

Minimally Invasive Medial Collateral Ligament Reconstruction Using Achilles Tendon Allograft

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■ ABSTRACT

Medial collateral ligament (MCL) reconstruction is indicated for patients with symptomatic valgus instability and excessive medial compartment opening secondary to a chronic high-grade MCL injury who have failed nonoperative treatment. The purpose of this article is to detail a minimally invasive technique using an Achilles tendon allograft to reconstruct the chronically deficient MCL.

Keywords: knee, MCL, reconstruction, valgus instability, Achilles tendon allograft

■ HISTORICAL PERSPECTIVE

The current consensus for the treatment of isolated medial collateral ligament (MCL) tears is nonoperative, including early range-of-motion exercises and bracing to prevent recurrent instability during healing.^{1,2} There is clinical³ and basic science^{4,5} evidence demonstrating the healing capacity of the MCL. Medial collateral ligament injuries are classified according to the amount of medial joint opening when a valgus stress is applied at 30 degrees of flexion: 3 to 5 mm, grade 1; 5 to 10 mm, grade 2; greater than 10 mm, grade 3. High-grade MCL injuries (ie, grade 2 or 3), however, rarely occur as isolated events. Nearly 80% of grade 3 MCL injuries occur with a concomitant ligamentous injury, with the anterior cruciate ligament most often involved.⁶

In the context of multiple ligament-injured knees, the MCL healing process is much more complex and may be impacted by the functional loss of the other ligaments,⁷ predisposing to chronic MCL insufficiency. Previous techniques for MCL repair have included the manipulation of the ligament insertion,⁸ tendon transfers,⁹ and free autologous¹⁰ and allogeneic¹¹ tendon re-

constructions. The purpose of this article is to detail a minimally invasive technique using an Achilles tendon allograft to reconstruct the chronically deficient MCL.

■ INDICATIONS AND CONTRAINDICATIONS

The controversial need for surgical reconstruction requires that the patient demonstrates a functionally high-demand activity level. The ideal candidates are generally young, otherwise healthy patients who are active in competitive sports and complain of significant medial-sided laxity; however, any patient with persistent high-grade valgus instability who has failed nonoperative treatment may be a potential surgical candidate. Such patients often complain of valgus instability interfering with even basic activities of daily living.

The MCL reconstruction is indicated for patients with symptomatic instability and excessive medial joint opening secondary to a chronic high-grade MCL injury. Clinically, this can be detected with a valgus stress to the affected knee and appreciated by the lack of a firm end point to the stress. Instability should be evaluated in both 0 and 30 degrees of flexion. Most patients with symptomatic instability will demonstrate opening to valgus stress in full extension. If necessary, an office fluoroscan device or stress plain radiographs can be used to confirm medial opening and measure medial compartment widening. In multiple ligament-injured knees, it may be difficult to determine the neutral point and the degree of valgus and varus opening.

Allograft reconstruction is an attractive surgical option for patients with chronic MCL deficiency. Most cases of acute MCL injuries are treated nonoperatively, although early repair may be considered in multiligament injuries or distal avulsions of the superficial portion of the MCL with proximal retraction.

Overall lower extremity alignment should also be evaluated, and if abnormal, a standing long-leg alignment plain radiograph should be obtained. Patients with

