

Autoplasty of the Anterior Cruciate Ligament using the “All Inside” Method Using M. Tendons. Semitendinosus and M. Semimembranosus

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Annotation: Restoring damaged ligaments in the knee joint is a significant challenge for traumatologists and orthopedists. Arthroscopic restoration of the anterior cruciate ligament (ACL) is particularly crucial due to its high frequency of injuries compared to other knee ligaments. Various implants and biodegradable screws are commonly used for ACL restoration, but they can lead to complications such as femoral channel fractures, implant migration, and difficulty in creating the anatomical attachment point for the ACL. In our study, we successfully performed arthroscopic restoration of the ACL using the "all inside" method in 190 patients with Ultrabutton Arthrex, which demonstrated simplicity and absence of the aforementioned complications.

Keywords: ACL restoration, Ultrabutton Arthrex, knee joint instability, all inside method.

Objective: The objective of this study was to establish a stable, reliable, minimally invasive surgical treatment using the "all inside" method for anterior cruciate ligament damage, utilizing the tendons of the gracilis, semitendinosus, and/or long fibular muscle with Ultrabutton Arthrex. Injuries to the ligaments of the knee joint occupy the first place in frequency and account for 50 to 75% of all injuries to the knee joint area [1,3,8]. The main contingent of patients with anterior cruciate ligament (ACL) injuries are young people of working age, leading a physically active lifestyle, engaged in sports. Currently, the most optimal method of treating fresh and long-standing injuries of the ligamentous apparatus of the knee joint is operative [2,3,6].

The introduction of arthroscopic technologies and modern implants into a wide clinical practice currently allows us to offer the most effective methods of surgical treatment for knee joint instability, as well as to approach the treatment of such patients differentially, using different methods of surgical treatment depending on the requirements of patients for their future lifestyle [2,5]. Despite the successes achieved in recent decades in knee reconstructive surgery, currently from 15% to 25% of patients suffer from instability and (or) pain after reconstructive plastic surgery of the anterior cruciate ligament [1,4,7]. Subsequently, this inevitably leads to the development of osteoarthritis of the knee joint [4,9].

The purpose of the study. Stable, reliable minimally invasive surgical treatment for damage to the anterior cruciate ligament using the "all inside" method using the tendons of the thin and semi-tendon muscles and (or) the tendon of the long fibular muscle using Ultrabutton Arthrex.

Materials and methods. This study was conducted at the Samarkand Branch of the Republican Scientific and Practical Medical Center of Traumatology and Orthopedics, involving 195 patients with anterior cruciate ligament injuries from 2022 to 2024. The patients' age ranged from 18 to 42 years, including 173 men (89.4%) and 22 women (10.6%). All patients underwent arthroscopic restoration of the anterior cruciate ligament using the "all inside" method with the tendons of the gracilis, semitendinosus, and/or long fibular muscle. Preoperative planning involved assessing joint instability through clinical examinations and magnetic resonance imaging (MRI). Of the patients, 174 presented concomitant meniscal and lateral ligament injuries, while 21 had isolated ACL rupture. Autografts

using the tendons of the gracilis and semitendinosus were employed in 187 patients, while the tendons of the long fibular muscle were used in 8 patients. Transplants were fixed using Ultrabutton Arthrex on the femoral canal and biodegradable Arthrex implants on the tibial canal(Figure 1).



Figure 1 Ultra Button Arthrex

The advantages of this fixation technique are as follows:

1. When fixing the Ultra button, the femoral canal is created at the site of anatomical attachment of the anterior cruciate ligament.
2. A possible fracture of the lower wall of the canal in the femur is excluded, which sometimes occurs when fixing with interference screws.
3. The migration of the implant and getting into the joint cavities is excluded.
4. It is easy to perform, and also the fixation will be reliable.

The average length of the femoral canal during its formation from the medial port was 20 (+5) mm, the average length of the tibial canal was 50 ± 5 mm. The diameter of the femoral and tibial canals was 8.5 ± 1.0 mm. The average length of the graft from the tendons of the thin and semi-tendon muscles and (or) the tendon of the long fibular muscle was 105 ± 15 mm.

Research results:

Studied in 195 patients on the Lysholm scale.

Excellent results – 73 (37,4%)

Good results - 111 (57.4%) and

Satisfactory – 10 (5,2%)

The results were evaluated based on the Lysholm scale, with 73 patients (37.4%) achieving excellent results, 111 patients (57.4%) attaining good results, and 11 patients (5.2%) reporting satisfactory outcomes. Within one year after surgery, 10 patients (5.2%) experienced mild stiffness and discomfort in the joint, which improved over time through rehabilitation programs involving physical therapy, physiotherapy, chondroprotective courses, and intra-articular injections of synovial fluid protectors.

Conclusions.

Autografts using the tendons of the popliteal hip flexors proved successful in restoring knee joint stability with damaged anterior ligaments, both in acute and chronic cases. This technique effectively minimizes complications, particularly issues related to stiffness and patellar pain. The presented experience highlights the importance of a differentiated approach to surgical treatment for various forms of knee joint instability. The proposed "all inside" method offers relative simplicity, reproducibility, minimal intraoperative risk, maximum anatomical and functional restoration of the knee joint, and reliable fixation. This approach enables patients to return to their previous levels of

physical activity in a shorter time span. The method is particularly relevant in modern times and should be considered for athletes and individuals leading active lifestyles.

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