Unit 33: Anterior and Medial Thigh

Dissection Instructions:

The skin is thin over much of the lower limb, so make swallow incisions. Starting at the region of the pubic bone and continuing to the region of the anterior inferior iliac spine make a series of incisions approximately 2 - 3 inches apart. Continue these incisions to two inches below the knee. This should include the anterior and medial aspects of the thigh. Stripe by stripe carefully separate the skin from the subcutaneous tissue and then pull the skin towards the knee.

The superficial fascia contains cutaneous veins and nerves which should be cleaned. In cleaning the major veins, do not destroy the cutaneous nerves that accompany them. Find the greater saphenous vein as it passes about a hand's breadth from the medial border of the patella of the knee. Follow it to the saphenous opening in the fascia lata below the medial end of the inguinal ligament (Plates 526, 528; 5.5A, 5.7A&B, 5.11). During its course, it frequently divides and rejoins, and receives many tributaries.

About three inches below the anterior superior iliac spine, dissect into the superficial fascia and locate the lateral femoral cutaneous nerve (Plates 482, 520, 526; 5.13A, 5.14). When you find it, verify its identity by showing its continuity with the intraabdominal lateral femoral cutaneous nerve. Do not cut the inguinal ligament to do this. Follow this nerve to the knee. At about mid-thigh, look for branches of the femoral nerve. They should be parallel to the lateral femoral cutaneous nerve and spaced about every inch across the anterior thigh. They are the anterior cutaneous nerves of the thigh (Plates 526; 5.3A).

The skin and superficial fascia also receive an arterial supply, but it consists of mostly small cutaneous branches. The largest of these are found in the region of the saphenous opening and are branches of the femoral artery in the femoral triangle. The superficial circumflex iliac artery is a small artery which passes laterally on the upper thigh. The superficial epigastric was seen on the anterior abdominal wall. The external pudendal arteries pass medially to the external genitalia (Plates 482; 5.9, 5.11).

Without destroying the superficial vessels and nerves, remove the remaining superficial fascia and demonstrate the deep fascia.

Locate the tensor fascia lata muscle taking origin from the anterior superior iliac spine and adjacent iliac crest (Plates 476, 526, 528; 5.8). Define the iliotibial tract and follow it to the lateral condyle of the tibia. The iliotibial tract serves as the tendon of insertion of the tensor fascia lata and gluteus maximus muscles (Plates 478; 5.8B, 5.22B). Carefully make an incision along the anterior border of the muscle and tract from just below the inguinal ligament to the knee. Now remove the rest of the fascia lata which covers the anterior and medial compartments of the thigh without destroying the cutaneous nerves and vessels.

Clean the borders of the sartorius muscle (Plates 474; 482; 5.17). It takes origin from the anterior superior iliac spine and inserts on the anteromedial aspect of the tibia below the tibial condyle. Clean the adductor longus muscle from its origin off the pubic bone to where it goes deep to the sartorius. The inguinal ligament, medial border of the sartorius and lateral border of the adductor longus form the boundaries of the femoral triangle (Plates 474, 482; 5.13B, 5.14). The inguinal ligament is the base of the triangle and the apex is where the two muscles cross. The major contents of the triangle
are the femoral nerve, artery and vein. Judge the distance from the anterior superior iliac spine to the symphysis pubis and find the mid-point, the mid-inguinal point. It should lie immediately over the artery. The vein is on the medial side of the artery and the nerve is on the lateral side, but at a deeper level. Medial to the vein is the femoral canal. The femoral canal, femoral vein and femoral artery are contained in a connective tissue sheath, called the femoral sheath (Plates 482, 528; 5.13A&B). It is derived from the fascias inside the abdominal cavity. Each structure in the sheath has its own compartment. Femoral hernias pass through the femoral canal and appear as a swelling at the saphenous hiatus.

The femoral nerve, which enters the triangle deep to the iliopsoas fascia, quickly breaks into all of its peripheral branches (Plates 482, 483; 5.14). These branches will be identified as the dissection continues. Clean the femoral artery and vein and note that at the apex of the femoral triangle the vein is deep to the artery. On the deep surface of the femoral artery, find the deep femoral artery. The deep femoral artery usually gives rise to both the medial femoral circumflex and lateral femoral circumflex arteries (Plates 483; 5.9, 5.14, 5.21). The medial femoral circumflex artery comes off the deep femoral and quickly divides into ascending, transverse and descending branches. Elevate the sartorius and follow the descending branch into the vastus lateralis head of the quadriceps femoris muscle. It is accompanied by the nerve to the vastus lateralis. The ascending branch passes under the tensor fascia lata on its way into the gluteal region. The transverse branch is the smaller of the three and goes directly around the femur in a horizontal path. The medial and/or lateral femoral circumflex arteries may branch from the femoral artery instead of the deep femoral. The deep femoral artery leaves the femoral triangle by passing deep to the adductor longus muscle to enter the medial compartment.

The floor of the femoral triangle is formed by the iliopsoas and pectineus muscles (Plates 474 5.15). A septum of connective tissue separates these two muscles and the medial femoral circumflex branch of the femoral or deep femoral artery will pass between them.

