the office of **DR. BETH E. SHUBIN STEIN** M.D.

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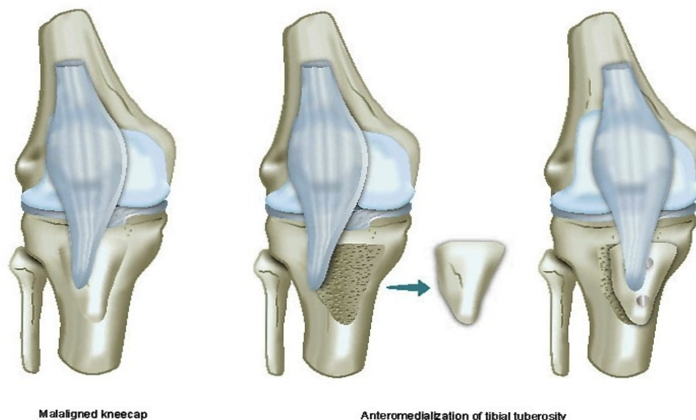
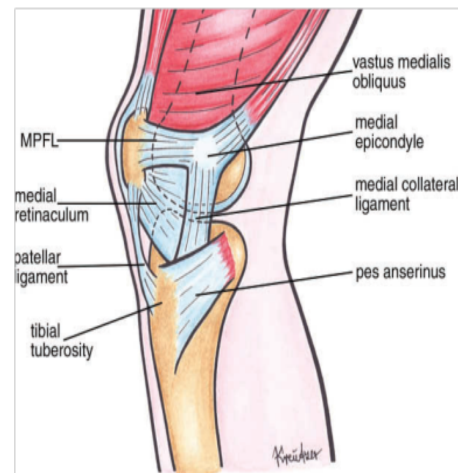
SURGERY SPECIFIC INFORMATION
TTT + MPFL + Cartilage Procedure

Tibial Tubercle Transfer/Osteotomy, Medial Patellofemoral Ligament Reconstruction, and Cartilage Procedure such as Denovo, OCA, Microfracture, or MACI





What makes me a candidate for this surgery?
You are a candidate if you have patellar instability (kneecap dislocation), front knee pain, and focal cartilage injury. This is evaluated through your past history and the use of MRI and XRAY.

What is the medial patellofemoral ligament (MPFL) and how is it damaged?
The MPFL is a ligament that stabilizes the patella (kneecap) and keeps it from displacing laterally. It is disrupted when someone dislocates his/her patella. When the kneecap dislocates towards the outside, this stretches the ligament on the inside of the knee, which is trying to keep the kneecap in place. This can result in either a tear of the MPFL or a detachment of the ligament from the bone.

What is cartilage, why is it important, and how is it injured?
Cartilage is the shiny, smooth coating at the end of bones. It protects the bone and allows the bones to move smoothly and efficiently. Damaged cartilage is known as arthritis. When cartilage thins, or has a piece missing, it puts more stress on the bone and causes pain. The mechanism of injury for a cartilage defect is usually related to trauma, such as a dislocation that causes the cartilage to scrape along bone, or chronic friction from a maligned knee. The body cannot regenerate this type of cartilage.

What does the surgery entail?
A tibial tubercle transfer (also known as a Fulkerson Osteotomy) is a surgical procedure that is used to correct for patellar instability or patellar malalignment. The procedure consists of an incision, which is made a few centimeters below the kneecap (patella) along the top portion of the shin bone (tibia). The patella is embedded in a tendon that inserts on a bony prominence at the shin bone, known as the tibial

tuberosity. The patella is repositioned by surgically cutting and moving the attachment on the shin bone. The new position is held through the use of 2 metal screws.
Then, the injured MPFL ligament will be replaced with a graft, usually a hamstring tendon from the same leg or a cadaver allograft. The graft is attached to the patella via small absorbable screws that hold the graft in place.
Using arthroscopy, the cartilage defect is debrided and restored using one of the methods described below.
The incision is then closed with absorbable sutures and Dermabond, a surgical glue and tape.

How will my cartilage be repaired?
This depends on many factors including your age as well as the size and location of the cartilage defect. The surgeon will chose from one of the following procedures:

- Microfracture
    - Procedure: Using arthroscopy, the surgeon will first remove any defective and damaged cartilage tissue from the knee joint. She will then create small holes at the site of your lesion to allow bleeding which will stimulate healing. The new tissue that grows is a hybrid of fibrocartilage and another type of cartilage that is similar to that originally in the joint. Although it is not exactly the same, this new type of cartilage is shown to be durable and to function similarly to the original articular cartilage.
- DeNovo
    - Procedure: Using arthroscopy, the surgeon will first remove any defective and damaged cartilage tissue from the knee joint. She will then patch the cartilage defect with the DeNovo patch. This consists of baby cartilage which is able to rejuvenate and grow.
    - You may require follow-up MRIs at 3 mo, 6 mo, 12 mo, and 24 mo after surgery.
- OCA (Osteochondral Allograft)
    - Procedure: Using arthroscopy, the surgeon will first remove any defective and damaged cartilage tissue from the knee joint. She will then patch the cartilage defect with OATS plug, allograft donor cartilage. This does not rejuvenate, but is anchored into the bone. The body then grows into the new plug and it becomes your own.
- MACI (autologous cultured chondrocytes on porcine collagen membrane)

