

***АНАТОМИЯ ОБЛАСТИ ТАЗОБЕДРЕННОГО СУСТАВА ПРИМЕНительно К
ПЕРЕДНЕЕ-ЛАТЕРАЛЬНОМУ ХИРУРГИЧЕСКОМУ ДОСТУПУ***

Терещенко А. А., Шиян Д. Н., Якименко Д. С., Резникова А. С.

Харьковский Национальный Медицинский Университет

Харьков, Украина

***ANATOMY OF THE HIP, APPLIED TO THE SURGICAL
ANTEROLATERAL APPROACH***

Tereshchenko A. A., Shiyani D. N., Yakymenko D. S., Resnikova A.S.

Kharkiv National Medical University

Kharkiv, Ukraine

The anterolateral approach is the approach most commonly used for total joint replacements. The uses of the anterolateral approach include the following: total hip replacement, hemiarthroplasty, open reduction and internal fixation of femoral neck fractures, synovial biopsy of the hip, biopsy of the femoral neck.

APPLIED SURGICAL ANATOMY OF THE ANTEROLATERAL APPROACH

The fascia lata covers all the thigh and hamstring muscles around the hip joint. In hip surgery, its importance lies in its relationship to three muscles, the sartorius, the tensor fasciae latae, and the gluteus maximus. The fascia lata covers the sartorius; it also splits into a deep and superficial layer to enclose the tensor fasciae latae and gluteus maximus. If the iliac crest is viewed from the lateral side, the outer layer of the covering seems to consist of the fascia lata of the thigh and the muscles that it encloses. The sartorius lies farther anteriorly. The gluteus medius, which arises from the outer wing of the ilium, is covered by the fascia lata, not enclosed by it. (Fig. 1.1)

The key to the anterolateral approach to the hip lies in the relationship between the tensor fasciae latae and the gluteus medius. The tensor fasciae latae, a superficial structure, arises from the anterior portion of the outer lip of the iliac crest. The gluteus medius arises from the outer wall of the ilium, between the anterior and posterior gluteal lines. The origins of the two muscles are, therefore, almost continuous, but the tensor fasciae latae is slightly more superficial (lateral) and anterior than the gluteus medius. (Fig. 1.1)

The tensor fasciae latae inserts into the iliotibial tract, the thickening of the deep fascia of the thigh, while the gluteus medius inserts into the anterior and lateral part of the greater trochanter. Thus, as the muscles run from origins to insertions, the tensor fasciae latae rises to an even more superficial position in relation to the gluteus medius. (see Fig. 1.1)

To exploit the intermuscular plane between the gluteus medius and the tensor fasciae latae, incise the fascia lata posterior to the posterior margin of the tensor fasciae latae and retract the cut fascial edge anteriorly. Because the fascia lata actually encloses the tensor fasciae latae, the muscle is retracted with the fascia. (see Fig. 1.1)

All anterolateral approaches use this one intermuscular plane to reach the femoral neck; then they follow the joint capsule medially to expose the anterior rim of the acetabulum.

LANDMARKS AND INCISION

Landmarks

The anterior superior iliac spine is the site of attachment of two important structures. The sartorius takes its origin from it, and the inguinal ligament uses it as a lateral attachment. The anterior superior iliac spine is rarely used as a bone graft because the lateral cutaneous nerve of the thigh lies so close to it.

The anterior third of the iliac crest serves as the origin for the following three muscles:

1. The external oblique forms the outer layer of the muscles of the anterior abdominal wall. It originates from the outer strip of the anterior half of the iliac crest.
2. The internal oblique forms the middle layer of the muscles of the anterior abdominal wall. It originates from the center strip of the anterior half of the iliac crest.
3. The tensor fasciae latae arises from the outer lip of the anterior half of the iliac crest.

The greater trochanter is the traction apophysis of the proximal femur and the site of the insertion of the gluteus medius and minimus muscles. The vastus lateralis ridge results partly from the pull of the aponeurosis of the vastus lateralis during growth and partly from the fusion of the trochanter apophyses of the shaft of the femur. (Fig. 1.1; 1.2)

Incision

Flex the leg about 30° and adduct it so that it is lying across the opposite knee both to bring the trochanter into greater relief and to move the tensor fasciae latae anteriorly. Make a 15-cm straight longitudinal incision centered on the tip of the greater trochanter. The incision crosses the posterior third of the trochanter before running down the shaft of the femur. The position moves the neurovascular bundles anteriorly, lessening the risk that they will be injured during surgery. The approach can be done through an alternate incision. Begin the incision 5 cm behind the anterior superior iliac spine, but level with it. Continue incising down to the posterior aspect of the trochanter before curving down over the shaft of the femur to form a V-shaped incision.

