INTERNAL FIXATION OF THE McMURRAY OSTEOOTOMY
WITH A TRIFIN NAIL*

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This paper is not concerned with the merits of the McMurray osteotomy; anyone who
gives the operation a fair trial will find it an excellent way of stabilising a weak or painful
hip. As usually practised (McMurray 1935), the operation has the disadvantage that it
necessitates immobilisation in a plaster spica for several weeks. In order to avoid this, and
to allow early activity, various forms of internal fixation have been used. Most of these
consist of some form of modified “blade plate” which is screwed to the femoral shaft. They
all have disadvantages. The length and the extent of the operation are increased, and fixing
the plate to the femur tends to reduce the medial displacement of the shaft—indeed, if the
displacement is adequate, access to the femoral shaft is usually a difficult matter. The
“blade plate” must be adjustable in two dimensions to allow for varying degrees of hip
deformity and, if it has to be removed at a later date, this too may be a major procedure.

If the osteotomy is made sufficiently high—as indeed it must be to ensure permanent
relief of pain—the upper end of the lower fragment consists mainly of cancellous bone and,
like cancellous bone elsewhere, can be fixed with a trifin nail, driven from the greater trochanter
into the upper end of the shaft (Fig. 1). This method of fixation is quick and relatively easy;
it requires no special instruments and can be adapted to any degree of hip deformity. It also
allows minor adjustments of position in the postoperative period and the pin can, if
necessary, be removed easily at a later date.

TECHNIQUE OF OPERATION

It is important that the osteotomy should be really high and the shaft well displaced
under the femoral head. In this position it is locked against the side of the pelvis and a trifin
nail can be driven through both cortices of the shaft to secure good fixation. If the osteotomy
is too low, it may be difficult to fix the pin securely in the lower fragment.

The writer prefers an angled incision beginning midway between the anterior superior
iliac spine and the postero-superior angle of the greater trochanter, extending behind the
trochanter and then turning distally to end about four inches down the leg. The skin flap
is reflected forwards and the interval between the gluteus minimus and the tensor fasciae
latae [femoris] is defined and opened. Three bone levers are then inserted round the upper
and lower borders of the femoral neck and the lateral aspect of the shaft respectively. The
anterior surface of the intertrochanteric region is displayed and the site of osteotomy can be
chosen with precision. By starting the osteotomy medially it is easy to avoid the formation
of a spike running up into the neck, which may otherwise occur with a high osteotomy. After
the femur has been divided the shaft is displaced medially under the head of the femur and
for this part of the operation it is a great advantage to have a third assistant to hold the limb
in the correct position. A guide wire is now inserted half to three-quarters of an inch below the
tip of the greater trochanter and is passed obliquely downwards and medially into the lower
fragment under direct vision. It may be necessary to make a small drill-hole in the lateral
cortex of the shaft to allow the guide wire to enter the bone. The guide is introduced until
it is felt to engage against the medial cortex. The position of the guide wire is preferably

checked radiographically; and a suitable trifin nail is driven along the guide wire until it penetrates the medial cortex of the shaft. The guide wire is removed, the firmness of the fixation is tested by the assistant manipulating the leg, the wound is closed and a firm pressure bandage is applied.

**Postoperative care**—The necessity for splinting after operation depends on three factors: the efficiency of the internal fixation, the mobility of the hip and the degree of pre-existing deformity. Under favourable circumstances—for example in a fairly recent fracture of the neck of the femur—it is possible to leave the limb completely free; but usually some external support is wise, especially if the hip is stiff and deformed or if the bone is very soft. Double below-knee plasters joined by a wooden bar to hold the legs slightly abducted and in neutral rotation are a convenient method, but other methods such as Russell traction can be used just as successfully. Both methods allow the patient to sit up and to lie down, to move his knees and to exercise his quadriceps, gluteal, abdominal and respiratory muscles. After about five weeks a single above-knee plaster spica is applied and the patient is allowed up. The spica is retained for a further four to five weeks.

**Causes of failure**—The causes of failure are entirely technical. They include: making the osteotomy too low; failing to displace the shaft adequately; failing to use a long enough nail; inserting the nail too low in the trochanter or obtaining an inadequate fixation of the lower fragment; and finally omitting external splinting in difficult cases. All these mistakes can and should be avoided; they are mentioned because they have been made and there is no need for them to be repeated.

**SUMMARY**

Internal fixation with a trifin nail after displacement osteotomy of the femur permits reduction of external splintage to a degree that any patient can tolerate with ease; it also eliminates the problem of the stiff knee.

The method has been used successfully for recent and old fractures of the femoral neck, for post-irradiation fractures, for failed nailing operations or arthroplasties, for osteoarthritis, for rheumatoid arthritis, for old congenital dislocations and subluxations, and to stabilise the hip after excision of the head and neck to create a pseudarthrosis.

**REFERENCE**