

Clinical outcome of Arthroscopic Anatomical Anterior cruciate ligament reconstruction using single bundle Hamstring tendon

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Abstract :

Background: Anatomical single bundle arthroscopic Anterior cruciate ligament (ACL) reconstruction has been the standard treatment for ACL injured patients. It is a minimally invasive procedure that allows the surgeon to understand the internal derangements of the knee joint. ACL is the commonly injured ligament in young adults. The purpose of Arthroscopic ACL reconstruction is to restore the normal kinematics of knee joint

Aim: To evaluate the Clinical outcome of Arthroscopic Anatomical ACL reconstruction using single bundle Hamstring tendon

Materials and methods: It is a prospective study of 15 cases of young injured ACL patients who underwent Arthroscopic Anatomical ACL reconstruction using single bundle Hamstring tendon with endobutton fixation in femoral side and Interference screw in tibial side carried out in our Department of Orthopaedics, Thanjavur medical college from April 2015 to July 2016. All the patients were included in the study after clinical and radiological examination.

Results: Post op evaluation was done using Lysholm score. All the patients in our study had a negative Lachman and pivot test in the follow up. No patients in our study needed revision. In our study good to excellent result was observed in 80 % of the cases, fair in 13 of the cases and poor outcome in 7 % of the cases.

Conclusion: Arthroscopic Anatomical ACL reconstruction using single bundle Hamstring tendon gives good functional results. Good to excellent results have been associated with pure ACL injury whereas poor result was associated with chondral injury.

Keywords: Anterior cruciate ligament, Arthroscopy, Hamstrings

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I. Introduction

Anatomical single bundle arthroscopic ACL reconstruction has been the standard treatment for ACL injured patients⁽¹⁾. It is a minimally invasive procedure that allows the surgeon to understand the internal derangements of the knee joint. ACL is the commonly injured ligament in young adults. ACL contains two bundles viz 1. Anteromedial and 2.Posterolateral⁽²⁻³⁾. In arthroscopic ACL reconstruction placing the soft tissue graft in the isometric position is the key to restore normal knee function. There are various graft options⁽⁴⁾ available for ACL reconstruction including BTB, quadriceps and cadaveric grafts. Regarding the anatomical ACL reconstruction, two techniques are followed. One is the single bundle and another one is the double bundle ACL reconstruction⁽⁵⁾. In our study we performed single bundle Hamstring tendon Arthroscopic Anatomical ACL reconstruction. ACL injuries occur most frequently in sports injuries and in road traffic accidents. It is often associated with medial meniscus injury.

II. Materials And Methods

It is a prospective study carried out in our Department of Orthopaedics, Thanjavur medical college, Thanjavur from April 2015 to July 2016. In our study, 15 cases of young injured ACL patients underwent Arthroscopic Anatomical ACL reconstruction using single bundle Hamstring tendon with endobutton fixation in femoral side and Interference screw in tibial side. We included isolated ACL injuries, associated with medial and lateral meniscal injuries. All the patients in the study group were males of age 20 – 35. PCL, Collateral ligament injuries, avulsion fractures of cruciate ligaments and ACL injuries in degenerated knee were excluded. Lachman, drawer test, varus, valgus stress tests and Mc Murrays tests were carried out. X ray and MRI of knee joint was done in all cases. Preoperative rehabilitation was advised to do quadriceps exercises, knee-bending upto 120°

Surgical technique:

Patient was positioned after anaesthesia, with iv antibiotic coverage and under tourniquet control, through standard Anterolateral portal, joint was visualised. Meniscal tears were addressed and the ACL foot prints were prepared. Semitendinosus and Gracillis grafts were harvested, quadrupled and its size was measured. Anatomical Femoral tunnel made at 10.30 clock position⁽⁶⁾ in right knee and at 1.30 clock position in left knee through the anteromedial portal⁽⁷⁾. With the tibial jig at an angle of 55° placed in between the center of tibial spines 9mm anterior to PCL or posterior to anterior horn lateral meniscus tibial tunnel was made. Graft was passed and fixed with Endobutton in femoral side and after cycling tibial side graft was fixed with interference screw with tibia in extension. Femoral notch was visualized to rule out impingement of the graft. Graft donor site was closed and knee brace was applied. Patient was advised to do knee bending in the second postoperative day, quadriceps exercises. Suture removal done at 2 weeks. ACL reconstruction rehabilitation protocol was advised and followed at 6, 10, 14, and 20 weeks.



