Anterior Double-Incision Lateral Decubitus Approach

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Introduction

Total hip arthroplasty has become a commonplace and highly successful surgical procedure. Improvements in prosthetic design and bearing surfaces have led to expanded indications for hip replacement in younger, active patients. The demands of younger patients and increased expectations for earlier return to activity in older patients has led to a growing interest in less invasive methods of total hip arthroplasty. Mini-incision anterior, posterior, and multiple incision approaches have been described [1, 3, 4, 6-8]. So-called muscle-sparing procedures utilizing a modified anterior Smith-Petersen approach have been promoted as the least disruptive approach to the soft tissues in hip arthroplasty. There has been some hesitancy amongst surgeons to adopt these newer techniques that employ different surgical approaches to the hip when combined with a different patient positioning. The majority of North American surgeons have traditionally performed total hip arthroplasty with the patient in the lateral decubitus position. Muscle sparing anterior and multiple incision approaches have typically been described with the patient in the supine position [1, 7]. In an attempt to minimize changes in surgical routine a procedure and instrumentation were adapted to allow a two-incision muscle-sparing surgical approach with the patient in the lateral decubitus position. It is the authors’ firm belief that by maintaining standard patient positioning the surgeon is already familiar with, component placement errors can be minimized, and the requisite learning curve shortened.

Surgical Technique

Positioning and Acetabular Exposure

The patient is placed in the lateral decubitus position with the affected side up. Low profile pelvic positioners may be placed at the pubic symphysis level and at the sacrum to stabilize the pelvis. Care should be taken such that any positioning devices do not interfere with hip range of motion. The lower extremity is prepped and draped free. Anatomic landmarks are identified as follows: the anterior superior iliac spine (ASIS), the greater trochanter (GT), and the lateral border of the patella. The anterior skin incision is made just lateral and parallel to the line extending from the lateral border of the patella to the ASIS. The lateral femoral cutaneous nerve lies in proximity to the incision, if identified efforts should be made to protect it, often retracting it medially with the underlying sartorius [2,5]. The lateral femoral cutaneous nerve lies in proximity to the incision, if identified efforts should be made to protect it, often retracting it medially with the underlying sartorius [2,5]. The underlying tensor fasciae latae muscle (TFL) is identified. The muscle fasciae is incised along the medial border of the muscle (in large heavily muscled individuals the dissection may proceed 1-3 cm lateral to the medial border of the TFL muscle) and blunt finger dissection is carried out to the hip-joint capsule overlying the femoral neck (Figs. 7.106, 7.107). Retractors are placed inferior and superior to the hip-joint capsule. The anterior capsule is tightened, and exposure enhanced by placing the leg in an abducted and externally rotated position. The reflected head of the rectus femoris muscle may be resected or bluntly elevated of the capsule. Frequently, the ascending branch of
the lateral femoral circumflex artery is in the operative field and may need to be ligated [5]. A complete resection of the pathologic anterior and superior capsule is performed. Osteotomy of the femoral neck is performed at the level determined by pre-operative templating. A second osteotomy is made proximal to this to remove a wedge of bone and facilitate femoral head removal. Acetabular retractors are placed to expose the socket. Lighted retractors may be used, alternatively, the author's preference is to use a headlight for visualization. Acetabular reaming is carried out in the usual fashion. Special angled acetabular reamer shafts are helpful with smaller incisions (Fig. 7.108). Excision of osteophytes, labrum, and capsular releases are carried out as necessary. Implantation of the acetabular component is carried out in the usual fashion, curved acetabular insertion handles are utilized. Through the anterior incision, the GT is visualized and a ronguer is used to make a notch along the medial aspect of the GT. This notch will serve as a palpable landmark for the starting point of the femoral reamers and broaches to avoid varus positioning of the component.

