Posterolateral Minimal Incision for Total Hip Replacement: Technique and Early Results

Mark A. Hartzband

Development of a minimal incision posterolateral approach to total hip arthroplasty began in 1996. As experience was gained, incision length was progressively shortened. It became clear that modification of instruments would be required to facilitate arthroplasty through incisions of less than 10 cm. This approach involves more than simply a shorter skin incision. It incorporates minimal soft tissue dissection and eliminates portions of surgical exposure unnecessary for accurate and reproducible acetabular and femoral preparation. It is a technique that can be utilized in perhaps 95% of primary total hip arthroplasties.

Between January 1998 and July 2002, the author performed 1489 cases of minimal incision posterolateral total hip arthroplasties. Initially incision length of less than or equal to 10 cm was used to define the surgical procedure as a minimal incision approach. Of the 1489 cases, 670 patients had incisions less than 8.5 cm. Several different prostheses have been used with this approach. Hybrid and fully coated noncemented total hip components have been implanted without difficulty. For the past 5 years, the majority of the operations have been performed using a noncemented, proximally coated, tapered titanium stem (Fiber Metal Taper, Zimmer Inc., Warsaw, IN). A modular acetabular component has been used throughout the author’s surgical experience.

Surgical Technique

Patient selection is important, particularly during the early experience with minimal incision total hip arthroplasty. As the surgeon develops a level of comfort with the technique, it can be used in the vast majority of primary total hip candidates. A varus neck angle accompanied by a general lack of muscular development tends to facilitate the approach. As such, women may be better candidates as one starts to learn the technique. Long valgus femoral necks, particularly in muscular men, make a minimal incision total hip arthroplasty more difficult. As in all posterior approaches to the hip, significant external
rotation contracture makes for a more difficult exposure. Incision size should be progressively decreased in an intelligent fashion until a truly minimal posterolateral incision has been achieved.

It is critical to keep in mind that the primary goal of any joint replacement is to create a biomechanically and structurally sound arthroplasty with excellent prosthesis position and durable interfaces. If during the course of a procedure the surgeon is presented with circumstances that require extension of the incision to ensure that adequate exposure and proper component orientation is achieved, the incision should be lengthened without hesitation. The ease of extending the approach when necessary is a major advantage of this technique.

Patient Positioning and Landmarks

The patient is initially positioned in the lateral decubitus position with the surgical side up. It is critical that the patient be held firmly in the decubitus position with any one of several readily available hip holding devices that allow for free flexion of the operative limb and accurate assessment of pelvic position and orientation. A carpenter’s level is applied to the operating table to ensure that it is horizontal with respect to the floor. The level then is applied to the hip holding device so as to ensure that the patient is horizontal and, most importantly, that the pelvis is perpendicular to the floor. Any degree of forward roll of the pelvis severely compromises exposure of the acetabulum in a minimal incision posterolateral approach. It is important to keep in mind that most of the standard pelvic holding devices apply up to 20 degrees of flexion to the pelvis and therefore require a corresponding modification in acetabular component position so as to obtain appropriate acetabular anteversion.

As in all total hip arthroplasties, the most accurate method of obtaining proper leg lengths is by meticulous preoperative templating of the anterior/posterior (AP) and lateral views of the patient’s pelvis. The importance of preoperative templating cannot be overly stressed, particularly when performing a minimally invasive total hip arthroplasty. Standard intraoperative neck cutting guides may be easily used through minimally invasive total hip incisions. Any one of several available intraoperative leg length confirmation systems may be utilized with this approach as well.

Once the patient is draped, the landmarks for the incision are marked (Figure 9.1A and B). In minimal incision total hip arthroplasty, correct placement of the incision has major repercussions on the ease with which the procedure is performed. The true high point of the pelvis (i.e., the point at which the lumbar paraspinal muscles meet the lateral border of the posterolateral ileum) generally can be palpated in patients who are candidates for minimally invasive total hip arthroplasty. This point is marked and a second point approximately two fingerbreadths posterior to the high point of the pelvis and directed toward the center of the greater trochanter, is marked. This line generally represents a good approximation of the acetabular anteversion angle. The proximal most border of the greater trochanter is then identified. If difficulty