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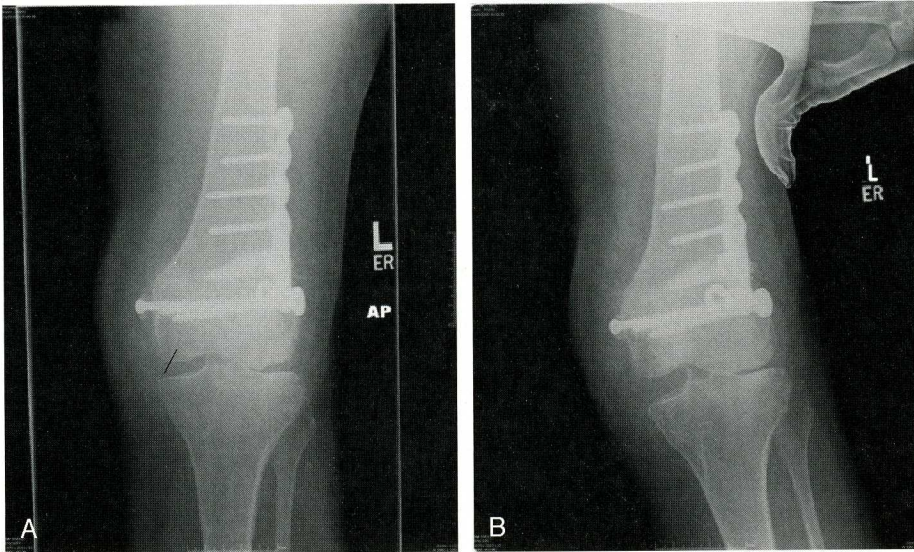


FIGURE 1. Anteroposterior plain radiographs at 0 degrees of flexion without (A) and with (B) valgus stress. Note that this patient had undergone a previous distal femoral osteotomy, anterior cruciate ligament reconstruction, and delayed MCL primary repair after a fracture/dislocation sustained in a skiing accident. The primary complaint was persistent valgus instability, as demonstrated (B), consistent with chronic MCL insufficiency.

overall varus alignment may tolerate valgus instability. Conversely, patients with overall valgus alignment may demonstrate increased symptoms of medial laxity, and in severe cases, concomitant distal femoral osteotomy should be considered.

Contraindications to the procedure include significant degenerative changes of either the medial or the lateral compartment, concomitant ligamentous instability unless addressed at the time of surgery, ongoing active infection, and significant medical comorbidities that preclude

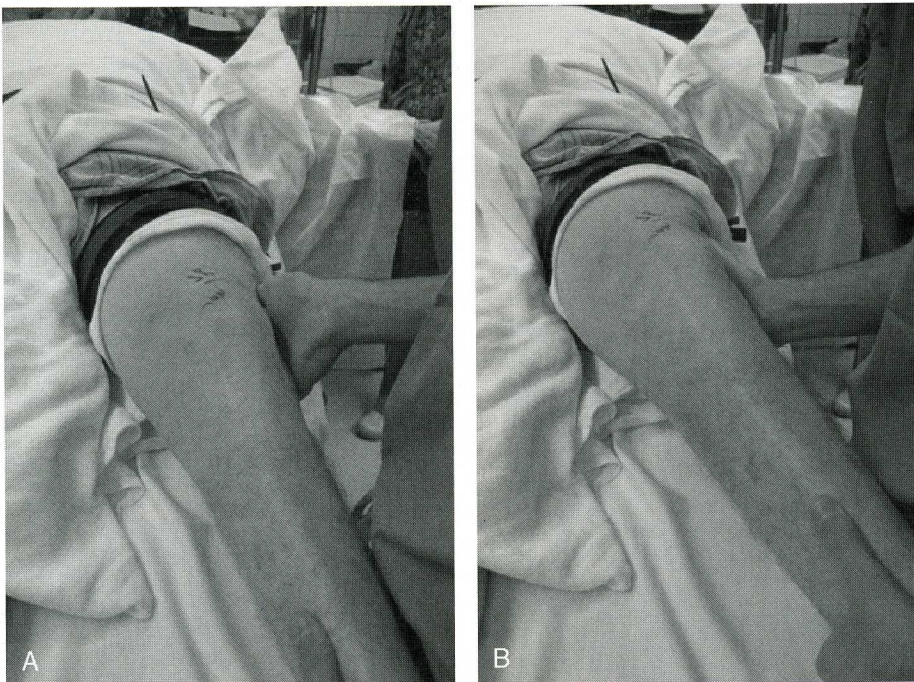


FIGURE 2. Examination under anesthesia without (A) and with (B) valgus stress applied, demonstrating instability consistent with MCL insufficiency.

