Traditional Approaches to the Hip

Direct Anterior Approach to the Hip

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The first descriptions of the anterior approach to the hip are attributed to Sprengel (1878), Bardenheuer (1907), Depuy de Frenelle (1924) and Larghi. Smith-Peterson (1917, 1949) has improved and revived the interest in this approach, which he utilized for his technique in mold arthroplasty [1-4]. Nearly all surgery of the hip joint may be carried out through this approach, or separate parts can be used for different purposes.

The whole iliac wing and the hip joint can be approached by the iliac portion of the incision. It is especially used for access to the anterolateral part of the femoral head and neck. It permits a direct access to the acetabulum and frees the superior part of the femur without extensive detachment of the gluteal muscles from the iliac wing or without tenotomies of the outer rotators. Letournel and Judet (1974) described an iliofemoral approach which allows surgical extension to laterally expose the anterior and posterior pelvic columns [2,4].

The inferior part of the approach, denominated as Hueter-Schede, does not even need any muscular detachment besides the eventual dissection of the tendinous origin of the rectus femoris muscle [2,3].

The anterior approach gives safe access to the hip joint and ilium by exploiting the internervous plane between the sartorius and the tensor fasciae latae muscles. Its is used for

- Open reduction of congenital dislocations of the hip
- Pelvic osteotomies
- Excision of tumors of hip and pelvis
- Total hip arthroplasty
- Hemiarthroplasty
- Resurfacing arthroplasty
- Synovial biopsies.

Technique

The patient is placed supine on the operating table. To free the posterior border of the iliac wing put a small pad under the affected buttock to push the affected hemipelvis forward. The whole lower extremity is prepared to allow manipulation of the leg and the hip during the intervention.

Identify the anterior superior iliac spine, which is subcutaneous and easily palpable in thin patients. The groove between the tensor fasciae latae and sartorial muscle is easily found below the anterior superior iliac spine. In obese patients, when covered by adipose tissue, you can locate it more easily if you bring your thumbs up from distal.

The iliac crest serves as a point of origin and insertion for the gluteal and the tensor fasciae latae muscles and can be palpated subcutaneously.

The skin incision starts in the middle of the iliac crest, but for a larger approach the starting point can also be set more posteriorly. The incision follows the crest approximately 2 cm distal to prevent painful adhesions of the scar to the bone. It proceeds to the anterior superior iliac spine and from there is vertically curved down the thigh heading toward the lateral border of the patella. (Fig. 6.1).

The approach uses an internervous plane between the femoral nerve and the superior gluteal nerve. It lies superficially between the sartorial and the tensor fasciae latae muscles, the deep dissection uses the plane between the rectus femoris and the gluteus medius and minimus muscles.

The superficial and the profound fasciae lateral to the sartorial muscle are incised on the medial border of the tensor fasciae latae muscle. The lateral cutaneous
Fig. 6.1. The skin incision runs parallel to the iliac crest and proceeds to the superior iliac spine where it vertically curves down the thigh heading toward the lateral border of the patella. 1 iliac crest; 2 anterior superior iliac spine

femoral nerve, which pierces the deep fascia just below the anterior superior iliac spine, is identified and shifted with the sartorial muscle (Fig. 6.2). Staying within the fascial sheath of this muscle will protect you from damaging the lateral femoral cutaneous nerve because the nerve runs over the fascia of the sartorius. It should be noted that the nerve may also lie lateral to the sartorial muscle. Retract the sartorius upwards and medially and the tensor fasciae latae downwards and laterally.

The anterior part of the tensor fasciae latae muscle is subperiosteally detached from the iliac wing where it is fibrously attached to the iliac crest. This can be performed in an avascular zone as it is not necessary to cut muscle fibers. Following detachment of the tensor fasciae latae, there is a good view on the gluteus medius muscle and the rectus femoris muscle, which contrasts by its tendineous appearance from the neighboring muscles.

With a periosteal elevator, strip the periosteum with the attachments of the gluteus medius and minimus muscles from the lateral surface of the ilium. Control bleeding from the nutrient vessels by packing the interval between the ilium and the reflected muscles with gauze sponges. Individual bleeding points can be controlled by the application of bone wax.

Now carry the dissection through the deep fascia of the thigh and between the tensor fasciae latae laterally and the sartorius and rectus femoris medially. Clamp and ligate the ascending branch of the lateral femoral circumflex artery, which lies 5 cm distal to the hip joint.

