



THE FUNCTIONAL OUTCOME OF ARTHROSCOPIC ACL RECONSTRUCTION WITH SEMITENDINOUS GRAFT SECURED WITH ADJUSTABLE SUSPENSION BUTTON PROXIMALLY AND INTERFERENCE SCREW DISTALLY USING IKDC SCORING

Orthopaedics

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ABSTRACT

Background: Arthroscopic anterior cruciate reconstruction has become one of the most successful surgical techniques in sports medicine however initial secure graft fixation is essential for the success of any ACL reconstruction. **Objective:** The study was done to evaluate the functional outcome of arthroscopic ACL reconstruction using hamstring graft fixed with suspension button for femur and interference screw for tibial fixation. **Material And Methods:** From 2017 to 2018 January in Sree Gokulam Medical College Venjaramoodu, Trivandrum, 48 patients underwent ACL reconstruction using semitendinous graft fixed with suspension button at femur and interference screw at tibial site. 8 patients were excluded from the study. The age group in our study was between 20-50 years of age. We assessed the patients preoperatively and postoperatively with 6 and 24 months interval by IKDC knee score 2000. **Results:** Our study showed that Arthroscopically assisted ACL reconstruction could effectively improve stability and function of knee joint. In our study IKDC score was done at pre op and post-op with 6 and 24 months interval. Mean average IKDC score was 38.995 during the preoperative period, at 6 months was 55.253 and 24 months was 88.111. On comparison of the mean values for IKDC scoring for (a) preoperative period to 6 months was 16.258, (b) preoperative period to 24 months was 49.116 and (c) 6 months to 24 months postoperative period was 32.858. The P values for all these comparisons were <0.001, hence significant. There were eleven Isolated ACL injuries who had pre-op , six and twenty fourth month post-op functional score of 44.04, 63.35 and 90.259 respectively. Ten ACL with lateral meniscus injuries had pre-op , six and twenty fourth month post-op functional score of 35.62, 53.85 and 88.348 respectively. Nineteen ACL with medial meniscal injuries had pre-op , six and twenty fourth month post-op functional score of 37.85, 51.30 and 86.74 respectively. **Conclusion:** Isolated ACL had better functional score. The improvement in the IKDC score was during the 6-24 month range. When ACL with meniscal injuries were compared, the one with ACL reconstruction and lateral meniscetomy showed better outcome.

KEYWORDS

Anterior cruciate ligament, hamstring graft, arthroscopy, International knee documentation committee.

INTRODUCTION

Anterior cruciate ligament (ACL) injuries commonly occur in individuals involved in sports with knee pivoting movements such as foot ball, volleyball, basketball & kabaddi . [1] Reconstruction of ACL allows the patient to return to pre-trauma activity level and delay the onset of degenerative changes of the knee joint. [2] Reconstruction is also essential to restore the stability of the knee. [3] The methods of ACL reconstruction includes open ACL reconstruction and arthroscopic ACL reconstruction. Arthroscopic ACL reconstruction has become the "Gold Standard" of care for ACL insufficiency in active patients where there is marked reduction in postoperative morbidity. It enables early vigorous physiotherapy as compared to open procedure which needs excessive soft tissue dissection leading to complications such as postoperative pain, high rate of infection, scarring, post surgical knee stiffness and prolong rehabilitation. For decades, the patellar tendon was the most common autograft for ACL reconstruction. This technique renders good results, which has advantage of bone to-bone healing. The potential morbidity like patellofemoral pain, loss of motion and patellar fracture in patellar tendon graft has promoted the use of hamstring tendon graft as alternative graft source for ACL reconstruction. [4,5] The quadrupled hamstring tendon graft has excellent strength, minimal impact on the knee extensor mechanism and excellent postoperative outcomes. [6,7,8] The graft fixation choice varies from cross pin, bioabsorbable screws, suspension button at femoral end and interference screw at tibial end ,which plays an important role. Successful ACL reconstruction can be achieved with rigid fixation of a strong graft. This study was to determine the functional outcome of acl reconstruction with or without medial/lateral meniscetomy by using IKDC scoring.

MATERIALS AND METHODS

48 patients had undergone arthroscopic assisted ACL reconstruction using trippled semitendinosus tendon autograft with adjustable suspension devise at femur and interference screw at tibia in our Institute under the Department of Orthopaedics between the period of 2017 to 2018. The age groups of the patients were between 20 to 50 years of age.

Exclusion criteria were as follows: (1) Age between 20 years and

50years (2) Gracilis been used in addition to Semitendinosus graft (3) Cases where bone patella tendon bone been used as graft (4) revision cases (5) multiple ligament injuries (6) chondral lesions greater than grade 2 according to the Outerbridge classification (7) additional injuries to the collateral ligaments and history of contralateral ACL injury (8) Lowerlimb long bone fractures during the follow up (9) Cases who did not follow up inspite of two reminders.

