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# RECONSTRUCTION OF THE ANTERIOR CRUCIATE LIGAMENT VIA ARTHROSCOPIC SURGERY

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## ABSTRACT

There were 12 patients in our study group. Eight were females and males. The mean age of the patients was 36.3 years. Six patients sustained injury due to slip and fall, five due to road traffic accidents, and 1 was a sports injury. X-rays were taken on the next day of surgery. After wound inspection, all the patients were mobilized on day 2 of the surgery. All patients got discharged on postoperative day two except one patient who was kept for observation for one more day as he had effusion and was discharged on postoperative day 3. A complete range of motion of the operated knee was seen at discharge. All the patients had no intraoperative and immediate complications. At six months and 18th months follow-up, three patients had quadriceps wasting, and one patient had effusion within two months of follow-up, which was treated conservatively, and the effusion resolved. Scoring was done with ten patients showing excellent outcomes and two falling in the good category.



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## 1. INTRODUCTION

Anterior cruciate ligament injuries have become prevalent due to sports, RTA, falls, and other activities. They are very common among young people and sportspeople. The anterior cruciate ligament plays a crucial role in the knee. Both passive (ligamentous) and active (neuromuscular) joint constraints impact dynamic knee stability. Long considered the principal passive constraint to anterior translation of the tibia concerning the femur [1, 2], the ACL is one of the contributions to knee joint stability. Furthermore, because of its unique orientation, the ACL contributes to knee rotational stability in both the frontal and transverse planes [3,4].

The ACL has been the subject of several biomechanical and anatomical research in recent decades, and it is one of the most extensively studied parts of the human musculoskeletal system. ACL tears are among the most prevalent and debilitating knee injuries, primarily caused by sports participation5. Joint effusion, altered mobility, muscular weakness, and impaired functional performance are common side effects of these injuries, which can cause young athletes to miss a full season or more of sports participation [5].

Meniscal tears, chondral lesions, and an elevated risk of early-onset post-traumatic osteoarthritis are all long-term clinical consequences of ACL injuries [5, 6].

The ACL has traditionally been regarded as having poor healing ability, with a high failure rate (40 percent to 100 percent) even after surgical suture repair5. Due to the dismal results of ACL primary repair, suture repair has been completely abandoned in favor of ACL reconstruction [5].

The gold standard of care for ACL injuries has remained ACL reconstruction [5,7], especially for young people and athletes who want to return to high-level sports. However, current surgical therapy for ACL injuries is expensive, has varied results, and is linked to a significant incidence of post-traumatic OA within two decades after injury8. While few athletes can return to their pre-injury activity level without surgery, surgical repair is not always effective in restoring patients to their pre-injury activity level [5, 8- 9]. Athletes who successfully return to exercise are also at a high risk of suffering a second knee injury with much worse outcomes10.

The rupture of the anterior cruciate ligament marks the beginning of the knee's demise. The "ACL injury cascade," as hypothesized by Daniel et al. 17, is a set of events that can occur after ACL damage. ACL shortage causes instability, which causes subsequent meniscal injury, which can lead to joint degeneration. Reconstruction of the ACL has progressed over time. Many famous surgeons proposed numerous extraarticular and intraarticular ACL restoration methods. Compared to extraarticular ACL restoration, research has shown that intraarticular ACL reconstruction treatments provide near-normal joint stability [10].

Using both a BPTB graft and a hamstring graft in arthroscopic ACL restoration is becoming more prevalent. We employed an autogenous hamstring graft for arthroscopic ACL restoration in our study. The functional outcomes were evaluated for a maximum of 18 months and a minimum of 6 months [11, 12].

