may be more comfortable if bound to the side. Only if radiographic facilities are not fairly readily available should reduction be attempted by one of the methods detailed below. In the absence of knowledge about the state of the neck of the humerus, the straight pull of the Hippocratic method may be less dangerous than the torsional strain of Kocher's manoeuvre. The manipulation should be stopped at once if a feeling of crepitus is encountered.

Most shoulder dislocations can be reduced without anaesthesia with relatively little discomfort to the patient if the injury is recent. Anaesthesia, particularly with a relaxant, does, however, make the reduction a great deal easier.

Kocher's Method of Reduction (Fig. 7).—The patient lies in the supine position. While traction is maintained with one hand on the elbow the arm is slowly externally rotated with the other hand. Several minutes must be taken over this, the most important part of the manipulation, in order to stretch the subscapularis muscle as far as possible. The elbow is then carried across the chest, while maintaining the full external rotation. Finally, the arm is internally rotated. The whole manoeuvre should be carried out gently and smoothly. It is often impossible to say at which stage the head of the humerus slides back into the glenoid.

Hippocratic Method (Fig. 8).—The patient lies supine and traction is applied to the externally rotated arm, counter traction being provided by the pressure of the unbooted foot placed in the axilla. Most of the pressure with this foot is in fact against the chest wall, and, although this method is reputed to have caused nerve lesions, most of these were probably produced by the injury and not looked for before manipulation. After traction for several minutes the head of the humerus is gently levered into the glenoid fossa, using the unbooted foot as the fulcrum.

After-Treatment

The reduction should be confirmed by clinical examination and by radiographs. As soon as possible after reduction the integrity of the supraspinatus must be tested by active abduction of the shoulder. If the supraspinatus is ruptured the arm should be immobilized in abduction and forward flexion in a plaster spica or abduction frame. If supraspinatus function is normal the arm should be bandaged across the chest with a pad of wool in the axilla and the wrist supported in a collar-and-cuff sling (Fig. 9).

The elbow must be included in the bandage, to prevent both downward subluxation of the head of the humerus and also external rotation of the arm. This position is maintained for three weeks, during which time wrist and finger exercises must be practised.

At the end of three weeks, active movements of the shoulder and elbow are begun. It may take several weeks or months before full function is restored. Manipulation of the shoulder should be avoided at this stage, as it almost invariably retards progress. Provided active exercises are carried out many times a day, a full range of movement will be regained.

If the three-weeks period of immobilization is omitted and active exercises are started immediately a more rapid return of function can be achieved. There is, however, a very real danger of recurrent dislocation of the shoulder after such treatment. Almost every patient with a recurrent dislocation of the shoulder has a history of an initial dislocation which was never immobilized. For this reason it is justifiable, even in elderly patients, to accept the rather slower restoration of full function which follows three weeks of immobilization.

Photographs and diagrams by Mr. R. F. Ruddick, of the photographic department of the London Hospital.

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TREATMENT OF HIGH BLOOD PRESSURE

A SYMPOSIUM ON HYPOTENSIVE DRUGS

[FROM A SPECIAL CORRESPONDENT]

A symposium on the chemistry, pharmacology, and clinical applications of hypotensive drugs, arranged by the Biological Council, was held on April 5 and 6 at the Wellcome Building, London. The meeting was opened by Sir CHARLES HARRINGTON, F.R.S.

