

IATROGENIC Z-DEFORMITY OF THE PROXIMAL FEMUR
IN AN OSTEOARTHRITIC HIP
SUBTROCHANTERIC OSTEOTOMY
WITH INTRAMEDULLARY FIXATION FOR ARTHROPLASTY OF THE HIP
A CASE REPORT

E. C. R. MERCHAN, E. GALINDO

Hip osteoarthritis in its final stage may require arthroplasty. Sometimes an extreme Z-deformity of the proximal femur is present, if a previous valgus trochanteric osteotomy has been performed. To correct a Z-deformity of the proximal femur during total hip arthroplasty, a subtrochanteric corrective osteotomy was performed in a 52 year-old woman. Intramedullary fixation of the osteotomy was secured using a standard long-stem isoelastic femoral component alone.

Keywords: osteoarthritis; hip; Z-deformity; proximal femur; osteotomy; arthroplasty.

Mots-clés : coxarthrose; hanche; déformation en Z; extrémité supérieure du fémur; ostéotomie; arthroplastie.

INTRODUCTION

We describe a method of correcting an extreme iatrogenic deformity of the proximal femur during total arthroplasty of an end-stage osteoarthritic hip in which a previous intertrochanteric osteotomy had been performed.

Subtrochanteric osteotomy has been used by Lazanski during cup arthroplasty for congenital dislocation of the hip (1) and by Sponsoller and McBeath during total hip arthroplasty for arthroplasty of the dysplastic hip (2). Subtrochanteric osteotomy has been reported to maintain bone stock, improve prosthesis containment, and maintain continuity of the trochanter ad shaft (2). We

performed the osteotomy as a part of an isoelastic total hip arthroplasty, and we used the standard long-stem prosthesis for intramedullary fixation.

CASE REPORT

A 52 year-old woman sought treatment for an osteoarthritic left hip with severe degeneration. She had had a trochanteric osteotomy of her left hip in another centre 12 years ago because of severe pain in her left groin.

No clinical report on this previous operation was available to us. Partial relief of pain was obtained for 10 years with the operation. On clinical examination her left leg was 1 cm longer than her right leg and she had a marked Trendelenburg sign. She had had hip pain when walking or standing for the previous 2 years. The flexion arc before operation was 80°; the pre-operative rotation arc was 25°; abduction before operation was 15°. Plain radiographs showed the presence of a Borja-Araujo blade-plate on her left proximal femur; radiographic findings indicated advanced osteoarthritis associated with an extreme Z-deformity of the proximal femur (fig. 1).

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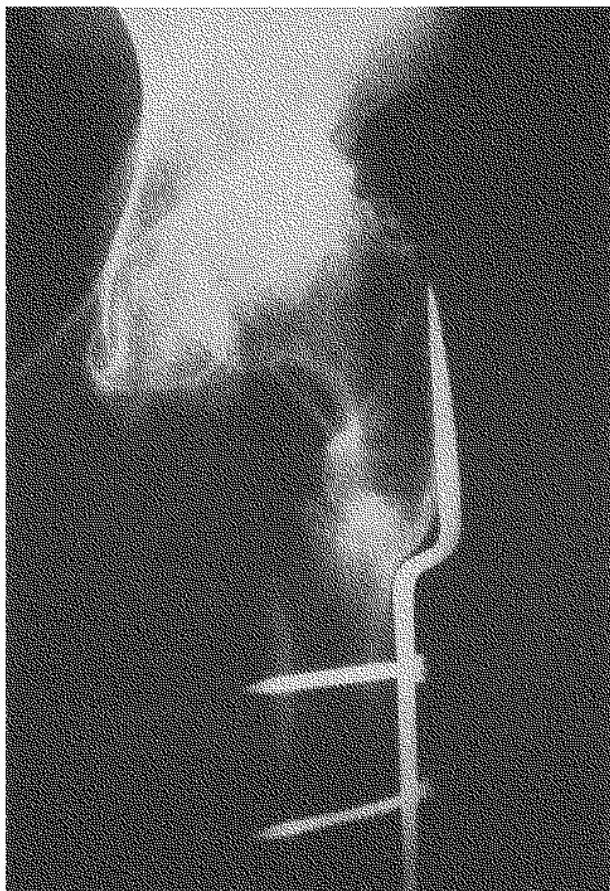


Fig. 1. — Anteroposterior view of the pelvis before removal of the existing plate and screws. The severe Z-deformity can be observed.

Taking into account such radiographic findings, we deduced that a valgus osteotomy had been performed in the previous operation.

