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*TECHNICAL NOTE*

# Cement technique for reducing post-operative bursitis after trochanteric fixation

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**Post-operative trochanteric bursitis is a known complication secondary to the surgical approach in total hip arthroplasty. This phenomenon may be partially attributable to repetitive microtrauma generated when soft tissues rub against implanted hardware. Significant rates of post-operative trochanteric bursitis have been observed following procedures in which a trochanteric fixation device, such as a bolt-washer mechanism or a cable-grip/claw system, is used to secure the trochanteric fragment after trochanteric osteotomy. We present a simple technique for use with a bolt-washer system or grip plate in which trochanteric components are covered in bone wax followed by a layer of cement to decrease friction and to diminish the risk of post-operative bursitis.**

**Keywords** : total hip arthroplasty ; trochanteric bursitis ; trochanteric fixation ; cement.

## INTRODUCTION

Trochanteric bursitis has been observed with high frequency with use of a bolt and washer for stabilization after greater trochanteric osteotomy in total hip arthroplasty (THA) (*2*). This condition is a minor yet painful complication of the surgical approach in THA, for which various potential aetiologies have been postulated. These causes include altered biomechanics, scar tissue formation, and repetitive soft tissue trauma (*3*,*5*). We employ a simple technique that involves coating the bolt and washer screw holes with bone wax and then cementing the washer construct in order to reduce friction across the components. A smoother surface may decrease the incidence of post-operative trochanteric bursitis.

## TECHNIQUE

The hip joint is exposed via a standard arthroplasty approach. Following acetabular exposure and reaming, a trochanteric osteotomy is made. The trochanter is reattached using the bolt and washer attachments that complement the system (Fig. 1 A). Multiple screws are placed to augment the fixation and rotational stability of the reconstruction. A Dall-Miles cable (Stryker, Mahwah, NJ) may also

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***Fig. 1.*** — Intra-operative images showing placement of the trochanteric washer (A), the fixation bolt and washer screw heads coated with bone wax (B), and application of polymethylmethacrylate cement to the greater trochanteric hardware with hand-contouring of the cement interface (C).

be placed for supplemental fixation of the trochanteric osteotomy, although there is theoretical risk of wire breakage and symptoms related to fragmented wiring. The bolt and screw heads are coated with bone wax (Fig. 1B), and cement is then laid over the entire greater trochanteric hardware (Fig. 1C). The bone wax is completely covered and thus contained by the cement. Bone wax is applied to the screw heads prior to the cement in order to facilitate removal of hardware if necessary in the future. The cement layer is hand-contoured to affect a smooth gliding surface for the overlying soft tissues. As the cement cures, the surgeon must take care to create a smooth surface, free of macroscopic irregularities, and to ensure that the high profile of the bolt-washer mechanism is adequately contoured by the overlying cement.

## DISCUSSION

Some recent papers report bursitis rates of approximately 4.5% after primary THA (*3,4*). Vicar *et al* found that this figure increases to 11% when trochanteric osteotomy is added to the procedure (*6*). Chandler *et al* reported that 11 patients in a cohort of 48 patients undergoing revision THA with the S-ROM (DePuy Orthopaedics Inc., Warsaw, IN) femoral component experienced bursitis/tendonitis associated with the use of cables for trochanteric reattachment (*1*). Furthermore, Chilvers *et al* observed trochanteric bursitis at a rate of 31% when the S-ROM bolt-washer mechanism was utilized in concert with the rest of the system (*2*). While the exact pathogenesis of this complication is unknown, it is suggested that repetitive soft tissue microtrauma and scar tissue formation may account for some cases of this condition after THA (*3,5*). When observing the exposed bolt and washer of the S-ROM hip system (Fig. 1B), the damaging effect of this hardware on the surrounding soft tissues is readily appreciated.

We believe that covering the exposed greater trochanteric hardware with a layer of cement (Fig. 1C) helps minimize mechanical friction about the prosthesis by providing a smooth gliding surface about the trochanter. This theoretically decreases soft tissue abrasion and reduces the risk of post-operative trochanteric bursitis. Additionally, coating the bolt and washer with cement potentially protects the surrounding soft tissue from the titanium staining and irritation associated with mechanical fretting described by Chilvers *et al* (*2*). While the initial offending prominence of the hardware remains beneath the cement, the cement offers a broader surface over which surrounding soft tissues can glide. The frictional forces are less concentrated over a particular aspect of the orthopaedic hardware and are instead dispersed over a greater surface