Identify the origin of the rectus femoris muscle (Fig. 6.3). The rectus femoris originates with its direct head from the anterior inferior iliac spine, and the
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Fig. 6.3. Following subperiosteal detachment of the tensor fasciae latae from the iliac wing identify the origin of the rectus femoris muscle (direct and reflected head). The ascending branch of the lateral femoral circumflex artery, which lies 5 cm distal to the hip joint has to be clamped or ligated. 7 ascending branch of lateral femoral circumflex vessels; 8 rectus femoris with its direct and reflected head; 9 tensor fasciae latae; 10 detachment of tensor fasciae latae at iliac crest; 11 gluteus medius; 12 sartorius

Fig. 6.4. Following detachment of the rectus femoris from both its origins bluntly separate the iliopsoas muscle from the capsule medially and retract the gluteus muscle laterally. Now the hip joint capsule is fully exposed and can be incised. 8 rectus femoris; 13 capsule of the hip joint; 14 psoas muscle; 15 femoral head; 16 anterior inferior iliac spine

reflected head from the superolateral lip of the acetabulum and the anterior capsule of the hip joint. The reflecting head is intimate with the capsule and has to be split from the capsule of the adjacent hip joint. Detach the rectus femoris from both its origins and retract it medially. Retract the gluteus medius laterally.

The iliopsoas muscle is also separated from the capsule by blunt dissection and held aside. Then the whole anterior aspect of the hip joint is exposed.

The capsule of the hip joint is now exposed. Inferomedially, you can see the iliopsoas as it approaches the lesser trochanter: retract it medially. The iliopsoas is often partly attached to the inferior aspect of the hip joint capsule and must be released from it.

Inferolaterally, the shaft of the femur lies under cover of the vastus lateralis. Adduct and fully externally rotate the leg to put the capsule on stretch; incise the hip joint capsule as the surgery requires. The capsule is longitudinally incised following the axis of the femoral neck, and transversely dissected parallel to the acetabular roof. In order to anteriorly dislocate the hip, the capsule has to be opened as wide as necessary and may be excised as well as a part of the acetabular labrum (Fig. 6.4). Dislocate the hip by external rotation and adduction.

Dangers

The lateral femoral cutaneous nerve usually leaves the pelvis by passing deep to the lateral end of the inguinal ligament about 1 cm medial to the anterior superior iliac spine. The nerve then splits into anterior and posterior divisions approximately 5 cm below the anterior superior iliac spine and continues distally to innervate the skin over the lateral aspect of the thigh. Alternatively, the nerve may be absent, with a branch from the femoral nerve arising below the inguinal ligament, or it may be replaced by the ilioinguinal nerve.

The nerve should be preserved when you incise the fascia between the sartorius and the tensor fasciae latae. If the nerve is cut, this may lead to the formation of a painful neuroma and may produce an area of diminished sensation on the lateral aspect of the thigh (meralgia paresthetica).

The variability of the course of the lateral femoral cutaneous nerve suggests that during any operative approach to the iliac crest or inguinal region, awareness
that it may cross the surgical site is the only way to pre-
vant injury to this nerve.

The ascending branch of the lateral femoral circum-
ex artery crosses the operative field, running proximal-
ly in the internervous plane between the tensor fasciae
latae and the sartorius. Ligate or coagulate it when you
separate the two muscles.

**Extensile Procedures**

The skin incision may be extended posteriorly along the
iliac crest to expose the iliac bone.

To extend the approach distally, lengthen the skin
incision downward along the anterolateral aspect of the
thigh. Incise the fascia lata in line with the skin incision;
underneath lies the interval between the vastus lateralis
and the rectus femoris. To expose the shaft of the femur
you will have to split muscle fibers in this interval. You
may as well use the interval between the vastus lateralis
muscle and the intermuscular septum.

The approach can be as well extended to visualize
the inner and outer wall of the pelvis for pelvic osteoto-
my. Gently strip the muscular coverings from the bone at
the level of the origin of the reflected head of rectus
using blunt instruments. This dissection will lead you
into the sciatic notch. Take great care to stay close to the
bone, since the sciatic nerve is also emerging through
the notch. Following detachment of the rectus femoris
from the anterior inferior iliac spine, carefully lift off the
iliacus muscle from the inside of the pelvis. Proceed by
blunt dissection until the greater sciatic notch is reached
and both instruments are in contact with each other and
with the bone of the sciatic notch. This allows sufficient
visualization of the entire thickness of the pelvis to per-
mitting an accurate osteotomy.

For exposure of the posterior column detach the
insertion of the glutei from the greater trochanter. This
can be performed either by dividing this insertion with
a knife or preferably by a trochanteric osteotomy. Pay
attention to the superior gluteal nerve and artery which
emerge through the greater sciatic notch and serve the
gluteus medius and minimus muscles. Do not stretch
these vessels unless you risk thrombosis that may lead to
massive muscle necrosis. Part of the posterior column of
the acetabulum and the lateral aspect of the iliac crest
are now exposed.

To access the inner part of the iliac wing until the
sacroiliac joint, subperiosteally lift off the iliacus muscle
after detachment of the origins of the abdominal mus-
cles from the iliac crest.

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