Fig. 7.105. Patient in the lateral decubitus position with landmarks identified and proposed skin incision marked. GT Greater trochanter, ASIS anterior superior iliac spine, P patella

Fig. 7.106. After making the skin incision the medial edge of the tensor fasciae latae muscle (TFL) is identified, the sartorius (S) lies medial to it. Blunt finger dissection is performed at this interval down to the hip joint capsule

Fig. 7.107. Retractors are placed superior and inferior to the hip joint capsule (HJC), the tensor fasciae latae is seen in the lateral aspect of the wound

Fig. 7.108. Angled reamer shaft allows acetabular preparation through smaller skin incision
Femoral Preparation

The surgeon moves to the opposite side of the operating table, behind the patient. The limb is placed in the figure-4 position over the table. This allows consistent positioning of the femur to control anteversion during preparation of the femur. A smooth Steinmann pin is placed percutaneously through the skin to enter the femur near the notch created in the GT. Palpation and direct visualization of the proximal femur through the anterior incision confirms appropriate positioning of the pin. Once satisfactory pin placement is obtained it is used as a reference for the skin incision. A 2–5 cm skin incision is made in line with the proposed anteversion of the femoral component. Preparation of the femur is carried out specific to the implant design. The author’s preference is for a proximally fixed wedge-taper design stem. The femoral canal is opened with a starter reamer followed by a trochanteric lateralizing reamer to prevent varus and flexion, a self retaining retractor with deep 60–70 mm feet protects the soft tissues (Fig. 7.109). Sequential femoral broaching is performed, based on pre-operative templates. Correct broach placement is confirmed by inspection through the anterior incision. Through the anterior incision, the calcar can be inspected for cracks and to ensure complete seating of broaches/implants. The femoral implant is then inserted (Fig. 7.110) and trial reduction performed to determine head length. The femoral head is placed on the trunion through the anterior incision.

Stability and Range of Motion Check

With the lateral decubitus position, no special operating tables are necessary and hip range of motion can be checked in all directions including hyperextension. The hip is brought into full or slight hyperextension, adducted and externally rotated to check anterior stability. Anterior stability is further tested in varying degrees of flexion (to 110° or more), external rotation and adduction. Posterior stability is tested in external rotation throughout the flexion–extension arc. Wound closure is a simple layered closure utilizing a subcuticular absorbable suture. Drains are not routinely used. All wounds are infiltrated with 0.25% bupivacaine with 1:200000 epinephrine, 30–90 cc, based on body weight. Antibiotic ointment, non-adherent dressings and a clear occlusive dressing cover the wounds.

Post-Operative Care

Passive range of motion is started immediately in the recovery room. The patient is allowed out of bed, full weight-bearing the day of surgery. Patients are allowed to advance to a single cane when tolerated, usually within the first 10 days post-operatively. Many patients leave the hospital utilizing a single cane for support. Most patients do not regularly use any assistive devices after 2–3 weeks post-operatively. Dressings are changed on day 2 post-operatively, then daily. Showers are allowed anytime after the initial dressing is
removed. No specific hip precautions are observed after 3–4 weeks after surgery.

**Results and Complications**

In the first 150 patients utilizing this technique no dislocations have occurred. Calcar cracks, recognized intraoperatively and cabled prophylactically occurred in 3/150 patients. One patient without an intra-operatively recognized calcar crack sustained a post-operative fracture upon arising from a chair and twisting. This was successfully treated by femoral revision and cabling. If an intra-operative calcar fracture is identified, it can be easily treated with cerclage wires or cables through the anterior incision (Fig. 7.111). All calcar cracks occurred early in the learning curve, no cracks occurred in the last 112 surgical procedures. In extremely osteoporotic bone, prophylactic cerclage wires may be placed. If more extensive exposure is required, the anterior approach is extensible and can be extended distally to expose the entire femoral shaft and proximally to expose the lateral aspect of the ilium [4].

Post-operative radiographs demonstrate the ability to consistently place the components in the appropriate position. Neutral femoral alignment was obtained and average acetabular abduction on post-operative radiographs measured 46° (Fig. 7.112). Five percent of patients required homologous blood transfusion.

**Conclusions**

A muscle-sparing two-incision surgical approach with the patient in the lateral decubitus position affords the surgeon the ability to maintain landmarks and orientation he is already accustomed to. The technique described appears to be safe and allows for an extensible approach should untoward intra-operative complications arise. Subjective patient satisfaction is high and demand for this procedure continues to grow. Long-term studies of this and other muscle-sparing approaches will be necessary to determine if overall outcomes are similar to or superior to conventional approaches.

**References**