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Brace-Free Rehabilitation Protocol for Anterior Cruciate Ligament Reconstruction Using Double-Looped Semitendinosus and Gracilis Tendon Graft (DLSTG) and Tibialis Allograft

by Stephen M. Howell, M.D.

Goal

To restore range-of motion (ROM), strength, and confidence to the knee while protecting the anterior cruciate ligament (ACL) graft from stretching or rupturing.

Facts

1. Transformation of the graft into a strong and durable ligament requires 4 months.
2. A graft that stretches or ruptures during this time period it is not repairable.
3. Following this protocol must be followed to prevent injury to the ACL graft.
4. Any deviation from this regimen may unnecessarily compromise your final result.

Reminder

When you and I agreed to reconstruct your torn ACL you willingly committed yourself to a four month, vigorous, structured, rehabilitation program. You must understand that the end-result depends to a great extent on your discipline, motivation, and perseverance in performing the exercise program. Without your commitment and energy, the surgery is assured to fail to meet your expectations. With your cooperation and dedication you have an excellent chance to regain the strength, stability, and confidence in your knee that you had before your injury.

Many patients are too busy with the demands of work and family to participate in formal physical therapy requiring regular attendance at inconvenient times during the day. Fortunately, in the majority of cases, rehabilitation can be done at home, at the health club, or while traveling in a hotel gym using a stationary bicycle, pool, and exercise equipment. The following exercise program should be followed **daily on your own** to achieve the goals expected at the end of each time interval. This detailed protocol has been designed as a reference specifically for you, and your trainer or physical therapist.

Timing of Three Follow-Up Visits

1. WEEK 2
2. WEEK 8
3. WEEK 16 (X-rays prior to visit: single-leg hop test)

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We are going to carefully monitor your progress at each of these visits and provide you with clear goals that you should strive to accomplish by the next visit.

Your Rehabilitation Program

Week 0-2

1. **WEIGHT BEARING:** Bear weight on the operated leg as tolerated and use your crutches as needed. Crutches may be discarded when the knee is comfortable enough to walk on.
2. **RANGE OF MOTION:** Regain motion using towel extension flexion and extension exercises and prone stretching. You should be able to freely move your knee from **0 to 90 degrees by 10-14 days after surgery.**
3. **STRENGTHENING:** None
4. **WOUND CARE:** You may shower 48 hours after surgery if there is no drainage from the wounds. If drainage does occur keep the wound dry and covered. If it doesn't stop within 5 days of surgery call the office. Do not soak the knee in a bathtub, hot tub, or swimming pool until after the staples are removed. Bruises that appear down the leg and into the calf and foot 3 to 7 days after the operation are normal.
5. **GOAL:** By two weeks the knee should move from 0 to 90 degrees and will still be sore, stiff, swollen, and bruised. You should feel ready to go to the gym.

Week 2-8

1. **WEIGHT BEARING:** You should walk without crutches.
2. **RANGE OF MOTION:** Continue to regain motion using towel extension flexion and extension exercises and prone stretching.
3. **STRENGTHENING:** Start walking, swimming, biking, and going to the gym or health club. On the bike, begin with the seat elevated without resistance on the wheel. Lower the seat as motion increases and add resistance as tolerated. Try to bicycle twice a day for 10 to 15 minutes. Once you are comfortable on the bike you may use any other exercise machine. Use low weight/high repetitions (25 reps/3 sets) when using weight machines. Skip exercises that cause swelling, pain, and limitation of motion in the knee; focus on those that don't.
4. **GOAL:** By eight weeks the range of motion of the reconstructed knee should equal the other knee. Slight fluid or swelling may persist. Your knee should feel well enough to resume light jogging, golf, shooting baskets, and agility training (i.e. forward and backward running, and sideways running or cross-over drills).

Week 8-16

1. **STRENGTHENING:** Continue to use any exercise equipment available to you in your home, gym, and health club. Increase the weight and resistance on the exercise machines. It's safe to run on a level surface; increase the distance first and then the speed.
2. **GOAL:** By 16 weeks the knee should feel well enough to resume full unrestricted activities and sports including tennis, racquet ball, football, baseball, softball, basketball, soccer, wrestling, volleyball, skating, boxing, and water and snow skiing.

Final Evaluation at 16 Weeks

1. **CLINICAL EVALUATION:** Activity level, hardware symptoms, level of pain, fluid, motion, thigh circumference, and stability will be measured and assessed.

2. **RADIOGRAPHIC EVALUATION:** Hand-carry the radiographs we ordered of your knee. The placement of the tunnels and fixation devices will be reviewed with you.
3. **ACTIVITY EVALUATION:** Practice doing a single-leg broad jump on each leg before the visit. We will average the distance of three jumps performed on each leg. A good score is when the average distance jumped by the leg with the reconstructed knee is 85% or better
4. **COMMENT:** If the knee is stable, pain and swelling are minimal and the leg is strong then full return to work and sports are permitted. Restoring confidence in your knee may take six months to and requires use of the knee in the sport that you desire to return to.

Answers to Common Questions

How long will I be in the hospital?

Surgery is performed as an outpatient. Patients go home 4-5 hours after surgery after walking with crutches. If you have your own crutches please bring them to the hospital with you.

How long does the surgery take to perform?

The surgery usually requires 30-40 minutes to perform. Repairing or removing a torn meniscus adds another 15-20 minutes.

When can I drive a car?

You may resume driving when you feel safe and confident behind the wheel, which may take 1-2 week or longer. Do not drive when taking pain pills.

When can I return to work or school?

Motivated people who sit or have a desk job can usually return to work 7-10 days after surgery. Construction workers require 2 to 4 months depending on the demands of the job.

What is the success rate of the surgery?

The success depends on the extent of any other damage to the knee at the time of ACL reconstruction such as meniscal tears, articular cartilage injury, arthritis, and other ligament tears. Approximately 95% of patients with a tear of just the ACL and no other injuries can return to full unrestricted activities without any brace.

Can I re-injure the graft?

Yes re-injury is possible. Remember that you tore your own natural ligament, so it is theoretically possible to rupture your graft. Fortunately, rupture of the graft is uncommon. You are just as likely to tear the ACL in the other knee than to re-tear your reconstructed ligament.