## 2. MATERIALS & METHODS

After obtaining Institute ethics council approval, a prospective study of 12 cases of arthroscopic ACL reconstruction using autogenous four-tailed Hamstring autograft was conducted in the Department of Orthopaedics, Sri Lakshmi Narayana Institute of medical sciences, Puducherry, from September 2014 to October 2016. Patients were taken up for surgery only if they met the following criteria. Patients with ACL deficiency who complain of knee instability demonstrated by positive anterior drawers and positive Lachman's test, Skeletally mature patients. The patients with severe osteoarthritis, an infected knee, or a Knee with fixed flexion deformity were excluded from the study. In addition, stiff knee patients, ligamentous laxity or ACL reconstruction surgeries or having multi-ligamentous injuries, and skeletally immature patients were also excluded from the study. On arrival at the hospital, all the patients underwent a thorough clinical examination of the affected knee. The previous clinical history regarding the mode and mechanism of injury was carefully recorded. The clinical evaluation was based on the Lachman test, Anterior Drawers Test, Pivot Shift Test, Valgus or Varus Stress Test, and McMurray's test was done.

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## 3. RESULTS & DISCUSSION

We had a maximum follow-up duration of 18 months and a minimum of 6 months in our trial of arthroscopic ACL restoration utilizing hamstring autograft in 12 patients. Patients were checked every two weeks for the first three months, then every six months after that. All patients could acquire the full range of motion except for one who experienced effusion

twice in the first two months after surgery. Thigh muscular atrophy affected three more patients (difference of 2.5cm-1 cm with the contralateral thigh).

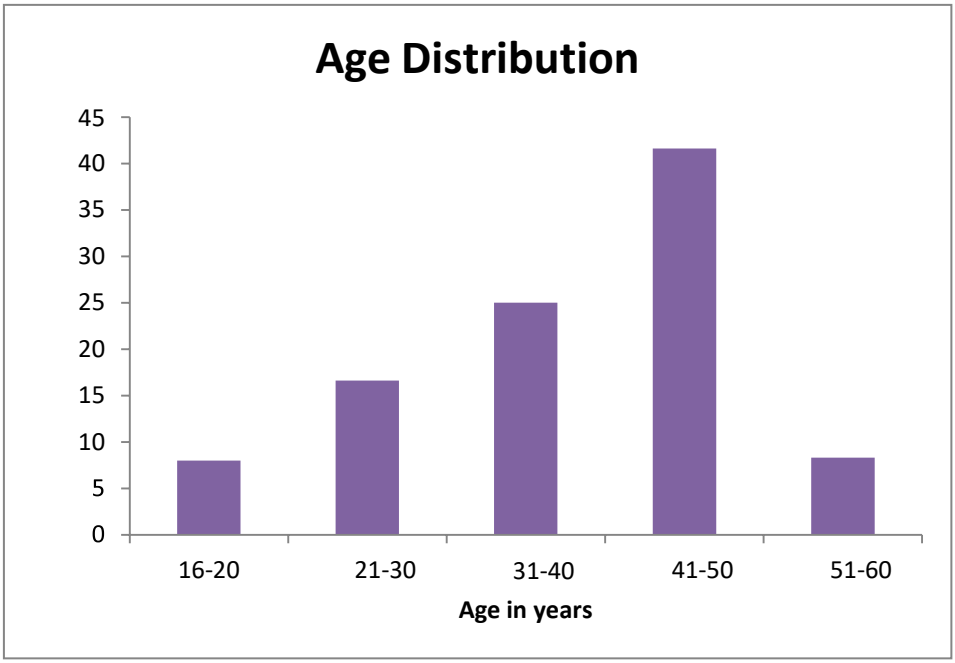


**Figure 1**. Age Distribution among the participants.

The age of the study population ranged from 16 – 60 years, with a mean age of 36.33 yrs of the 12 patients included in the group. Maximum incidence was in the age group between 41-50 at 41.66 % (Figure. 1). In our study group of 12 patients, 8 were males and 66.66%, and 4 were females, 33.33%. In our study, six patients sustained injury due to slip and fall, five due to RTA, and one had a sports injury (figure 2). In our study, six patients sustained injury due to slip and fall, five due to RTA, and one had a sports injury.

