Tibial Tubercle Transfer

Tibial tubercle transfer, also called bony realignment or osteotomy, is a surgical treatment option for instability, arthritis or cartilage defects affecting the patellofemoral joint (kneecap and femur). During the operation, the orthopedic surgeon moves or transfers by a short distance (1 cm) a small portion of bone where the patella tendon attaches to the tibia (shinbone).

Candidates for tibial tubercle transfer include:

- Patients with patellar instability due to forces that push the kneecap out of its track for whom a soft tissue procedure (such as medial patellofemoral ligament construction) is not appropriate
- Patients with pain due to malalignment of the patella, which results in overload and stress-related cartilage damage in the front of the knee
- Patients with patellofemoral arthritis (also called chondromalacia) and associated cartilage damage

Symptoms of these conditions include a distinct type of stiffness and pain in the front of the knee that is experienced after prolonged periods of sitting, such as on airplane flights or at the theater, or when transitioning from a sit to stand position. Exercises involving squats and lunges, as well as stair climbing and specifically descending can also provoke these symptoms and women may find wearing high heels painful.

Tibial Tubercle Transfer at HSS

At the Patellofemoral Center at the Hospital for Special Surgery (HSS), patients with pain and/or instability undergo a thorough assessment that includes a physical examination and patient history. Magnetic resonance imaging (MRI) is also a part of this evaluation, as it provides critical information on the condition of the cartilage in the patellofemoral joint and helps determine whether the patient is a candidate for tibial tubercle transfer. Often, these images can be obtained on the same day as the initial visit.

Patients undergoing tibial tubercle transfer are given regional anesthesia — a spinal block that numbs the lower half of the body — and sedation. During the operation, the surgeon ensures that the transfer will allow the tendon to guide the patella effectively into the groove on the femur, where the two bones meet in the patellofemoral joint, and that pressure has been decreased from any area where cartilage damage has occurred. In order to maintain the new position of the bone, two screws are placed to secure the bone; screws may be removed at a

later point if they are bothersome to the patient. The incision required to perform the operation is approximately three inches in length and the entire surgery lasts about an hour.

Recovery from Tibial Tubercle Transfer

While recovering from tibial tubercle transfer, it's essential that the bone heal before the patient bears full weight, and patients must use crutches for the first four weeks following surgery. The affected leg remains in a brace while walking. Adhering to these guidelines is critical to the success of the surgery.

Four weeks after the operation, an experienced physical therapist at the Patellofemoral Center at HSS evaluates the patient's progress. Provided that the healing is progressing as anticipated and the quadriceps muscle is sufficiently strong, weight bearing begins at four weeks. Other measures that can help speed recovery from tibial tubercle transfer include devices that provide electric stimulation to the quadriceps muscle and Game Ready®, a machine that compresses and cools the leg, thereby reducing swelling and pain. While recovery rates vary, most patients are able to return to work or school after one to two weeks, resume most forms of gym exercise between three and four months, and can participate in sports at six to nine months after surgery.

Tibial tubercle transfer has a proven record of success in appropriately selected candidates and is generally safe and well-tolerated. Rare complications include potential risk of blood clot, infection and fracture or delayed bone healing. In order to minimize risk smoking must be avoided for a month prior to the operation and for the duration of recovery.