Clean the four heads of the quadriceps femoris muscle (Plates 474; 5.17, Table 5.2 and figures-p. 358). The vastus lateralis head has already been identified. Pass your hand between the tensor fascia lata or the iliotibial tract as far lateral and posterior as possible. When your fingers encounter the lateral intermuscular septum, they can go no farther. The vastus lateralis muscle takes origin from the upper femur, lateral lip of the linea aspera and the lateral intermuscular septum. It inserts on the upper and lateral borders of the patella. The medial border of the vastus medialis muscle lies under the sartorius and adjacent to the medial intermuscular septum. Its origin is primarily from the medial lip of the linea aspera. The most inferior fibers of the vastus medialis extend to a lower level than those of the vastus lateralis and are more horizontally placed (Plates 482; 5.17, 5.18). The insertion is on the upper and medial borders of the patella. Between the vastus medialis and vastus lateralis muscles are the rectus femoris and vastus intermedius muscles. The rectus femoris is superficial to the vastus intermedius. It takes origin from the anterior inferior iliac spine by a straight head and from the upper margin of the acetabulum by an oblique head ). The two tendinous heads join to form a common tendon of origin which broadens into the belly of the muscle. The muscle narrows again before inserting on the superior border of the patella. The vastus intermedius takes origin from almost the entire circumference of the femur except the linea aspera and inserts on the upper border of the patella. Clean the surface of the patellar ligament from the patella to the tibial tuberosity. The patella is a sesamoid bone and the patellar ligament was the original insertion of the quadriceps femoris muscle. The quadriceps femoris is the primary extensor of the leg at the knee. The rectus femoris is also a flexor of the hip.

Identify the branches of the femoral nerve which innervate the four heads of the quadriceps femoris, pectineus and sartorius muscles (Plates 482, 483, 520; p. 348). Some branches are purely
cutaneous to the anterior surface of the thigh while others innervate the sartorius before becoming cutaneous. When you clean the nerve to the vastus medialis, note that it is adjacent and parallel to another nerve, the saphenous branch of the femoral nerve. This nerve lies under the sartorius with the femoral artery until they reach the upper knee, then it becomes cutaneous and travels with the greater saphenous vein.

The medial osteofascial compartment of the thigh contains the adductor muscles (Plates 473-475; 5.17-5.19, Table 5.3 and figures-p. 360). Clean the gracilis muscle. It takes origin from the ischiopubic ramus and inserts with the sartorius below the medial condyle of the tibia. It adducts the thigh and helps in flexing the leg at the knee. The pectineus muscle takes origin from the upper surface of the superior ramus of the pubic bone. It inserts on the pectineal line of the femur below the lesser trochanter. Its lower border is adjacent to the upper border of the adductor longus. Clean the adductor longus from the pubis to its insertion on the middle third of the linea aspera. Near its insertion it may be fused to the adductor magnus muscle. Besides adducting, the pectineus and adductor longus muscles are medial rotators. Carefully locate the adductor brevis muscle between the adductor longus and adductor magnus muscles. Its limits are defined by the anterior and posterior divisions of the obturator nerve. It takes origin from the pubis and inserts on the upper half of the linea aspera. If the pectineus and adductor longus muscles are separated from each other, the adductor brevis can be seen between them. The adductor magnus muscle is the largest of the adductor muscles and has the most extensive origin and insertion (Plates 475; 5.21). It takes origin from the ischiopubic ramus and the ischial tuberosity adjacent to where the hamstring muscles arise. Its most anterior and superior fibers are horizontal and its most posterior and inferior fibers are vertically oriented. The muscle is divided into parts by the perforating branches of the deep femoral vessels and the passage of the femoral vessels into the popliteal fossa (Plates 482, 483; 5.21).

The pectineus muscle is usually innervated by a branch of the femoral nerve which passes posterior to the femoral artery and vein. All the remaining muscles of the adductor chamber are innervated by the obturator nerve. Locate the anterior and posterior divisions of the obturator nerve and follow them superiorly until they are seen coming out of the external obturator muscle (Plates 483, 5.21) The obturator externus muscle covers the obturator foramen on the outside as the obturator internus does on the inside of the pelvis. The obturator externus is innervated by the obturator nerve as it passes through. The muscle is a lateral rotator and adductor of the hip. The fibers of the adductor magnus muscle which take origin from the ischial tuberosity may receive additional innervation from the sciatic nerve.

Clean the femoral artery and vein from the apex of the femoral triangle to the hiatus in the adductor magnus muscle where they change their name from femoral to popliteal (Plates 482-484; 5.9, 5.28). During this course they are deep to the sartorius muscle in the subsartorial or adductor canal. The saphenous nerve travels with them in the canal but leaves them when they pass through the adductor magnus muscle. The last branch of the femoral artery before it changes its name is the descending genicular artery, which quickly divides into muscular, articular and saphenous branches (Plates 483, 494; 5.9, 5.28).
Be sure to identify all of the following in this unit:

- superficial fascia
- greater saphenous vein
- saphenous opening
- lateral femoral cutaneous nerve
- cutaneous branches of femoral nerve
- superficial circumflex iliac artery
- superficial epigastric artery
- external pudendal artery
- tensor fascia lata muscle
- iliotibial tract
- sartorius muscle
- femoral triangle
- inguinal ligament
- femoral canal
- femoral vein
- femoral artery
- femoral sheath
- femoral nerve
- deep femoral artery
- medial femoral circumflex artery
- lateral femoral circumflex artery
- descending branch of lat. femoral cir. a.
- nerve to vastus lateralis
- iliopsoas muscle
- pectineus muscle
- quadriceps femoris muscle
- lateral intermuscular septum
- vastus lateralis muscle
- vastus medialis muscle
- rectus femoris muscle
- vastus intermedius muscle
- patellar ligament
- gracilis muscle
- adductor longus muscle
- adductor magnus muscle
- adductor brevis muscle
- obturator nerve
- anterior & posterior division of obturator nerve
- obturator externus muscle
- adductor canal
- saphenous nerve
- descending genicular artery