It was decided to remove the existing blade-plate in order to leave the femur free to undergo as a second procedure, a total hip arthroplasty with a subtrochanteric osteotomy. The removal of the screws presented no unusual problems although special instrumentation for broken screws was required.

Postoperative radiographs provided a better view of the extreme Z-deformity of the proximal end of the femur (fig. 2).



Fig. 2. — Postoperative views : (A) Anteroposterior view ; (B) Lateral view. Extreme Z-deformity on the proximal femur can now be better seen after the removal of the plate and screws.

Six months later, total hip arthroplasty was carried out, with the deformity corrected through a horizontal subtrochanteric osteotomy. A standard long-stem isoelastic prosthesis was used. This long-stem femoral component had the following principal characteristics : the proximal third of the stem has circumferential crosshatchings, and the lower two-thirds is quadrilaterally grooved in a longitudinal fashion ; a reinforcing steel core is required in the plastic (polyacetal resin) to match its stiffness. A snap-fit 32-mm steel-head neck unit allows for length adjustments (28-34-40-44 mm), and the unit is easily changed for proper intra-operative adjustments.

The surgical approach was lateral according to Hardinge (3). A mark was made on the femoral shaft to indicate the original relationship of the fragments before the osteotomy. The femoral

osteotomy was made below the lesser trochanter. The proximal femoral segment was stabilized using bone-holding clamps while reaming was carried out.

The fit of the prosthesis was tested in each segment separately, until contact began to occur at the same relative depth in both. The femoral head was resected at the usual level. The entire osteotomized proximal femur could be retracted for acetabular exposure, in the same manner as for an osteotomized greater trochanter. The prosthesis was inserted into the canal of first the proximal, then the distal femur, with the deformity corrected by holding both fragments with bone forceps. The precise canal fit and femoral stem fixation was achieved, but a transfixing screw provided additional stability (fig. 3). Acetabular insertion presented no unusual problems.

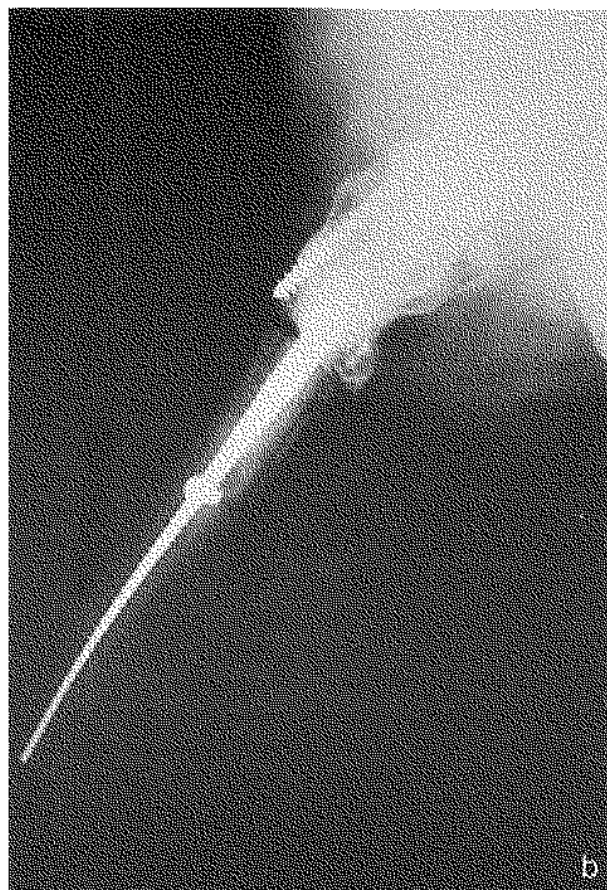


Fig. 3. — Postoperative anteroposterior (A) and lateral (B) views after total hip arthroplasty. The osteotomy site (long-arrow) and the transfixing screw (short-arrow) can be seen.

The flexion arc after the implantation of the prosthesis was 100° ; the rotation arc was 60° ; postoperative abduction was 30° .

After surgery, weight bearing was limited using crutches for 6 months. The patient eventually achieved full weight bearing by 10 months. She did not have any significant groin pain. She has been followed for more than 4 years and is doing well without pain (fig. 4). She returned to light housework 10 months after surgery.