Improved Prognosis in Malignant Hypertension

The clinical session was opened by Professor J. McMICHAEL (London), who surveyed the results of five years' treatment with the ganglion-blocking agents of patients with malignant hypertension. He said that he had long abandoned the oral use of these drugs, in view of their irregular absorption. They were now given almost exclusively by injection, and treatment was supplemented by small doses of reserpine which were ineffective by themselves. The ganglion-blocking drug favoured at the moment was pentolinium, the side-effects of which were minimized by giving a large dose at night and a small dose in the morning. The five-year survival rate was particularly gratifying. Of 73 patients with Grade IV malignant hypertension (Keith-Wagener classification) some 50% were still alive after that period. Untreated, most of them would not have survived for 2½ years. The prognosis was particularly good if the blood urea was not above 60 mg./100 ml. Under treatment with ganglion-blocking agents the retinitis cleared up within a few weeks, although papilloedema might take up to nearly a year to disappear. The typical morning headache, heart failure, and cardiac murmurs vanished. Too much could not be expected of treatment, however, and the gross cerebrovascular and renal complications could not be halted, nor could the risks of thrombosis and haemorrhage be averted. There was a distinct danger of pushing treatment too far, as it might then precipitate angina and cardiac infarction. Professor McMichael said that tolerance to

pentolinium occurred; the dose had to be increased from time to time in patients kept on the drug for long periods. It was true that only one case of hypertension in about 200 became malignant, but he thought that it might be worth while carrying out a "prophylactic trial" with the hypotensive drugs in patients with non-malignant hypertension to see if this figure could be reduced.

Professor F. SMIRK (Dunedin, New Zealand) described the treatment carried out in his hypertension clinic. Patients attended it all day long for five days a week initially, and they were taught to give their own injections; blood pressures were taken every half-hour by trained personnel. With the blood pressure under control the patients came two days a week, then one day a week, and finally occasionally by appointment. During the last five years 16,000 all-day tests had been done. Professor Smirk liked to keep the systolic blood pressure within the limits of 110 and 140 mm. Hg (measured standing), and he took full advantage of the standing or sitting posture. Patients were not allowed to recline; even in bed they slept sitting up, or else the bed was put on blocks. For treatment he supplemented pentolinium with small doses of rauwolfia alkaloids, such as reserpine, rescinnamine, or canescine, which were given in doses of from 0.5 to 1 mg. daily. "Ecolid" and mecamlamine were still under trial. Professor Smirk said that the survival rate at the end of six years in the Grade IV malignant group was nearly 60%. This compared favourably with the figure of 2% in untreated patients. His overall six-year survival figure for all types of malignant hypertension among a group of 320 was 75%.

The Swedish survival figures given by Dr. B. HOOD (Gothenburg) were even more encouraging. In a small series of 66 patients with Grade III and IV hypertension the survival rate after 5½ years was 83%. In a comparable untreated group the corresponding figure was 10% after a year. Since the study started Dr. Hood had treated 900 patients with ganglion-blocking agents, the action of which was supplemented by small doses of one of the rauwolfia alkaloids, such as reserpine, and also with hydrallazine. He claimed that drug treatment, which was superior to sympathectomy, had enabled him to get many people back to a healthy life and even back to work. Over two-thirds of the survivors with malignant hypertension were now back in full-time employment. Professor C. BARTORELLI (Milan) described his experience of hexamethonium and reserpine in hypertension. With ecolid the blood-flow to the lower limbs as opposed to that to the upper limbs was much increased.

Warning Against Indiscriminate Medication

The indiscriminate administration of hypotensive drugs to patients who are not suffering from malignant hypertension was deprecated by Dr. G. PERERA (New York), who said that he used them only in cases with cardiac, renal, and retinal complications. They should never be used in patients who were asymptomatic. Dr. Perera said that the lives of many patients with asymptomatic hypertension were being made miserable by the administration of potent hypotensive drugs. When he did use them they were employed alone, not in combination, so that the action of each drug could be correctly assessed. The rauwolfia alkaloids sometimes produced mental depression and rarely brought about an adequate fall of pressure in patients needing drug therapy. The veratrum alkaloids were also of little value, because they had to be given in doses that produced nausea and vomiting before they had an appreciable effect on the blood pressure. Dr. Perera had found that hydrallazine alone had no significant hypotensive effect. He did grant, however, that the more potent ganglion-blocking agents bring down the blood pressure, produce symptomatic improvement, clear the disks, and relieve congestive heart failure. They did this more effectively and consistently than other drugs, but in his view the results obtained were no better than those following sympathectomy. Their side-effects militated against their use except in the unusually co-operative type of patient with advanced disease.