

Hip Joint: Part Two

By Tracy Anderson

Last month I covered the joint capsule, ligaments and anterior (front) muscles spanning the hip joint. This month I will continue with the posterior (rear) muscles spanning the hip joint and conclude with common injuries and rehabilitation.

Muscles can only shorten, and these muscles span the posterior side of the hip joint, hence they will act to extend and hyperextend the hip. Flexion of the hip is to decrease the angle of the hip joint, as you would when you kick or raise your leg toward the front. Extension of the hip joint is returning back to anatomical position, with both feet on the floor. Hyperextension is moving your leg past anatomical position, or moving one leg behind the other.

Some muscles that span the hip joint, also span the knee joint. As in the previous article, the knee portion will be discussed later. Muscles that span the posterior hip joint are the gluteus maximus, medius and minimus, semimembranosus, semitendinosus, biceps femoris, and the tensor fascia latae muscles.

Before we begin to discuss the aforementioned muscles, I must mention the deep rotator muscles. These are six small, deep muscles that span the hip joint in a horizontal direction, and they function to laterally rotate the hip. To rotate the hip laterally, you would turn your right leg clockwise, and left leg counter-clockwise. Simply, turn your toes outward. Realize that your upper leg must rotate, not just your ankle. All six muscles work together and produce the same motion.

The most recognized of the deep rotator muscles is the piriformis, because of its relationship to the sciatic nerve. Tightness of this muscle is a common cause of sciatic pain. The sciatic nerve travels through the muscle on its way to the posterior thigh muscles. When the piriformis muscle is tight, or hypertonic, it can squeeze the nerve causing irritation and pain. If shooting pain begins at the lumbar spine and travels down the leg, then it may be true sciatica. If the pain begins in the buttocks region, then it is probably piriformis syndrome and will respond well to massage and stretching. If you feel that you may have piriformis syndrome, or any other malady, you should consult a qualified health practitioner, so you may be properly diagnosed.

The gluteus maximus muscle only spans the hip joint and arises from the posterior sacrum and ilium to insert onto the posterior femur just below the greater trochanter and iliotibial band. This muscle functions to extend the hip and rotate the femur laterally. Location of the greater trochanter was shown last month in this column, refer to the figure when referencing other bony structures.

The gluteus medius arises from outer surface of the ilium and is located more laterally, or to the side, than the gluteus maximus. It then inserts on to the lateral surface of the greater trochanter of the femur. The function of this muscle is to abduct the hip joint. Abduction means to move away from the midline, or middle, of the body. Abduction of the hip, is to raise your leg outward, directly to your side. The gluteus medius also acts to stabilize the pelvis during walking and running.

The gluteus minimus originates from the ilium and inserts on to the anterior surface of the greater trochanter. This muscle functions to abduct the hip and to rotate it medially. This muscle lies under and just below the gluteus medius muscle and assists it in stabilizing the pelvis. Medially means toward the midline, or middle, of the body.

The semimembranosus and semitendinosus muscles both arise from the ischial tuberosity and act to extend the hip and flex the knee. Both muscles insert on to the tibia, but on different aspects. Because of these insertion points, these muscles also act to medially rotate the lower leg, when the knee is flexed.

The biceps femoris muscle has two heads and runs down the posterior side of the thigh. The long head of the biceps femoris arises from the ischial tuberosity and inserts on to the head of the fibula. While the short head has the same insertion point, it originates from the lateral side of the femur (lateral lip of linea aspera). Only the long head crosses the hip joint and it acts to extend the hip and flex the knee. While the short head only acts to flex the knee. Also both heads will rotate the lower leg laterally when the knee is flex.

Chronically shortened hamstring muscles (biceps femoris, semimembranosus, semitendinosus) can contribute to lower back pain, knee pain and leg length differences. It can also limit your stride length during walking and running. These are reasons to ensure you maintain a good resting length in your hamstring muscles. Continued stretching during and after exercise will enable your hamstrings to relax and maintain, or increase, your resting length.

The tensor fascia latae (TFL) muscle is a very short muscle with a long tendon attachment. It arises from the iliac spine and inserts onto the tibia. This muscle is at its strongest when performing a combination of hip abduction and flexion. It also acts to stabilize the hip during weight bearing activities. Tightness of this muscle, and other hip abductors, can contribute to pelvic imbalances, which can cause pain in the hips, knee and lower back.

The long tendon attachment of the TFL is called the iliotibial band (ITB). Iliotibial band syndrome is an overuse injury caused by tightness of the ITB rubbing over the lateral femur epicondyle. Often this syndrome is found in cyclist and novice runners who overpronate, or turn their toes inward. The pain is often felt just above the lateral side of the knee and sometimes just below the knee by the tibia, where the ITB inserts. Tightness in the TFL or gluteus medius can cause tightness in the ITB. Another irritator is the vastus lateralis muscle which lies under the ITB and can enlarge, or hypertrophy, and this will cause tightness in the ITB. Often stretching and massage will help relieve symptoms.

On July 20-21, 2001 Tracy Anderson will be guest speaking at a National Sports Medicine Symposium at the Kings Island resort and conference center. The symposium is hosted by Middletown Regional Hospital and is pre-approved for continuing education units for ATC's, PT's, PTA's and OT's, and Continuing Medical Education Credits for Physicians. Parrillo Certified Trainers will earn two CEC's.

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