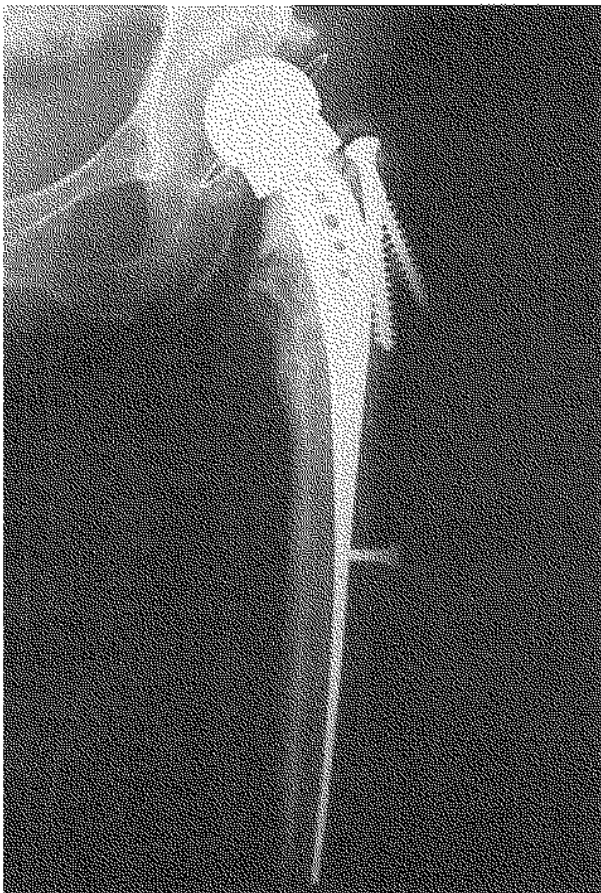


Fig. 4. — Anteroposterior view 4 years after arthroplasty, showing union of the osteotomy.

DISCUSSION

The aim of any arthroplasty is to produce a freely mobile, painfree, stable and durable result. Many different techniques have been tried in

arthroplasty of the hip, but total hip arthroplasty was revolutionized by Charnley (4) with the introduction of acrylic bone cement. In 1967, Robert Mathys anticipated that the bone-cement bond was susceptible to gradual weakening and began developing a cementless prosthesis.

Some reports have shown excellent short-term results of isoelastic total hip arthroplasty, although this prosthesis needs a longer follow-up evaluation to prove its effectiveness (5, 6).

On the other hand, subtrochanteric osteotomy with intramedullary stem fixation is presented for consideration in the management of excessive iatrogenic Z-deformity of the proximal femur during total hip arthroplasty after previous trochanteric osteotomy.

Subtrochanteric osteotomy offers maximal bone preservation and does not require additional incision or hardware. The acetabular exposure is as generous as with trochanteric osteotomy.

Care must be taken not to split the proximal fragment when inserting the femoral stem, yet the medullary fit must be tight to control rotation.

The isoelastic stem allows the femoral stem to be partially stabilized with a transfixing screw at the level of the midstem, in order to increase the intrinsic femoral stem stability.

CONCLUSION

When an osteoarthritic hip in its final stage requires arthroplasty, and a severe Z-deformity of the proximal femur caused by previous valgus trochanteric osteotomy is present, a subtrochanteric osteotomy may allow intramedullary fixation of the osteotomy. Fixation was secured in this case during a standard long-stem isoelastic femoral component alone.

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SAMENVATTING

E. C. R. MERCHAN, E. GALINDO. Z-vormige misvorming van het proximale uiteinde van het femur bij coxarthrose. Combinatie van een totale arthroplastiek met subtrochantaire correctieve osteotomie.

De plaatsing van een totaalprothese wegens geëvolueerde coxarthrose, kan bemoeilijkt worden door een Z-misvorming van het proximale femur, secundair aan een vroegere intertrochantaire osteotomie. Om de Z-mis-

vorming tijdens de arthroplastiek te corrigeren, werd een subtrochantaire osteotomie uitgevoerd bij een 52-jarige patiënte. De stabilisatie van de osteotomie gebeurde d.m.v. de lange centro-medullaire steel van een isoëlastische componenten.

RÉSUMÉ

E. C. R. MERCHAN, E. GALINDO. Déformation en Z de l'extrémité proximale du fémur dans une coxarthrose. Arthroplastie de hanche, combinée à une ostéotomie sous-trochantérienne, stabilisée par fixation intramédullaire.

La réalisation d'une arthroplastie de hanche, en fin d'évolution d'une coxarthrose, peut être compliquée par une déformation en Z de l'extrémité supérieure du fémur, suite à une ostéotomie intertrochantérienne, pratiquée antérieurement. Pour la correction de la déformation en Z de l'extrémité proximale du fémur, au cours de l'arthroplastie, une ostéotomie correctrice fut pratiquée chez une malade de 52 ans. La stabilisation de l'ostéotomie fut réalisée à l'aide d'une prothèse fémorale isoélastique à longue tige.