

Microfracture Technique

General Information:

The intent of these guidelines is to provide the therapist with direction for the postoperative rehabilitation course of a patient that has undergone an ACL reconstruction & Meniscal Repair. It is not intended to be a substitute for appropriate clinical decision-making regarding the progression of a patient's post-operative course. The actual post surgical physical therapy management must be based on the surgical approach, physical exam/findings, individual progress, and/or the presence of post-operative complications. If a therapist requires assistance in the progression of a post-operative patient they should consult with the orthopedic surgeon.

The microfracture procedure is done **arthroscopically**. The surgeon visually assesses the defect and performs the procedure using special instruments that are inserted through three small incisions on the knee. After assessing the cartilage damage, any unstable cartilage is removed from the exposed bone. The surrounding rim of remaining articular cartilage is also checked for loose or marginally attached cartilage. This loose cartilage is also removed so that there is a stable edge of cartilage surrounding the defect. The process of thoroughly cleaning and preparing the defect is essential for optimum results. Multiple holes, or **microfractures**, are then made in the exposed bone about 3 to 4mm apart. Bone marrow cells and blood from the holes combine to form a "super clot" that completely covers the damaged area. This marrow-rich clot is the basis for the new tissue formation. The microfracture technique produces a rough bone surface that the clot adheres to more easily. This clot eventually matures into firm repair tissue that becomes smooth and durable. Since this maturing process is gradual, it usually takes two to six months after the procedure for the patient to experience improvement in the pain and function of the knee. Improvement is likely to continue for about 2 to 3 years.

The rehabilitation program after microfracture is crucial to optimize the success of the surgical technique. The program is designed to promote the ideal physical environment in which the bone marrow cells can transition into the appropriate cartilage-like cell lines. When the ideal physical environment is combined with the ideal chemical environment produced by the marrow clot, a repair cartilage can develop that fills the original defect.

The specific rehabilitation program for each patient following a microfracture will vary depending upon the following factors:

- The location of the defect
- The size of the defect
- Whether any other surgical procedure, such as an anterior cruciate ligament reconstruction, was done at the same time as microfracture

Rehabilitation Guidelines: Femoral or Tibial Chondral Defects

- If a CPM machine is not used, the patient begins passive **flexion/extension** (straightening and bending) of the knee with 500 repetitions three times a day.
- **The use of crutches, with only light touch-down weight allowed on the involved leg, is prescribed for 6 to 8 weeks.** Patients with small defect areas (less than 1cm in diameter) may be allowed to put weight on the leg a few weeks sooner.
- Brace use is rarely recommended for patients with chondral defects on the femur or tibia.

Limited strength training also begins immediately after microfracture surgery.

- Standing one-third knee bends with a great deal of the weight on the uninjured leg begin the day after surgery.
- Stationary biking without resistance and a deep-water exercise program begin 1 to 2 weeks after surgery.
- **After 8 weeks the patient progresses to full weight bearing and begins a more vigorous program of active knee motion.**
- Elastic resistance cord exercises can begin about 8 weeks following surgery.

- Free weights or machine weights can be started when the early goals of the rehabilitation program have been met, but no sooner than 16 weeks after surgery.
- **Patients must not resume sports that involve pivoting, cutting, and jumping for 4 to 6 months after a microfracture procedure.** Full activity may be resumed once the physician has examined the knee and given approval for the patient to return to sports activity.

Rehabilitation Guidelines: Patellofemoral Chondral Defects

- **All patients treated with microfracture for patellofemoral defects must use a brace set for 0° to 20° of flexion for at least 8 weeks.** It is essential to limit compression of the new surfaces in the early postoperative period, so that the maturing marrow clot will not be disturbed. The brace should be worn at all times except when passive motion is allowed.
- When the patient wears a brace, strength training is allowed, but only in the 0° to 20° range immediately after surgery in order to limit compression of the affected chondral surfaces. The joint angles of these patients are observed carefully at the time of surgery to determine where the defect makes contact with the opposing surface, either on the patella or on the trochlear groove of the femur. **These areas are avoided during strength training for approximately 4 months.**
- Patients are allowed to put weight on the involved leg as tolerated, but it must be **limited to the angles of flexion that do not compress the treated surfaces.** For this reason the patient must wear a brace locked in limited flexion.
- After 8 weeks, the knee brace is gradually opened to allow increased flexion of the knee, a process that takes about a month. Brace use is generally discontinued at about 12 weeks. Some patients, however, like to continue to wear the brace for strenuous exercise for a few more months up to about 6 months.
- After brace use is discontinued, strength training advances progressively.
- **The doctor must examine the knee before the patient is released to full activity.**

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