

Total Hip Arthroplasty in Slipped Capital Femoral Epiphysis: A Novel Technique to Remove Embedded Knowles Pins

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ABSTRACT

The Knowles pin has been well recognized in fixing slipped capital femoral epiphysis. When these pins are left in place for a long period, it is very difficult to remove them during total hip arthroplasty, because the pins have fluted threads, which are oversized in the end and allow bone growth in the previously threaded slots.

We present a simple and novel technique to remove Knowles pins so that both unnecessary trauma to the lateral femoral cortex and operating time is reduced significantly.

In situ fixation of slipped capital femoral epiphysis (SCFE) is a common method of treatment.¹ Some of these patients develop arthritis of the hip when they grow older and require a total hip arthroplasty (THA). If the fixation devices are still in situ in the proximal femur, they need to be removed before a THA can be done. Removal of Knowles pins from the proximal

femur is very difficult because these pins do not have a reverse cutting flute, and there may be bone growth in the screw threads.² We describe a novel technique to remove these pins during THA.

“We find that this avoids unnecessary trauma to the outer cortex of the femur and also significantly reduces operating time.”

SURGICAL TECHNIQUE

The hip is exposed through a posterior approach, and the femoral head is dislocated. The neck is then cut with a narrow saw blade at the usual

site for the femoral component of THA, which is usually one finger-breadth above the lesser trochanter (Figure 1). The femoral head fragment is further segmented into 6 pieces in the coronal plane with a saw or sharp osteotome (Figure 2) and into 2 more oblique pieces in the oblique plane with a narrow saw or sharp osteotome (Figure 3). These fragments are then removed piecemeal. The pins are thus exposed and cleared of any bony debris (Figure 4). After the head has been removed, the pins are loosened and hammered retrograde (Figure 5). The rest of the THA is then performed in the usual manner.

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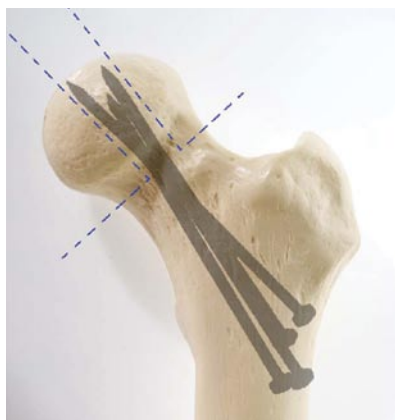


Figure 1. Dotted line shows transverse saw cut across the base of the femoral neck and two oblique cuts.

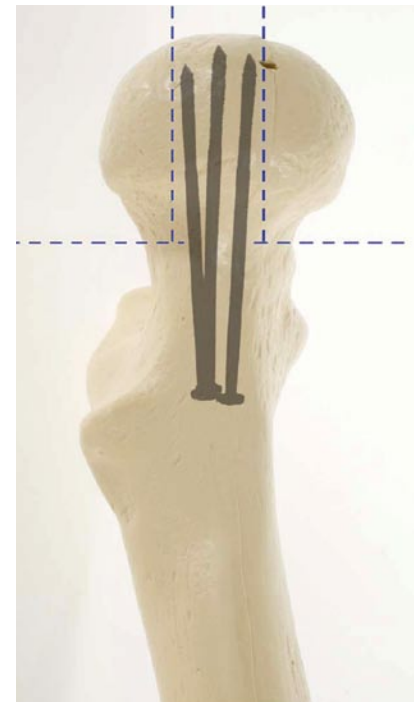


Figure 2. Dotted line shows saw cut in coronal plane and transverse saw cut across the base of the femoral neck.

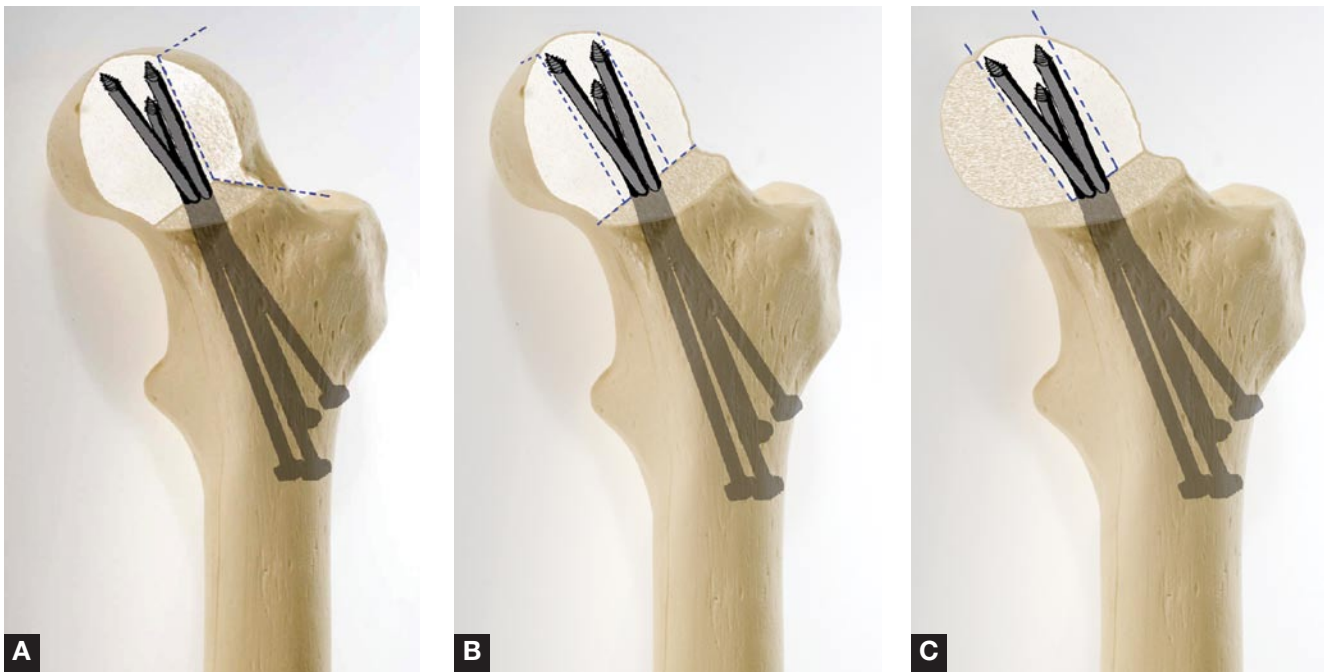


Figure 3. (A, B, C) The femoral head is segmented and removed piecemeal.

DISCUSSION

Many patients who have been treated for SCFE have retained metal implants for long periods of time. When these patients undergo THA, the surgeon encounters much technical difficulty in removing this retained metal work, and the problem of pin retrieval after SCFE is well recognized.³⁻⁶ We have described a novel technique to remove these pins. We find that this avoids unnecessary trauma to the outer cortex of the femur and also significantly reduces operating time.

AUTHORS' DISCLOSURE STATEMENT

The authors report no actual or potential conflict of interest in relation to this article.

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Figure 4. The Knowles pin is exposed.



Figure 5. The Knowles pin is hammered out of proximal femur.