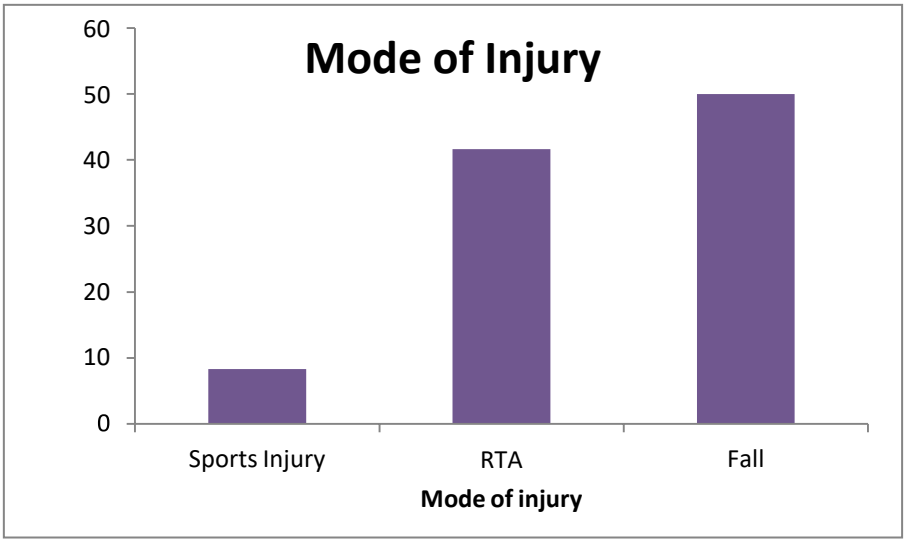


**Figure 2.** Mode of injury in the enrolled participants.

In our study, seven persons had an injury to the right knee, and 5 sustained an injury to the left knee. In our study, five persons had associated medial meniscus injury, two people had medial collateral ligament injury, and 1 had lateral meniscus injury. In our study, we evaluated the patient using by lysholm knee scoring system. The pre and postoperative lysholm scores. The functional outcome using the lysholm scoring system in our study is found to be as described in Figure 3.

