TROCHANTERIC FRACTURES OF THE FEMUR

A Review of Eighty Cases with a Description of the "Low-nail" Method of Internal Fixation

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From recent papers on trochanteric fractures of the femur it appears that internal fixation is being advocated increasingly often (Aronsson 1947, Cleveland et al. 1947, Newell 1947, Hammond and Cady 1948, Lamphier et al. 1948, Evans 1949, Boyd and Griffin 1949). Some surgeons, on the other hand, still prefer conservative treatment (Murray and Frew 1949), and it is true that trochanteric fractures, unlike fractures of the femoral neck, unite easily and that internal fixation is not necessary to obtain bony union. Traction, with some devices such as a plaster boot and flanged heel-plate to prevent rotation, will usually permit union in good position within about fourteen weeks.

The present writer considers that operative treatment has definite advantages over conservative methods; and it is the purpose of this paper to emphasise, in particular, the merits of the "low-nail" method of internal fixation described by Brittain in 1942 and advocated by Burns and Young (1944). The operation is simpler in principle and, in our experience, easier and quicker to perform than other methods.

Classification—The conventional classification of trochanteric fractures into pertrochanteric and intertrochanteric fractures is not very useful in treatment. A more practical division is into the three following types: Type 1—Fractures with minimal displacement and without cortical overlap. The lesser trochanter is often avulsed (Fig. 1). Type 2—Fractures with displacement and some comminution, and usually with cortical overlap. This is the commonest type (Fig. 2). Type 3—Grossly comminuted fractures—too comminuted for internal fixation by any method (Fig. 3).
THE ADVANTAGES OF OPERATIVE TREATMENT

In considering the arguments for or against operation many factors have to be taken into account.

**Mortality**—Many writers have found that mortality figures favour the operative method. For instance Cleveland et al. (1947), in whose series the death rate after operation was 12.6 per cent, reported a mortality from conservative treatment as high as 34 per cent. Comparable mortality figures after operation can be obtained only by including all patients, however treated, who did not leave hospital alive. In our series of eighty cases the mortality from conservative treatment (thirty-four cases) was 15 per cent and that from operative treatment (forty-six cases) 20 per cent. Most of the deaths, however, occurred many months after the accident and from causes not related to it; for many patients remained in hospital long after they were fit for discharge because of domestic difficulties. The mortality attributable directly to the operation was very low; if all deaths occurring two months or more after operation are excluded the mortality rate was only 7 per cent, while that from conservative treatment was 12 per cent. Our series is admittedly small, and all we can say is that in our experience considerations of mortality do not significantly favour either operative or non-operative treatment.

**Morbidity. Joint stiffness**—In our experience hip and knee movement has been better in cases treated by internal fixation than after conservative treatment. Restoration of full joint mobility is important, especially in the younger patients.

**Mental deterioration**—Stress has been laid on the severe senile mental deterioration which is said to be more common in the patients treated conservatively. Although we found slight mental upset and transitory disorientation common in these cases, severe mental upsets were rare, and the type of treatment adopted did not alter its incidence in our cases. *Associated*
diseases—Incontinence of urine or an upper motor neurone lesion causing spasticity makes conservative treatment difficult, and such patients are better treated by internal fixation.

Other factors—There are two other factors which weigh heavily in favour of operation. The first of these has not always received the emphasis it deserves. Three months or more in bed with limb traction is a great ordeal for old patients. They are much happier with the freedom of movement that adequate internal fixation affords. They are able, with assistance, to sit in a chair within a few days of the operation, and can begin to walk on crutches as soon as they have regained muscular control of the limb—usually within two weeks of the operation. None of our patients treated conservatively was able to walk on the limb sooner than fourteen weeks after injury; whereas the average time before weight-bearing was allowed in patients treated with the "low-nail" method of internal fixation was eight weeks.

The second additional factor is that the period in hospital is much less with the operative method; in our series the average stay in hospital was eighteen weeks with conservative treatment, and nine weeks with operative treatment. We believe that if one has available a method of treatment which will give these benefits without increasing the mortality or morbidity rates then it should be the method of choice. For these reasons we use internal fixation in preference to conservative treatment whenever possible.

**PRINCIPLES AND TECHNIQUE OF OPERATION**

A trifin nail is inserted obliquely upwards and medially along the medullary cavity of the upper end of the shaft of the femur, through the neck and into the head (Fig. 4). A nail five or six inches long is usually required. Placed in this way it gives firm fixation of the fracture, gripping the bone at three points—in the cortex of the shaft, the calcar femorale of the neck, and the cortex of the head. The mechanical principles involved are sound (Fig. 4),
for the tendency to redisplacement of the fracture is in the direction of coxa vara deformity, and the low nail straddles the fracture line as a strut which effectively resists angulation.

**Operative technique**—The technique is essentially the same as that for nailing transcervical fractures, except that the nail enters the shaft fragment lower than usual and is directed more obliquely upwards. After reducing the fracture by traction on an orthopaedic table we use a \(-\) shaped notched guide (fixed to the skin surface anteriorly) with radiographic control to determine the correct direction of the guide wire and its point of entry. Because of the obliquity of the nail it is also necessary to gouge a groove in the cortex of the femoral shaft, to receive the head of the nail; otherwise the cortex may split above the point of insertion of the nail when it is hammered in. Illustrative radiographs are shown in Figures 5 and 6.

**Advantages of the "low-nail" technique**—Because of the very firm fixation afforded by this method the patient may be allowed to take weight on the limb earlier than after fixation with a nail-plate, which has a point of weakness at the junction of the nail with the plate. In our series the average time before weight-bearing was eight weeks with the low nail and thirteen weeks with the nail-plate. Moreover the low nail is quicker to insert and involves less trauma to the patient than does the nail-plate. Its only disadvantage is that in comminuted fractures difficulty is sometimes encountered in directing the guide wire across the fracture line into the femoral neck. In a few cases the fracture has been considered unsuitable for "low-nail" fixation and a nail-plate has been used instead.

**SUMMARY**

1. The advantages of internal fixation of trochanteric fractures of the femur are discussed.
2. It is suggested that a long oblique trifin nail driven across the fracture affords more rigid fixation than a nail-plate and facilitates earlier weight-bearing.

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**REFERENCES**


