administration, and no cases of deep or superficial infection.

Discussion. We previously reported bone and fat levels some 12 times higher than those after systemic injection (Hoddinott et al 1990) and have now extended our sampling to provide a pharmacokinetic profile over the important 24 hours after operation (Fig. 1). The results indicate that the regional intravenous administration of a single 750 mg dose of cefuroxime gave satisfactory haematoma levels for at least 20 hours in all our patients. The main reservoir for the antibiotic during this period is the bone, and bone levels are therefore probably higher than the haematoma level.

Our results suggest that a single dose of cefuroxime is adequate for postoperative prophylaxis, dispensing with the need for further systemic injections. Our numbers are too small to allow us to comment on infection rates, but it does seem logical to provide the maximum available antibiotic level at the operation site during the surgical procedure.

We recommend the use of the regional intravenous injection of a single dose of prophylactic antibiotic for knee arthroplasty performed under tourniquet.

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REFERENCES


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AN EXTENDED TROCHANTERIC OSTEOTOMY FOR REVISION TOTAL HIP REPLACEMENT

PAUL C. PETERS JR., WILLIAM C. HEAD, ROGER H. EMERSON JR

There are now only rare indications for an osteotomy of the greater trochanter in primary total hip replacement, but some revisions necessitate the better access which it provides. The complications of trochanteric osteotomy include nonunion, fibrous union, chronic bursitis and broken wires. For revision cases, osteoporosis, osteolyis, and the lack of a suitable bed for the trochanter make reattachment more difficult. Various techniques of wire fixation and wire mesh reinforcement have been used, but the same complications continue to occur (Amstutz, Mai and Schmidt 1984; Kavanagh, Ildstrup and Fitzgerald 1985; Pellicci et al 1985; Schutzer and Harris 1988).

We describe an extended trochanteric osteotomy which allows for wider exposure and access, the adjustment of trochanteric position and abductor tension, and improved bone apposition.

Materials and methods. From 1988 to 1991, we performed 169 revision total hip arthroplasties using a trochanteric osteotomy. Of these, 21 had an extended trochanteric osteotomy. There were 13 men and eight women; ten had had more than one previous replacement and 15 had had a previous trochanteric osteotomy, all of which had united. All required increased exposure for major allografting and reconstruction of the acetabulum.

Surgical technique. For exposure, we use either a modified anterolateral extensile approach (Head et al 1987) or a trochanteric slide (Glassman, Engh and Bobyn 1987). The proximal femur is exposed and the trochanteric

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osteotomy is started posteriorly and medially to the tip of the trochanter. A reciprocating saw continues the osteotomy inferiorly about 3 to 10 cm distal to the vastus tubercle and a horizontal osteotomy is made at this level. The soft tissues are retracted anteriorly and the anterior limb of the osteotomy continues proximally from the horizontal cut. The trochanteric fragment then includes one-quarter to one-third of the circumference of the femur (Fig. 1). An osteotome may be needed to complete the cut. The trochanter is elevated, retaining its gluteus medius and minimus muscle attachments. After capsulectomy, there is an excellent exposure of the acetabulum.

At the end of the operation, the trochanteric fragment can be positioned at the desired level, and the tongue of cortex fixed in this position with horizontal cerclage wires and by the fixation provided by the femoral prosthesis. If the tongue of bone is porotic, it can be reinforced and captured by a cortical allograft strut to provide more secure fixation (Fig. 2a).

Weight-bearing after operation depends on the stability and fixation of the acetabular and femoral components. If this is poor, casts or braces are used, but assisted abduction and flexion exercises are begun soon after the operation and abductor rehabilitation is gradually increased. Walking aids are discarded when the trochanteric osteotomy is radiographically united and when abductor strength has sufficiently recovered.

**Results.** All 21 extended trochanteric osteotomies united. Four showed delayed healing but had united by six months. In the nine patients who had allograft struts to capture the trochanteric fragment, radiographic union was not certain until junctional healing of the strut was apparent at an average of 12 months postoperatively (Fig. 2b). There were no cases of broken wires, and no trochanteric migration. One patient had recurrent dislocation of the involved hip, but this was successfully treated by repositioning of the acetabular implant.

**Discussion.** Trochanteric osteotomy for revision hip arthroplasty facilitates exposure but has associated complications. Osteoporosis, osteolysis, an inadequate bed for trochanteric reattachment, and the need for adjustment of leg length all give problems (Amstutz et al 1984; Kavanagh et al 1985; Pellecchi et al 1985).

Our trochanteric osteotomy helps exposure and facilitates reattachment. A distal trochanteric osteotomy which facilitates preservation of the trochanteric fragment when a cementless prosthesis has drifted laterally has been described by Cameron (1991) but all our extended osteotomies were performed for revision of cemented prostheses. The long bone incision facilitates the removal of cement from the femur as well as improving access to the acetabulum.

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