Figure 1a. Shows MRI with injured ACL.



Figure 1b. Shows postop X ray



Figure 2a. Shows MRI with injured ACL



Figure 2b. Shows postop X ray



Figure 3a. Shows MRI with injured ACL



Figure 3b. Shows postop X ray

III. Result

All the 15 patients were evaluated with standard AP and Lateral radiographs. They were followed up at regular intervals 6, 10, 14 and at 20 weeks post surgery. The Lysholm score was used for the evaluation of postoperative knees. . All the patients in our study had a negative Lachman and pivot test in the follow up. No patients in our study needed revision and 60 % of the patients were between 20 – 25 years age group.

Table 1. Age distribution of the patients

Age in years	No of cases	% of cases
20 – 25	9	60
26 – 30	4	27
31 -- 35	2	13

The postoperative Range of Movement (ROM) of the knee is near normal in 87 % of the cases. In our study isolated ACL injury was seen in 53%, associated medial meniscus in 27 %, Lateral meniscus in 13 %, and chondral injury in 7 % of the case. In the current study, good to excellent result was observed in 80 % of the cases, fair in 13% of the cases and poor outcome in 7 % of the cases.

Table 2. Distributio

	No of cases	% of cases
0 – 120 flexion	13	87
Terminal restriction of flexion	2	13
Terminal restriction of extension	0	0

n of Type of Range of Movement of knee

Table 3. Associated injuries

Type of Injuries	No of cases	% of cases
Isolated ACL Injury	8	53
Medial meniscus Injury	4	27
Lateral meniscus Injury	2	13
Chondral Injury	1	7

IV. Discussion

ACL injuries are now in the increasing trend because of increasing number of RTA and involvement of sports. In our study we did Arthroscopic Anatomical ACL⁽⁸⁾ reconstruction using single bundle quadrupled Hamstring tendon which is the gold standard procedure for injured ACL that give good stability and resistant to load. We used anteromedial portal for placing the femoral tunnel which was very close to the anatomical location of native ACL which restores the knee kinematics close to the uninjured knee. The main advantage of Arthroscopic Anatomical ACL reconstruction using single bundle Hamstring tendon is the greater pain relief and stability with minimal donor site morbidity and earlier return of knee function to preinjury states.

Table 4. Lysholm score

Result	No of cases	% of cases
Excellent	8	53
Good	4	27
Fair	2	13
Poor	1	7

In the current study, good to excellent results was observed in 80 % of the cases as per Lysholm score evaluation. In our study we noted few complication that include one case each of superficial infection that healed with dressings and antibiotics, numbness in leg which got relieved after 4 weeks due to increased tourniquet time, beath pin breakage preoperatively which was removed arthroscopically and Cyclops⁽⁹⁾ lesion who lost the follow up for further intervention. All the patients in our study had a negative Lachman and pivot test in the follow up. No patients in our study needed revision. Thirteen (87 %) cases showed excellent postoperative range of movement making Arthroscopic Anatomical ACL reconstruction using single bundle Hamstring tendon as the procedure of choice which gives predictable clinical outcomes in ACL injured patients.

V. Conclusion

Arthroscopic Anatomical ACL reconstruction using single bundle Hamstring tendon provides early recovery to pre injury states with less postoperative pain increased functional range of movement of knee with minimum donor site morbidity.

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