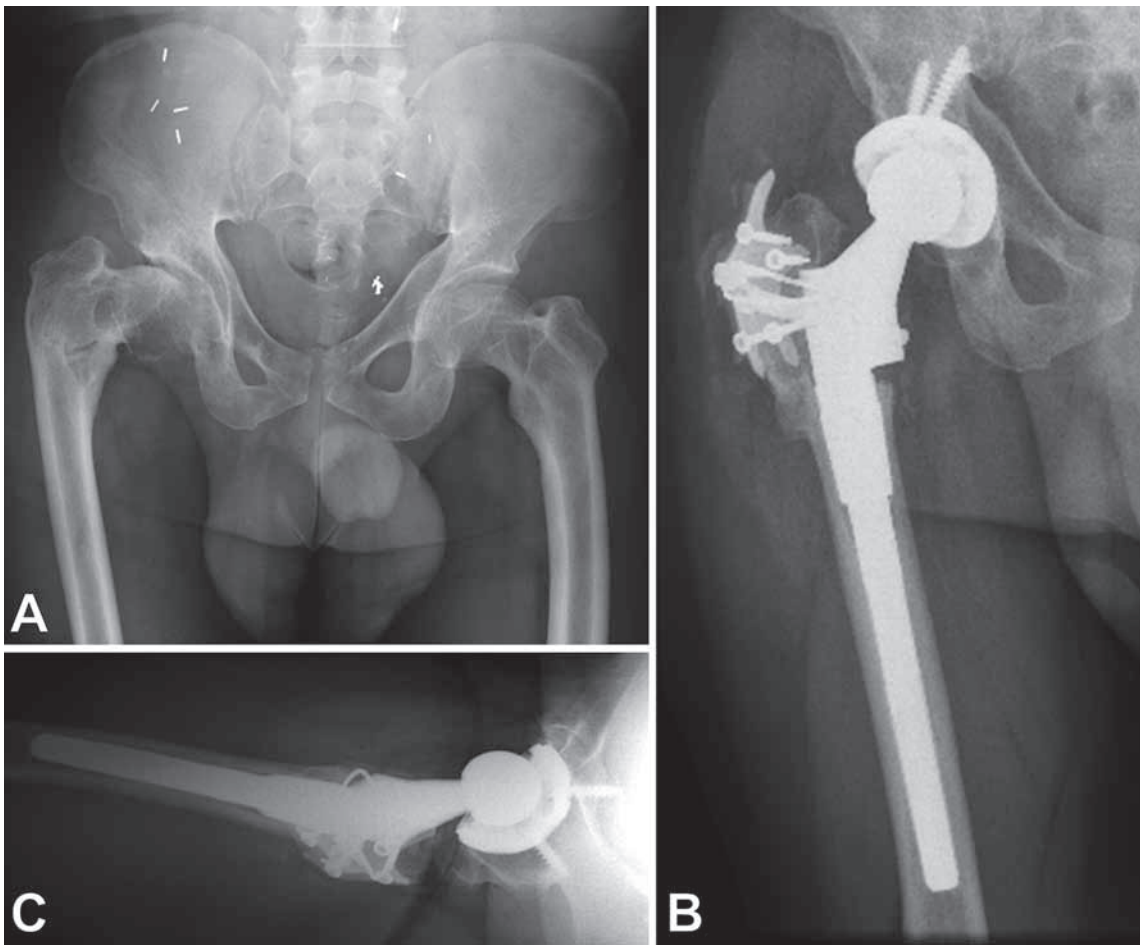


***Fig. 2.*** — Pre-operative anteroposterior radiograph of the pelvis (A) demonstrating severe deformity of the right proximal femur requiring modular prosthesis implantation. Post-operative anteroposterior (B) and lateral (C) radiographs after greater trochanteric and subtrochanteric osteotomies and placement of the modular prosthesis utilizing the cement technique described here.

area. To date, this novel technique has been utilized on five patients, and no instances of trochanteric bursitis or adverse events have been observed. While there is the theoretical concern for foreign body reactions with the use of bone wax, the authors feel that the bone wax is necessary to prevent cement interdigitation into the bolt head and screwing mechanism while the cement hardens. If access to the bolt head is needed at a later time (e.g., to remove the bolt in a revision setting), the bone-wax interface will facilitate extraction.

Previous studies have indicated that the choice of surgical approach to the hip joint can significantly affect the incidence of trochanteric bursitis. The common aetiology may be the splitting of the overlying fascia or abductor tissues directly over the prominences of the greater trochanter. Iorio *et al* found that the use of a posterior approach resulted in a trochanteric bursitis incidence of only 1.2% compared to 4.9% in a direct lateral approach (*4*). The technique we describe here also utilizes a posterior approach with the intention of reducing the formation of scar tissue over the greater trochanter.

In conclusion, the simplicity, minimal financial and operative time costs, and observed clinical suc-

cess of this technique make it an attractive option for minimizing undesirable bursitic complications often associated with trochanteric washer systems. To date, it has been employed exclusively in patients in whom an S-ROM trochanteric bolt-washer device was implanted, but it may be applicable to a wider variety of trochanteric fixation systems to afford a stable, low-friction construct in the setting of primary or revision arthroplasty as well as in trauma.

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