

## Functional Outcome of Arthroscopically Assisted Anterior Cruciate Ligament Reconstruction

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**Abstract:** Anterior cruciate ligament (ACL) tear is the most common ligamentous tear of knee joint. The goal of reconstruction of ACL is to restore the stability of knee joint. This study is to evaluate the functional outcome of Arthroscopically assisted ACL reconstruction using Bone patellar tendon bone graft and quadrupled hamstring graft. Our study of 30 cases of arthroscopic ACL reconstruction (21 Bone patellar tendon bone graft, 9 Quadrupled Hamstrig Graft). We have evaluated the knee function pre and post operatively using international knee documentation committee (IKDC) and Lysholm score. Our study showed that Arthroscopically assisted ACL reconstruction could effectively improve stability and function of knee joint. Our results were almost similar to the results obtained in the standard published literature.

**Key Words:** Anterior cruciate ligament, Bone patellar tendon bone graft, International knee documentation committee, Quadrupled hamstring graft, Lysholm score.

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### I. Introduction

Anterior cruciate ligament (ACL) tear is the most common serious ligamentous injury to the knee joint<sup>1, 2</sup>. The ACL is the primary stabilizer against anterior translation of the tibia on the femur<sup>3</sup> and is important in counteracting rotation and valgus stress. Anterior cruciate ligament deficiency leads to knee instability. This results in recurrent injuries and increased risk of intra-articular damage, especially the meniscus<sup>4, 5</sup>. The goals of the ACL reconstruction are to restore stability to the knee; allow the patient to return to normal activities, including sports; and to delay the onset of osteoarthritis with associated recurrent injuries to the articular cartilage and loss of meniscal functions<sup>6-8</sup>. During the past decade arthroscopically assisted techniques have been an accepted method of reconstructing the ACL<sup>8-10</sup>. Despite an abundance of literature on ACL reconstruction and its outcome, there are little data directly comparing hamstring tendon autograft and patellar tendon autograft to aid the patient and surgeon in selecting the appropriate graft<sup>11</sup>. There is little or no difference between bone-patellar tendon-bone and combined semitendinosus and gracilis hamstring tendon grafts in terms of the functional outcome after ACL reconstruction, despite greater laxity measurements in the hamstring tendon group patients. This suggests that operating surgeon must decide how to select the appropriate graft for an individual patient<sup>12</sup>. Graft choice, Surgeon experience, correct graft position, choice the graft fixation, and postoperative rehabilitation confound the results of comparison of ACL reconstruction<sup>13</sup>. Stiffness and strength tend to be slightly better with bone-patellar tendon-bone, but overall results are comparable<sup>14</sup>.

The advantages of arthroscopically assisted anterior cruciate ligament reconstruction include elimination of capsular incisions, decrease in trauma to the fat pad, avoidance of desiccation of the articular cartilage, better visualization of the femoral attachment, and a lower incidence of post-operative patellofemoral pain than with open reconstruction<sup>15</sup>. The primary disadvantage of arthroscopically assisted technique is that the technique has a long learning curve and is a technically demanding procedure<sup>16</sup>.

The bone-patellar tendon-bone and the hamstring tendon are the two most commonly used autografts for reconstruction<sup>17,21</sup>. The bone-patellar tendon-bone graft has been widely accepted as gold standard for ACL reconstruction with high success rate. However donor site morbidities and extensor mechanism problems associated with bone-patellar tendon-bone graft have led to increasing popularity of hamstring tendon graft which had advantages of low donor site morbidities, avoidance of extensor mechanism problems and better cosmesis. In our study we have analyzed the results of Arthroscopic ACL reconstruction using autologous ipsilateral bone patellar tendon bone graft and quadrupled hamstring graft.

## II. Materials And Methods

Between June 2010 to September 2013 30 consecutive patients who underwent arthroscopic assisted ACL reconstructions in the Department of Orthopaedics and Traumatology, Maharajah's institute of medical sciences, Nellimarla, Vizianagaram is the material in our study. After the patient is clinically and radiologically (Magnetic Resonance Imaging) diagnosed to have tear, and after meeting inclusion criteria, the patients were taken up for Arthroscopic ACL reconstruction. All the patients were followed up at regular interval i.e. 3 months, 6 months, 12 months and 18 months and 24 months (prospective study). The outcome was evaluated in all cases at the latest follow-up (at least 6 months). In patients with BPTB graft it was fixed with titanium interference screws on femoral and tibial side. In patients with hamstring graft it was fixed with interference screws on tibial side and transfix screw on femoral side .

**Fig 1**



## III. Results

In our study of Arthroscopic Cruciate Ligament reconstruction, a total of 30 cases were operated and followed up. Minimum follow up period was six months and maximum follow up period was twenty four months period.

**Fig 2(BPTB graft)**



**Fig 3(Hamstring graft)**



In our study Lysholm score was done at pre op, 3 months, 6 months, 1 year, 18 months and 2 years. Average Lysholm score at pre op 52.9, 3 months 82.2, at 6 months 89, at 1 year 91.4, 18 months 93.5 and at 2 years 94.8. There was clinically significant improvement in Lysholm score pre operative period (52.9) to 6 months post operative period (89) with p value <0.01.

In our study IKDC score was done at pre op, 3 months, 6 months, 1 year, 18 months and 2 years. Average IKDC score at pre op 48.8, 3 months 85.8, at 6 months 89.8, at 1 year 92, 18 months 93 and at 2 years 93.5. There was clinically significant improvement in Lysholm score pre operative period (48.8) to 6 months post operative period (89.8) with p value <0.01.

#### IV. Discussion

Average age at surgery in the present study group was 26 years and that of D Choudhary et al. 2005 was 27 years and that of Jomha et al. 1999 was 26 years and Railey et al. 2004 was 33 years and Mahir et al. 2005 was 24 yrs. Average duration of follow-up of the present study was 13 months with a minimum follow-up period 6 months and maximum follow-up period was 24 months. Average duration of follow-up D Choudhary et al. 2005 was 12 months and that of Jomha et al 1999 was 84 months, Railey et al. 2004 was 24 months, Mahir et al. 2005 was 18 months. The measured Lysholm score of D Choudhary et al. 2005 at the end of the study was 92, Jomha et al. 1999 at the end of the study was 94, Railey et al. 2004 at the end of the study was 91, Mahir et al. 2005 was 93.5 and our study average Lysholm score at end of the study is 92.5.

#### V. Conclusion

Majority of study subjects were males i.e., 30 out of 30. Patients with isolated ACL injury had better outcome compared to patients who underwent associated meniscectomy. (P<0.05). There is significant pre operative to post operative improvement in knee functional scores both Lysholm and IKDC (P <0.01). Post operatively at 3 months anterior drawer's was 1+ in 17% patients which improved with rehabilitation in all patients. Post operatively at 3 months 90% patients had normal range of motion. Post operatively at 3 months 80% patients had 5/5 quadriceps power (MRC grading) 94% of them had 5/5 power at latest follow up. In our study we had various complications like Anterior Knee Pain, Superficial infection and Deep infection which were treated. Autologous ipsilateral bone patellar tendon bone graft and quadrupled hamstring graft have produced good to excellent post operative functional scores which clinically significant.

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