THE TREATMENT OF SUB-CAPITAL FRACTURES OF THE NECK OF THE FEMUR

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Abduction fractures of the femoral neck with a horizontal fracture line and impaction present no problem. The fracture may, however, disimpact with an external rotation force, so the patient should be kept in bed wearing a slipper fitted with an external rotation stop, or should partial-weight-bear for at least two months. Alternatively, the fracture may be held by a trifin nail; this is the ideal, for the fractures are then stable to compression and rotation forces and no further protection is needed. Adduction fractures present an entirely different problem, and the treatment is operative, using one of three methods: Simple internal fixation with a trifin nail, complicated devices or methods of internal fixation, or replacement arthroplasty.

Aims of Treatment

The essential of any method of treatment is to enable the patient to become mobile as soon as possible, thereby minimising the risks of remaining in bed; bed sores, bronchopneumonia and senile dementia are common with methods of treatment which involve bed rest. An excellent X-ray result is of no value if the patient dies of the complications of bed rest, or requires admission to a mental hospital.

The treatment of the bone is dominated by the fear of non-union and the possibility of avascularity of the femoral head. The younger the patient the more likely is avascular necrosis. Accurate reduction and fixation of the fracture are necessary to prevent synovial fluid infiltrating the fracture line and inhibiting callus formation, giving rise to non-union.

The good results of operations in which the femoral head is retained are better then those following prosthetic replacement, but in displaced adduction fractures the good results are only slightly more common than the bad ones.

Simple Pin Fixation

A trifin nail will hold a subcapital fracture adequately, providing the posterior cortex of the neck is not unduly comminuted. Accurate reduction is essential, and is much easier to achieve with the help of an X-ray image intensification unit. This unit also reduces the operating time considerably (to less than ten minutes), which is an advantage in the elderly patient. The nail must be accurately placed in the head of the femur to resist the forces acting on the fracture: external rotation when lying in bed, and a shearing force when weight bearing. The more head there is in front of the pin the more it resists external rotation forces; the lower the pin is placed in the head the less likely it is to break out through the top of the head with weight bearing. The ideal pin therefore is situated low in the neck resting on the calcar femorale, and low and posterior in the head. The simple trifin nail is easily inserted with little disturbance to the patient, and should be firm enough to allow the patient to get out of bed the day after operation.

The disadvantages of simple pin fixation are (1) if the fracture impacts after operation, the pin is extruded laterally, losing its hold in the cortex of the shaft, (2) a badly placed pin may cut out of the head with weight-bearing, and it must be accepted that the elderly may not be able to manage or even understand partial weight-bearing, (3) a pin may cause segmental avascular necrosis of the head; to counteract this possibility Moore's pins have been used in place of a trifin nail, but have been found to be insufficiently strong to withstand weight bearing stresses.

Other Devices and Methods of Internal Fixation

Because of general dissatisfaction with the 25% failure rate following simple pinning, many devices and methods have been developed during the last few years. Nail-plates with a stronger grip on the lateral femoral cortex will prevent the nail from backing out, but if the fracture impacts the nail will protrude into the hip joint. Sliding devices which allow for impaction at the fracture still have the disadvantage that they may have a poor hold on the head, and these devices need quite a major operation for their insertion. Crossed screw fixation, using coarse threaded screws, grip both fragments more securely and are less likely to allow the fracture to fall apart, but the insertion of such screws is a major procedure for which many patients are not fit.

Replacement Prosthesis

There is no doubt that in the displaced fracture in elderly patients replacement arthroplasty allows the earliest return to normal ambulation. The operation, done by the posterior approach, is quick and simple; moreover, the patient may be got up and allowed to take full weight within one or two days of the operation. Replacement arthroplasty restores stability and near normality to the joint, and the patient feels more stable on the hip than if it had been pinned. The disadvantage of this operation is that there is a small percentage which dislocate, and there is
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no salvage operation other than conversion to an unstable excision pseudarthrosis.

Summary

The aims of operation are to restore stable hip function, and to ensure early mobility for the elderly patient. For the impacted abduction fracture a simple trifin nail is the treatment of choice. For the adduction type of fracture without much comminution of the neck, simple pinning is likely to give a good result. Where there is much comminution of the neck the age and general condition of the patient determine the choice of treatment. The younger patient can withstand a major operation, and should not be subjected to a procedure with no possibility of satisfactory salvage; consequently one of the more complicated internal fixation operations is indicated. If there should be failure the patient is likely to be fit enough for a subsequent replacement operation. In the senile patient, particularly if the fracture line is very vertical or the fracture has occurred some days prior to treatment, replacement with a prosthesis is the treatment of choice.

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