Surgical technique-Spinal anaesthesia, tourniquet control with patient supine and leg positioning over the table were followed for all the patients. After arthroscopic confirmation of ACL tear, the associated lesions were managed at first. Partial meniscetomy or trimming of unstable segments for meniscal tears was done, if present. The hamstring tendon (semitendinosus) harvested from the ipsilateral limb through a small vertical incision over the pes anserinus. The tendon was tripled maintaining it at least 8 cm in length with a minimum diameter of 7.5 mm. The tendon was looped to the adjustable suspension button to make a construct.. With knee in hyperflexion, through Anteromedial portal After identification of the bony anatomic landmarks at the native ACL footprint, namely the "resident's" ridge, the femoral socket was created by first drilling the guidepin till it exited the skin at the thigh and later on reaming the size of the graft diameter about 20mm in depth. The femoral tunnel positioned at 10- 10:30 analogue clock position for right knee and 2-2:30 analogue clock position for left knee.

The required size tunnel was made on the tibial side by using a ACL jig at 50 degrees angle and using cannulated reamer equivalent to the graft size over the guide pin. The graft along with adjustable suspension was pulled through the femoral tunnel and size was adjusted after flipping the button. The knee was subjected to multiple cycles with tension on the graft. The tibial side graft was secured with appropriate size interference screw at about 15-20 degrees of knee flexion.

Patients were subjected to nonweight bearing crutch walking for 2 weeks, and static quadriceps and straight leg raising encouraging knee extension. Patients were subjected to routine Acl protocol. Patients were followed up at 2 weeks, 1 month, 3 months, 6 months and 24 months. The patients were evaluated using the international knee documentation committee form and VAS SCORE at preop, 6 months and 24 months.

RESULTS

Out of 48 cases, 40 cases of arthroscopic assisted ACL reconstruction using tripled semitendinosus tendon autograft secured with adjustable suspension button at femur and interference screw at tibia were included in our study. All the cases had acl injury either while playing/ twisting while running/ or slipping and falling. None of the cases were elite sports candidates. 8 patients were excluded from the study because 2 had injured the opposite limb ACL subsequently, 3 had sustained lower limb long bone fracture and 3 lost to follow up. Study group was between 20-50 years.

Our study showed that Arthroscopically assisted ACL reconstruction could effectively improve stability and function of knee joint. In our study IKDC score was done at pre op and post-op with 6 and 24 months interval. Mean average IKDC score at pre op was 38.995, at 6 months was 55.253 and 24 months was 88.111. On comparison of the mean values for IKDC scoring for (a) preoperative period to 6 months was 16.258, (b) preoperative period to 24months was 49.116 and (c) 6 months to 24 months postoperative period was 32.858. The P values for all these comparisons were <0.001, hence significant.

There were eleven Isolated ACL injuries which had pre-op functional score of 44.04 and post-op 63.35 and 90.259. Ten ACL with lateral meniscus injuries had pre-op functional score of 35.62 and post-op 53.85 and 88.348. Nineteen ACL with medial meniscus injuries had pre-op functional score of 37.85 and post-op 51.30 and 86.74.

All the patients had no symptoms post operatively and had a full range of motion.

DISCUSSION

Development in arthroscopic techniques and improvement in technology and research have allowed anterior cruciate reconstruction to become one of the most successful surgical techniques in sports medicine. [9] With advances in accelerated postoperative rehabilitation programs and initial strengths of tripled hamstring graft is greater than the native anterior cruciate ligament. [10] Initial secure graft fixation is essential for the success of any ACL reconstruction. Attainment of rigid graft fixation minimizes or prevents failure or elongation during cyclic loading at the graft fixation sites prior to biologic incorporation. [11] In our study we have found that all patients were able to return to their jobs at the end 1 month. Noyes et al. hypothesised that ACL can load approximately 454 N (100 pound) for most activities. [12] The load on the ACL graft can be even greater when the graft is overtensioned. [13] Marder et al. utilized a two bundle semitendinosus construct and femoral endobutton in sixty two patients, and reported improved anterior stability. [14] Nabelung et al reviewed the result of twenty nine anterior cruciate ligament reconstructions with hamstring graft and endobutton. They graded 66% of the result as normal and near normal using the criteria of the International Knee Documentation Committee. [15] Chae-Gwan et al. showed that endobutton femoral fixation showed good results that were comparable to those of cross pins fixation in hamstring ACL reconstruction. [16] We used adjustable suspension button for femoral graft fixation in all the patients which showed normal to nearly normal outcome. Cardon et al. suggested that interference screw fixation of hamstring tendon in ACL reconstruction is better when round threaded biodegradable interference screw rather than round threaded titanium screw. [17] Johnson LL et al has compared both bioabsorbable versus titanium interference screws with hamstring tendon graft in ACL reconstruction and concluded that there were no differences in clinical outcome at any stage of follow up to 2 years. [18] In our study threaded biodegradable interference screw was used for all the patients. ACL reconstruction when performed with technical precision has become a reliable reproducible surgical technique with a predictable outcome. Successful results can be achieved via anatomic reconstruction with rigid fixation of a strong graft. Hamstring autograft is a good option available nowadays. However the fixation techniques continue to evolve. Often the choice of fixation depends on the surgeon preference and his or her experience with the fixation device. In our study suspension button seems to be the better device for fixation of hamstring graft at the femoral tunnel with least complication and minimum instrumentation. For the tibial tunnel threaded biodegradable interference screw.

CONCLUSION

Isolated ACL had better functional score. When ACL with meniscal injuries were compared, the ACL reconstruction with lateral

meniscetomy showed better outcome.

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