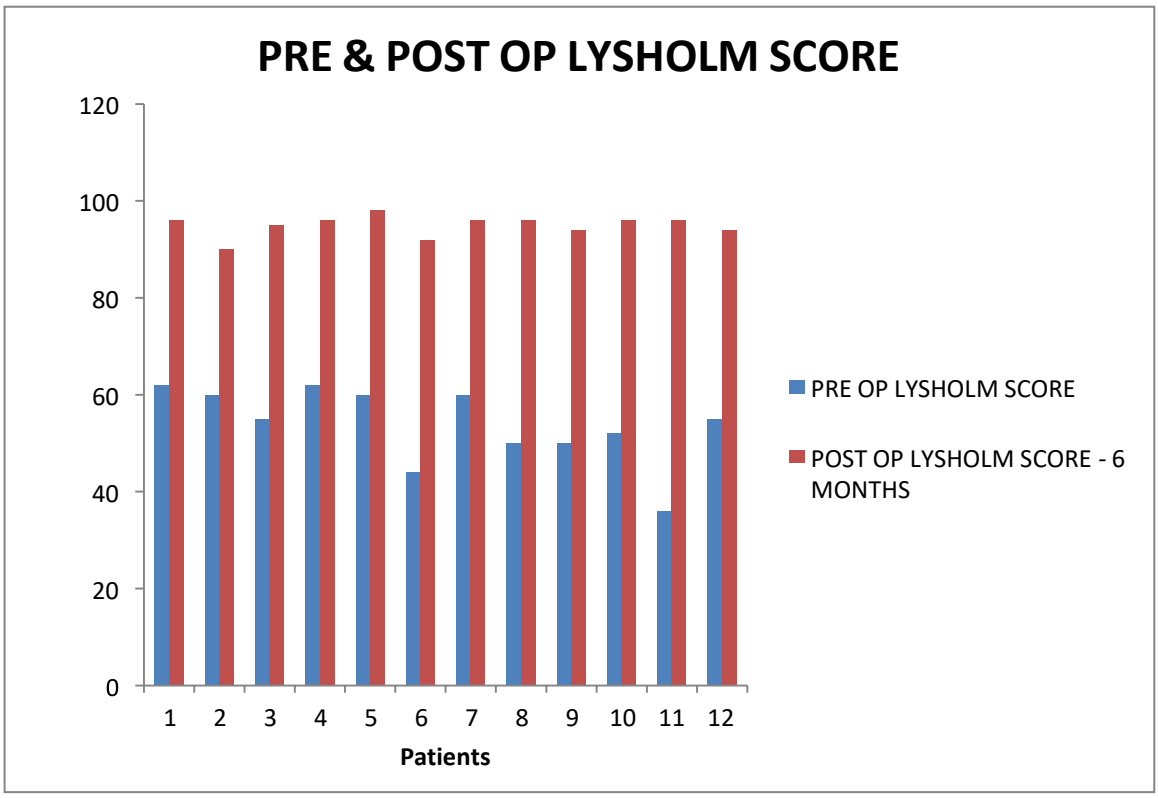


**Figure 3**. Details about the Lyshom score.

## 4. CONCLUSIONS

Thigh muscle atrophy compared to the contralateral limb was not seen in most cases, except in 3 patients who did not follow the postoperative rehabilitation regime. No instability, pain, or restriction of range of motion was noted in any of the patients. All the patients returned to their normal activity level within five months after surgery. No further meniscal injury was reported in any of the cases.

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## ETHICAL APPROVAL

Nil

## COMPETING INTEREST

The authors declare no conflict of interest.

## REFERENCES


[1]. Butler DL, Noyes FR, Grood ES. Ligamentous restraints to anterior-posterior drawer in the human knee. A biomechanical study. JBJS. 1980;62(2):259-70.

[2]. Kiapour AM, Wordeman SC, Paterno MV, Quatman CE, Levine JW, Goel VK, Demetropoulos CK, Hewett TE. Diagnostic value of knee arthrometry in the prediction of anterior cruciate ligament strain during landing. The American journal of sports medicine. 2014;42(2):312-9.

[3]. Levine JW, Kiapour AM, Quatman CE, Wordeman SC, Goel VK, Hewett TE, Demetropoulos CK. Clinically relevant injury patterns after an anterior cruciate ligament injury provide insight into injury mechanisms. The American journal of sports medicine. 2013;41(2):385-95.

[4]. Quatman CE, Kiapour AM, Demetropoulos CK, Kiapour A, Wordeman SC, Levine JW, Goel VK, Hewett TE. Preferential loading of the ACL compared with the MCL during landing: a novel in sim approach yields the multiplanar mechanism of dynamic valgus during ACL injuries. The American journal of sports medicine. 2014;42(1):177-86.

[5]. Hewett TE, Di Stasi SL, Myer GD. Current concepts for injury prevention in athletes after anterior cruciate ligament reconstruction. The American journal of sports medicine. 2013;41(1):216-24.

[6]. Feagin JR JA, Curl WW. Isolated tear of the anterior cruciate ligament: 5-year follow-up study. The American journal of sports medicine. 1976;4(3):95-100.

[7]. Musahl V, Becker R, Fu FH, Karlsson J. New trends in ACL research. Knee Surgery, Sports Traumatology, Arthroscopy. 2011;19:1-3.

[8]. Murray JR, Lindh AM, Hogan NA, Trezies AJ, Hutchinson JW, Parish E, Read JW, Cross MV. Does anterior cruciate ligament reconstruction lead to degenerative Disease? Thirteen-Year results after bone–patellar tendon–bone autograft. The American journal of sports medicine. 2012;40(2):404-13.

[9]. Ardern CL, Webster KE, Taylor NF, Feller JA. Return to the preinjury level of competitive sport after anterior cruciate ligament reconstruction surgery: two-thirds of patients have not returned by 12 months after surgery. The American journal of sports medicine. 2011;39(3):538-43.

[10]. Shelbourne KD, Gray T, Haro M. Incidence of subsequent injury to either knee within 5 years after anterior cruciate ligament reconstruction with patellar tendon autograft. The American journal of sports medicine. 2009;37(2):246-51.

[11]. Clancy Jr WG. Anterior cruciate ligament functional instability: A static intra-articular and dynamic extraarticular procedure. Clinical Orthopaedics and Related Research®. 1983 Jan 1;172:102-6.

[12]. Ayyaswamy G, Bupesh G, Theoder AS, Rajasekar MK. Infections associated with post-surgical wounds at a medical college and hospital in chennai. Journal of Pharmaceutical Negative Results. 2022 Dec 31:9576-83.