

## CASE REPORT

## HIGH REPETITION JUMP TRAINING COUPLED WITH BODY WEIGHT SUPPORT IN A PATIENT WITH KNEE PAIN AND PRIOR HISTORY OF ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A CASE REPORT

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## ABSTRACT

**Background and Purpose:** Patients frequently experience long-term deficits in functional activity following anterior cruciate ligament reconstruction, and commonly present with decreased confidence and poor weight acceptance in the surgical knee. Adaptation of neuromuscular behaviors may be possible through plyometric training. Body weight support decreases intensity of landing sufficiently to allow increased training repetition. The purpose of this case report is to report the outcomes of a subject with a previous history of anterior cruciate ligament (ACL) reconstruction treated with high repetition jump training coupled with body weight support (BWS) as a primary intervention strategy.

**Case Description:** A 23-year old female, who had right ACL reconstruction seven years prior, presented with anterior knee pain and effusion following initiation of a running program. Following visual assessment of poor mechanics in single leg closed chain activities, landing mechanics were assessed using 3-D motion analysis of single leg landing off a 20 cm box. She then participated in an eight-week plyometric training program using a custom-designed body weight support system. The International Knee Documentation Committee Subjective Knee Form (IKDC) and the ACL-Return to Sport Index (ACL-RSI) were administered at the start and end of treatment as well as at follow-up testing.

**Outcomes:** The subject's IKDC and ACL-RSI scores increased with training from 68% and 43% to 90% and 84%, respectively, and were retained at follow-up testing. Peak knee and hip flexion angles during landing increased from 47° and 53° to 72° and 80° respectively. Vertical ground reaction forces in landing decreased with training from 3.8 N/kg to 3.2 N/kg. All changes were retained two months following completion of training.

**Discussion:** The subject experienced meaningful changes in overall function. Retention of mechanical changes suggests that her new landing strategy had become a habitual pattern. Success with high volume plyometric training is possible when using BWS. Clinical investigation into the efficacy of body weight support as a training mechanism is needed.

**Level of Evidence:** Level 4 – Case Report

**Keywords:** ACL-RSI, biomechanics, IKDC, plyometrics, training volume

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**Disclosures:** The University of Montana has submitted a patent associated with the intellectual property of the body weight support system described in this manuscript.