

The Effects of Pre- and Post-Rehabilitation Physical Training Protocol on Anterior Cruciate Ligament (ACL) Progress

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ABSTRACT

CASE HISTORY: A 32-year old male presented a left anterior cruciate ligament (ACL) tear. Past history revealed a right ACL reconstruction which happened ten years earlier. The left ACL injury occurred during soccer while pivoting under normal climate conditions and was a non-contact injury. He reported a lack of stability and localized lateral knee pain. The patient was advised and agreed on participating in 6 weeks of pre-surgical rehabilitation. The patient used cryotherapy modalities for pain and inflammation control; there was no use of medication. The patient underwent ACL reconstruction with a hamstring tendon graft in Brazil followed by post-operative rehab protocol. **PHYSICAL EXAM:** Prior to surgery, tests and measures included active and passive range of motion (AROM- PROM) involving knee flexion and extension which were within normal limits (WNL), manual muscle test (MMT) was grossly within WNL, palpation presented tenderness at lateral condyle, circumferential measurements were WNL, joint accessory mobility demonstrated notable joint laxity, and Lachman's test was positive for instability. Functional testing included single leg stance was considered fair, body weight squat was considered compensated, and gait assessment illustrated an apprehensive loading response. **DIFFERENTIAL DIAGNOSES:** Medial collateral ligament (MCL) tear; lateral collateral ligament (LCL) tear; meniscus tear (bilateral); lateral hamstring tendon strain; lateral gastrocnemius strain. **TESTS & RESULTS:** The patient had magnetic resonance imagery (MRI) confirming ACL tear and tibial plateau contusion. **FINAL DIAGNOSIS:** ACL grade 3 sprain and tibial contusion. **DISCUSSION:** An estimated 80,000 to 100,000 ACL injuries occur annually, with approximately 70-75% being non-contact injuries. ACL tear severity is distinguished by Grade 1, a mild tear; Grade 2, a moderate tear; and Grade 3, complete rupture. A tibial contusion is common with ACL detachment. The location of the injury has also been demonstrated to be more frequent in the lateral compartment of the joint (lateral femoral condyle and lateral tibial plateau). A tibial contusion is associated with ACL tears in approximately 70% of cases. Rehabilitation following ACL reconstruction takes an average of six months but may take longer. A faster return to sport/activity depends on personal goals and adherence to rehabilitation protocol. **OUTCOME OF THE CASE:** Patient underwent ACL reconstruction using a hamstring tendon graft in Brazil followed by immediate rehabilitation protocol in Florida. **RETURN TO ACTIVITY AND FURTHER FOLLOW-UP:** Patient participates in treatment sessions three days per week, six-weeks post-operation. Patient adheres to home exercise program (HEP), emphasizing quadriceps re-education, AROM, PROM, and flexibility. Despite setbacks including medial hamstring tendinopathy and mild patellar tendonitis, the patient has been very compliant with his protocol making his case significant. The patient is transitioning from the stability phase to the strengthening phase, due to being introduced to more advanced proprioceptive/balance exercises in earlier phases. The patient is remarkably progressing ahead of schedule due to his adherence and inclination with all aspects of the rehabilitation protocol; achieving full ROM with minimal inflammation. Estimated return to prior level of function is five months, which is a month earlier than the average return times.