    - Procedure: This is a staged surgery. Stage 1- Using arthroscopy, the surgeon will first remove any defective and damaged cartilage tissue from the knee joint. Healthy cartilage is biopsied and sent to a lab where the cartilage cells will proliferate. Stage 2- About 4-6 weeks later, the defect will be patched with your new cartilage cells.

How long will I stay in the hospital?
With this surgery, you will stay overnight. This will allow for better management of your pain. Once you are able to demonstrate successful management of pain, you will be discharged home.

What are the possible risks and complications of surgery?
As with any surgery there is a risk of DVT, nerve damage, and postoperative infection. Specific risks and complications include but aren't limited to failure to heal, fracture, and hardware complications.

When can I drive?
You may not drive while taking pain medication. In addition, if it is your right knee that had surgery, you will not be able to drive for approximately 6 weeks after surgery or until the brace is removed.

When can I resume jogging?
You will not resume jogging until cleared by your physician. This typically is around 8-10 months after surgery. You will be allowed to begin biking without resistance once you have adequate range of motion and will begin this with your physical therapist. Once adequate quad strength is demonstrated you will transition to the Elliptical, then running is the next step after that.

When can I return to my sport?
There are many factors in returning to sport after surgery. Most patients are able to return around 7-10 months after surgery. Please see "Physical Therapy" below for more information.

Will I need to be on blood thinners after surgery?
Often, patients are put on Aspirin, but depending on your risk factors, you may have a different medication. This is to prevent blood clots.

What is the recovery period like?

- Brace
    - You will wear a long brace on your leg, known as a Bledsoe brace, and use crutches. You will wear it day and night, locked straight for 6 weeks.
        - While resting, it is ok to remove brace. However, brace must be worn while sleeping or ambulating.
    - If you are a patient of Dr. Shubin Stein, you will fitted for the smaller brace at 6 weeks, transition to its use typically around 8-10 weeks, and continue its use until you have regained quadriceps strength. This will be determined by your Physical Therapist and typically occurs around the 3-5 month mark.
- Weight bearing precautions
    - Immediately after surgery you will have crutches with the Bledsoe brace locked straight. You will not be able to put any weight on the surgical leg for the first 4 weeks.
    - At the HSS PT evaluation, you will coached how to progressively start to bear weight. This is a slow and gradual process and takes about 2 weeks to get back to full weight bearing. The first day, you will take on about 20lbs of your body weight and stay at this weight for 2 days. As long as you do not experience pain, you may increase your weight bearing load by about 20lbs every other day, until full weight bearing status is achieved. Continue to use the crutches for another 2-3 days before discontinuing use. If pain is ever experienced during this process, return to the previous pain-free weight.
    - At the 6 week post-op visit, you will have x-rays to assess bony healing.
- Continuous Passive Movement (CPM): 2 hrs/day x 6wks
    - This device moves your leg for you to increase range of motion, and bathes the joint in rejuvenating synovial fluid. Remove your brace for this exercise.
        - Start 0-45 and increase to 0-60. You should be at 60◦ at your first post-op visit.
        - Continue to increase to 0-90, you should reach this by 6 weeks.
- Kneehab (quad stimulator)
    - The quadriceps muscle will become very weak and atrophied following surgery. To limit and prevent the extent of this disuse weakness, you will use the kneehab quad stimulator. This consists of a neoprene sleeve with electrodes that stimulates the quadriceps muscle to keep it in shape.
        - Use for 20 minutes twice daily for 6 months
        - Device will be delivered to your home or given to you at your first post op visit.
- Bonestim
    - The bone stimulator is critical to recovery and is non-negotiable. Should insurance fail to cover the device, it is necessary to work out a payment plan. This is an ultrasound machine which encourages the body to create new bone cells. You will feel nothing to minimal tingling during administration of this device.
        - Use for 20 minutes once daily for 6 months
        - Place the electrodes next to the incision. Do not directly apply to incision.
        - Device will be delivered to your home or given to you at your first post op visit.
- Vitamins
    - Since bone is cut and repositioned during the surgery, the bone now has to heal, much like after any broken bone. To ensure the best environment for the bone to recovery, you should begin the following vitamin supplementation following surgery for 6 months:
        - 4,000 international units of over the counter vitamin D2 or D3 once daily
        - 1000mg Calcium once daily

How will my pain be managed?

