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A comparison of acute and chronic anterior cruciate ligament reconstruction using LARS artificial ligaments: a randomized prospective study with a 5-year follow-up

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Abstract
Purpose This prospective randomized study compared acute and chronic anterior cruciate ligament (ACL) reconstruction using ligament advanced reinforcement system (LARS) artificial ligament in young active adults with a 5-year follow-up.
Methods Fifty-five patients were enrolled in this study and divided into two groups based on the elapsed time between the injury and reconstruction: the acute group (3–7 weeks) and the chronic group (6–11 months). The clinical outcomes were evaluated using the Lysholm knee scoring scale, the Tegner activity rating, a KT-1000 Arthrometer, and the International Knee Documentation Committee (IKDC) scoring system. Isokinetic strength of the quadriceps and hamstring was assessed using the Biodex System 3 isokinetic dynamometer.
Results Anterior laxity was decreased and quadriceps/hamstring muscle strength was increased in the acute group compared to the chronic group ($p > 0.05$). There were no statistically significant differences in Lysholm scores, Tegner activity scores, and the IKDC evaluation form between the two groups.
Conclusions These results suggest that earlier ACL reconstruction using a LARS artificial ligament may provide an advantage in the treatment and rehabilitation of ACL rupture.

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Introduction

The anterior cruciate ligament (ACL) is the primary structure that provides knee joint stability. The function of the ACL is to limit excessive anterior displacement during movement. Thus, an ACL rupture can lead to instability and increased abrasion of the knee joint, a higher probability of meniscus injury, and future arthritis.

An ACL rupture is a common sports injury, especially in an otherwise healthy population of active young people. However, the benefits of early or delayed ACL reconstruction, and the optimal time interval between injury and repair remain controversial [1–7]. Noyes et al. [4] concluded that patients with acute injury experience less pain and fewer limitations than chronic cases, and they emphasized the need for earlier reconstruction and joint stabilization in active persons. Cipolla et al. [3] suggested that the "ideal" time for an ACL reconstruction is during the 3–6 weeks after the initial injury, and that patients should follow a well-planned program of exercises to strengthen the quadriceps and hamstrings before surgery. In contrast, Wasilewski et al. [1] reported that knee recovery after acute ACL reconstruction (performed within 1 month after injury) is significantly slower than after chronic reconstruction. Other studies [2, 6] indicate that there are minimal differences in outcome when comparing early and delayed ACL reconstruction. One [2] recommendation is that arthroscopic ACL reconstruction should be performed within 6 weeks of the primary knee injury, as delayed treatment may predispose patients to cartilage lesions and meniscal tears.