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Short term outcome of arthroscopic single bundle ACL reconstruction using quadruple hamstring graft by transportal technique for complete ACL tear

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Abstract

Objective: To study short term outcome of arthroscopic single bundle ACL reconstruction using quadruple hamstring graft by transportal technique.

Introduction: Arthroscopic ACL reconstruction is the 'Gold Standard' treatment for ACL tear. 70% of ACL injuries occur through non-contact mechanisms. The goal of surgery is to prevent instability & restore the functions of torn ligament & creating a stable knee. Various grafts are used but quadruple hamstring graft has excellent material strength with excellent functional outcomes.

Methodology: A cohort of 20 complete ACL tear, treated with arthroscopic single bundle ACL reconstruction using quadruple hamstring graft by transportal technique between Sep 2015 and Sep 2016 were analyzed at minimum 3months follow up.

Results: 20 out of 20 patients had excellent result. Assessment was done using "Modified Cincinnati Scoring System". No major complication were noted.

Keywords: ACL, quadruple hamstring graft, modified cincinnati scoring system

Introduction

The anterior cruciate ligament (ACL) is one of the most commonly injured ligament of the knee. The incidence of ACL injury is higher in people who participate in high risk sports. 70% of ACL injuries occurs through non-contact mechanism. Arthroscopic ACL reconstruction is the gold standard treatment for ACL tear. Quadruple hamstring grafts are most commonly used graft because of excellent material strength. The transportal technique is most commonly used because of more anatomical placement of femoral tunnel.

Methodology

This study focuses on short term outcome of arthroscopic ACL reconstruction assessed by Modified Cincinnati Scoring System. This observational prospective study was conducted at tertiary care hospital between Sep 2015 and Sep 2016. Twenty patients with complete ACL tear were enrolled in this study based on following inclusion and exclusion criteria.

Inclusion criteria

All adult patient with complete ACL tear:

- Young patients (15-50year).
- Primary case of ACL tear.
- Athletic patient with ACL tear.
- Unilateral ACL tear.

Exclusion criteria

- Localized or generalized infection.
- Old age >50 years.
- Patients having moderate to severe osteoarthritis of knee joint.
- Sickle cell positive patient
- Multiligament injury of knee joint.

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- Revision ACL surgery.
- Patient not giving consent for surgery.
- Previous knee surgery.

All patients were evaluated for history of instability, giving away sensation, positive Lachman's test & confirmed by MRI of knee joint. Spinal / epidural anesthesia, tourniquet control and patient in supine position with flexion and valgus force were followed in all patients. After a diagnostic arthroscopy and confirmation of ACL tear, the associated lesions were dealt at first. Partial meniscectomy or trimming of unstable segment or shaving of chondral lesions were performed. The hamstring graft (semitendinosus and gracilis) were harvested and graft was prepared with Ethibond no. 2/5 abd vicryl 1 with 25mm marking at femoral end. According to the size of harvested graft, femoral and tibial tunnel were prepared by transportal technique. The harvested graft was passed through the tunnel and fixed with interference screws at both (femoral and tibial) the ends. Than the harvested graft was checked with probe under arthroscopic vision.



Postoperatively, intravenous antibiotic and analgesic were given to all the patients for 2 days. Than patients were discharged with oral antibiotic and analgesic.

Follow up

All the patients were followed up at 14th day (for suture removal), 1 month, 2 month, 3 month postoperatively. Final follow up were taken at 3month postoperatively in this study. Assessment was done using modified cincinnati scoring system.

Observations and analysis

20 cases of arthroscopic assisted ACL reconstruction using quadruple hamstring graft by transportal technique with interference screws for femoral and tibial end were included in this study.

Among those 12 patients were between 21-30years, 6 patients were between 31-40years, 2 patients were between 41-50years. The youngest patient was 21years and the oldest patient was 43years. All the patients at the end of 3month were assessed by Modified Cincinnati Scoring System which includes following points.

- Pain sensitivity.
- Swelling.
- Giving away sensation.
- Overall activity.
- Walking activity.
- Stairs activity.
- Running activity.
- Jumping / Twisting.

20 out of 20 patients had total score of more than 80 & got excellent result with normal functional knee without any major complication.

Final result

Total score	Result	No. of patients	Percentage
<30	Poor	0	0
31-54	Fair	0	0
55-79	Good	0	0
>80	Excellent	20	100%
TOTAL		20	100%



Postoperative x rays



Clinical photographs

Discussion

Development in arthroscopic technique & improvement in technology and research have allowed ACL reconstruction to be one of the most successful surgery in this modern era. In our study, ACL tear was more common in young age group (21-30years) that correlate with high incidence rate of ACL tear in young patients. In our study, most of the patient came with history of RTA (60%) and history of fall down (40%) as mode of trauma. This suggest that ACL tear occurs more by RTA and fall down in our study. (In western countries, commoner mode established to be sports related injury.) 95% of the total patient had no pain at final follow up with normal knee joint. 1 patient had severe pain at knee joint during follow up because of undiagnosed meniscal tear which

was there after treated with arthroscopic partial meniscectomy. Than that patient had no pain at final follow up. 3 patients had pain at terminal range of motion during follow up period which was managed by physiotherapy. None of the patients had complaint of swelling, giving away sensation, walking problem at final follow up. 55% of the patients could perform vigorous activities but at lower performance level. 35% of the patients had slight problem in stairs activity. 90% of the patients had slight problem in running & jumping activity as we didn't allow the patients to run or jump before 6months postoperative. We compared our study with the following study.

Comparision of present study with study: A

S.no	Parameter	Present study	Study a
1	Number of patients	20	30
2	Age	mean – 21-30years	mean – 21-30years
3	Youngest patient	21year	18year
4	Oldest patient	42year	55year
5	Score	Modified Cincinnati score	IKDC
6	Follow up period	3 months	6 months
7	Graft used	Quadruple hamstrings	Quadruple hamstrings
8	Fixation Technique	Interference screw for femur and tibia	Endo button for femur and interference screw & suture post for tibia
9	Mechanism of injury	RTA & H/O fall	Sports injury
10	Complication	No complication	1 patient had loss of motion of 40%
11	Excellent result with normal knee joint function	100% (by modified Cincinnati score)	80% (by IKDC score)

Study A: Robindro *et al*: Arthroscopic ACL reconstruction
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Conclusion

Majority of the patients were in the age group of 21-30years with RTA & H/O fall down as common mode of trauma. We used interference screws for the both (femoral and tibial) ends for ACL reconstruction. No major complication were recorded during follow up period. Limitations of this study were small population (20 patients) & short term follow up period (3 months). 20 out of 20 patients (100%) had excellent result at the final follow up. To conclude Arthroscopic ACL reconstruction is the surgery of choice for Anterior Cruciate Ligament tear with excellent result and good functional outcome.

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