- Cryotherapy to prevent post-op swelling and inflammation
  - The ice machine may be covered by insurance, depending on your insurance plan
- Pain Medication. See POST-OP PAIN MANAGEMENT handout for details regarding medications.

When will I start Physical Therapy?

- Physical Therapy
  - The first 6 weeks after surgery, you will do home exercises, no formal PT sessions.
    - Quad sets : 3 sets performed three times a daily.
      - Sit or lie on your back with leg straight. Tighten your quadriceps muscle on the front of the thigh. Hold for 3 seconds, relax. Repeat x 10.
    - Heel pumps: 3 sets preformed three times daily.
      - Sit or lie on your back with leg straight. Bend your foot up and down at your ankle joint, pumping the foot. Complete 10 pumps.
    - Range of Motion: 5-10 minutes, three times daily.
      - While seated, surgical leg should be straight in front of you. Use your unaffected lef to cradle the surgical leg. Actively use the unaffected leg to bend both knees.
  - 1x session at HSS Sports and Performance to evaluate progress, start weight bearing, and provide home exercises. This is scheduled at 2wks for Strickland patients, and 4 wks for Shubin Stein patients. Call 212-606-1005 to schedule with PT Theresa, Sarah, Jess, or Julie.
  - At 6 weeks you will start formal PT. You will go 2x/week for 6-9 months.
    - Dedication and attendance to your sessions are critical to your recovery.
  - Return to Play Assessment
    - This is a specific evaluation that is performed by HSS Sports and Performance center. It is a two part evaluation; the first part is at post-op month 5-6 and is to demonstrate specific areas that need continued work. You will then be given a detailed program to increase strength in specific areas. The second part is 6-8 weeks later to determine your readiness to return to sport. The two part evaluation costs $300 and is typically not covered by insurance.

Will I be able to remove the screws?

You don't have to remove the screws, however, if you would like to, the procedure is done after the osteotomy is well-healed, typically around the 4-5 month mark. This is a simple same-day procedure done in the OR. The surgeon makes a small incision using the same healed incision from the first surgery. She then packs the hole where the screw was located.

INSTRUCTIONS FOR IMMEDIATELY AFTER SURGERY:

- Activity
  - Apply ice to your knee but keep the bandages dry
  - Elevate your leg on 2-3 pillows or rolled up towels placed under the **<u>heel</u>** so that the heel is elevated higher than your knee. This will help reduce swelling and achieve full extension of the knee. **Avoid pillows under the knee.**
  - For the first 1-2 weeks after surgery, the **most important goal is to regain the ability to fully straighten the knee**.
  - Start your home exercise program and follow weight bearing precautions.
- Bandage and Incision Care
  - Under your brace is an ace wrap- leave this ace wrap on for the first 2 days. You may then remove the ace wrap. Underneath will be several waterproof bandaids. Keep these bandaids in place. However, if the bandaids become wet, dirty, or start to peel off, then replace with Nexcare waterproof bandaids. Under the bandaids is Dermabond, this is a surgical glue and tape that is used in conjunction with absorbable sutures to close the incision. Do not touch the Dermabond.
  - You may re-apply the ace wrap as this helps to decrease swelling.
  - Do not apply creams, ointment or lotions to your incisions for at least 4 weeks.
- Showering
  - You may shower after you have removed the ace wrap. Although the bandaids are waterproof, you should wrap the leg in saran wrap to provide an extra waterproof layer.
  - You must wear the brace and be seated in the shower.
  - **Do not get the incision or brace wet**, however, you must wear the brace when standing. You should use a shower chair, or if you have a bathtub-shower, you can sit in the tub. If you take a bath, keep the leg out of the bath. The leg should not be submerged.
- Pain Management
  - See <u>POST-OP PAIN MANAGEMENT</u> handout. Around 2-3 weeks out, you should only be taking the pain medication at night and after strenuous activity as needed.
- Normal sensations after surgery
  - Pain
  - Swelling and warmth up to 2 weeks
  - Small amounts of bloody drainage for first few days
  - Numbness around the incision area
  - Bruising
  - Low grade temperature less than 101.0 for up to a week after surgery.
  - Small amount of redness to the area where the sutures insert in the skin
- **IF ANY OF THE FOLLOWING OCCUR, CONTACT THE OFFICE IMMEDIATELY**
  - Calf pain or ankle swelling in either leg
  - Change is noted to your incision (i.e. increased redness or drainage)
  - Temperature greater than 101.0
  - Fever, chills, nausea, vomiting or diarrhea
  - Sutures become loose or fall out and incision becomes open
  - Drainage becomes yellow, puss like or foul smelling
  - Increased pain unrelieved by medication or measures mentioned above.
- Post-op visit
  - Please ensure that you have a post-op visit scheduled for 7-14 days after surgery. Please arrive 30-45 minutes prior to your appointment time to obtain X-rays.