A Simple, Reproducible Method for Centering the Guide-Pin in Hip Resurfacing Arthroplasty

By Jared R. Foran, MD; Scott T. Ball, MD

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With this technique, guide-pin placement and subsequent femoral head preparation can be performed accurately and efficiently without the need for additional instruments, navigation, or imaging.

Hip resurfacing arthroplasty has undergone a recent resurgence in popularity. A number of studies with short- to mid-term follow-up, as well as the Australian Hip Registry, have validated hip resurfacing as a viable alternative to traditional total hip replacement, particularly for younger, more active patients with good bone quality.

One of the drawbacks to the procedure is the greater technical difficulty, which has resulted in a well-described learning curve.7-9. Femoral-sided failures after hip resurfacing are typically multifactorial. It may be related to poor patient selection4,6,10, (eg, poor bone quality, osteoporosis, large cysts). Additionally, poor surgical technique has been implicated. Superior femoral neck notching and component malposition in varus have been associated with increased risk of neck fracture7,8,10.

With most hip resurfacing systems, the initial step of femoral head preparation is placement of a guide-pin down the center of the femoral neck, followed by reaming the path for the short metaphyseal stem of the implant. All subsequent steps of head preparation are performed around a stem guide. Therefore, it is vitally important to the procedure that this initial step is performed with accuracy.

A simple, reproducible method for placement of the guide-pin has been developed. This method requires no additional instrumentation such as a pin-centering guide and no computer-assisted navigation or patient-specific custom molds.

Materials and Methods
One hundred one consecutive hip resurfacing arthroplasties in 84 patients were performed by the senior author (S.T.B.) using the technique described in this article. The senior author recorded the target neck-shaft angle for each case with preoperative templating. To assess the accuracy of the described technique, both authors reviewed the postoperative radiographs and recorded the actual neck-shaft angle achieved at the time of surgery. Additionally, radiographs were scrutinized for notching, cortical violation by the stem, and fractures. The means of the templated target angle and the actual neck-shaft angle of the implant were then compared.

On the cross-table lateral radiograph of the hip, the cortices of the anterior and posterior femoral neck diverge as the neck expands toward the femoral head. The axis of the femoral neck is the bisector angle between these divergent lines. The sagittal plane angle of the prosthesis was measured with respect to the axis of the femoral neck on the cross-table lateral view. This measurement of femoral neck version should be distinguished from true femoral anteversion, which is defined with respect to the long axis of the femur and the epicondylar axis.

Surgical Technique

The hip should be exposed through the surgeon’s preferred approach. The pin-centering method as described should be applicable to any operative approach. However, we use a posterior approach for all hip resurfacing cases; therefore, this method is described from the perspective of a posterior approach.

After exposure and dislocation of the hip, retractors are placed around the femoral head and neck to afford adequate exposure. For placement of the pin, the hip should be rotated to 90° with the knee bent and the lower leg pointing straight up to the ceiling (from the posterior approach) to allow accurate assessment of the femoral neck-shaft angle (Figure 1).

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