SUPERFICIAL SURGICAL DISSECTION

Incise the fat in line with the skin incision to reach the deep fascia of the thigh. Run your finger from posterior to anterior and palpate the tensor fasciae latae, the anterior bulge under the deep fascia. Incise the fascia in the distal end of the wound over the shaft of the femur to expose the

vastuslateralis. Continue the fascial incision proximally, taking care to stay posterior to the palpable posterior border of the tensor fasciae latae. In the upper part of the wound, the gluteus medius appears when you retract the cut edge of the fascia anteriorly. Insert a self-retaining retractor and retract the cut fascia anteriorly and posteriorly. A series of vessels cross the interval between the tensor fasciae latae and the gluteus medius; they need ligation.

Now place a right-angled retractor deep to the gluteus medius and retract the muscle proximally and laterally away from the superior margin of the joint capsule that covers the femoral neck -still covered with fat.

Fully externally rotate the hip to put the capsule on stretch. Identify the origin of the vastuslateralis at the vastuslateralis ridge. Incise the origin using a cautery knife, and reflect the muscle inferiorly for about 1 cm. Under it is the anterior aspect of the joint capsule, at the junction of the femoral neck and shaft. Bluntly dissect up the anterior part of the joint capsule, lifting off the fat pad that covers it. The fat pad can reduce postoperative scarring and adhesions and should be preserved even though it intrudes into the operative field.

DEEP SURGICAL DISSECTION

Deep surgical dissection consists in detaching part or all of the abductor mechanism and then dissecting up the femoral neck superficial to the capsule of the joint until a suitable retractor can be placed over the anterior lip of the acetabulum. Two techniques improve exposure of the acetabulum by neutralizing the abductor mechanism.

1. Trochanteric osteotomy. Palpate the vastuslateralis ridge on the lateral border of the femur, from distal to proximal. Osteotomize the trochanter and reflect it upward with the attached gluteus medius and minimus muscles. The base of the osteotomy should be at the base of the vastuslateralis ridge.

2. Partial detachment of the abductor mechanism. Place a stay suture in the anterior portion of the gluteus medius just above its insertion into the greater trochanter. Cut the insertion of this anterior portion off the trochanter. Identify the thick white tendon of the gluteus minimus as it inserts onto the anterior aspect of the trochanter and incise it. Bluntly dissect up the anterior surface of the hip joint capsule in line with the femoral neck and head. Detach the reflected head of the rectus femoris from the joint capsule to expose the anterior rim of the acetabulum.

Place a retractor on the anterior rim of the acetabulum. Make certain that the dissection and the insertion of retractors remain beneath the rectus femoris and iliopsoas, because the neurovascular bundle lies anterior to the psoas. Incise the anterior capsule of the hip joint with a longitudinal incision. Develop this into a T-shaped incision by cutting the attachment of the capsule to the acetabulum as far around as you can reach. Now incise the capsule transversely at the base of

the neck to convert the T-shaped incision into an H-shaped one. Dislocate the hip by externally rotating it after you have performed an adequate capsulotomy.

The key to a full exposure of the acetabulum lies in correctly placing the retractors. Different approaches use different retractors, but three or four Homan-type retractors placed around the lip of the acetabulum, directly on bone, give as good an exposure as any.

DANGERS

Nerves

The femoral nerve is the most laterally placed structure in the neurovascular bundle in the femoral triangle. The most common problem is compression neurapraxia, caused by overexuberant medial retraction of the anterior covering structures of the hip joint.

Vessels

The femoral vessels enter the thigh beneath the inguinal ligament. They lie on the psoas major muscle, halfway between the anterior superior iliac spine and the pubic tubercle, the mid-inguinal point. The femoral artery is thus directly anterior to the hip joint, with the psoas muscle interposed. The femoral nerve lies lateral, and the femoral vein medial, to the artery. (This arrangement can be remembered through the mnemonic VAN—Vein, Artery, Nerve.).

The femoral artery and vein may be damaged by incorrectly placed acetabular retractors that penetrate the iliopsoas, piercing the vessels as they lie on the surface of the muscle. You can avoid this complication by making sure that the tip of the retractor is placed firmly on bone, with no intervening tissue.

The profundafemoris artery lies on the psoas muscle, deep to the femoral artery. It has also been damaged by poorly placed retractors.

Fractures of the Femoral Shaft

Femoral shafts have been known to fracture while hips are being dislocated. For that reason, it is critical that you do an adequate capsular release before attempting dislocation. If you cannot dislocate the hip without resorting to extreme force, it is safer to perform a double osteotomy of the femoral neck, excising a 1-cm portion of it: Then remove the femoral head (which is lying free) with a corkscrew.

