

Appendix

Description of Surgical Procedures

Twenty-nine patients had a total hip arthroplasty through the direct anterior approach. The patient was placed supine on a standard operating room table. A folded sheet was then placed under the sacrum, and an incision was made over the tensor fasciae latae. The tensor fasciae latae-sartorius interval was developed, and the lateral circumflex vessels were ligated. The capsule was incised, and the femoral head was transected into two pieces. The bone was removed with a 4.0-mm Shanz pin. Retractors were placed anterior, posterior, and medial, exposing the acetabulum. Standard reaming techniques were used. The cup was inserted under direct vision.

The femur was prepared by lowering the end of the operation table 30° to 40°. A posterior-superior capsular release was performed to bring the proximal part of the femur up into the wound. Retractors were placed to maintain elevation of the femur, and broaching was then commenced with use of offset broaches. After use of trial implants, the arthroplasty components were inserted, the hip was reduced, and the capsule was repaired. Standard fascial and skin closure was performed. The patient was mobilized immediately without precautions to prevent dislocation.

Twenty-eight patients were treated with a total hip arthroplasty through the mini-posterior approach. The patients were placed in the lateral position, and an incision was made along the posterior aspect of the femur, directed toward the posterior superior iliac spine. The iliotibial fascia and the fascia over the gluteus maximus were incised, and the muscle was split with blunt dissection. The short external rotators and the piriformis muscle were released along with the posterior aspect of the capsule from their insertion on the femur, with care taken not to injure the gluteus medius or minimus tendons. The quadratus tendon was not released. The neck cut was made, and the head was removed. The acetabulum was reamed in standard fashion, and then the cup was implanted. The femur was then reamed and broached. After insertion of trial components, the femoral component was implanted and the hip was reduced. The short external rotators and the capsule were repaired to the femur, and this was followed by closure of the fascia and skin. The patient was maintained on posterior hip precautions for six weeks.

All patients in both the anterior and the posterior group were treated with a cementless porous-coated prosthesis.

Description of Biochemical Analysis of Markers of Inflammation

All collected serum samples were stored at -20°C after being labeled without patient identifiers in a blinded fashion. Creatine kinase (CK) and C-reactive protein (CRP) levels were measured by a commercial laboratory. Serum levels of other cytokines—interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF- α), and interleukin-1 beta (IL-1 β)—were measured with use of commercial ELISA kits (Ready Set Go eBioscience, San Diego, California). The ELISA assay for each cytokine was performed according to the manufacturer's instructions at room temperature. Briefly, ELISA plates were coated with the capture antibody and were incubated overnight at 4°C . Wells were washed four times with phosphate-buffered saline solution (PBS) containing 0.01% Tween and then blocked for one hour with the blocking buffer supplied in the assay kits. Human cytokine standards and serum samples were introduced, and the plates were incubated overnight. After extensive wash steps, wells were incubated with detection antibody for one hour and then washed three times. Next, wells were incubated with avidin conjugated with horseradish peroxidase for thirty minutes, washed extensively, and incubated with substrate solution for fifteen minutes before development was stopped by the addition of stop solution (2-M sulfuric acid). Absorbance readings were determined with use of a microplate reader at 450 nm. The sensitivity and diagnostic range of each assay, determined with use of standards supplied in the kit, were as follows: IL-6, 2 to 2000 pg/mL; IL-1 β , 8 to 1000 pg/mL; and TNF- α , 4 to 500 pg/mL. The values for all five markers were reported as a rise as compared with the preoperative baseline.