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Orthopaedics

FUNCTIONAL EVALUATION OF ARTHROSCOPIC ANATOMICAL ACL RECONSTRUCTION - A PROSPECTIVE STUDY

Sankaralal.T*	Associate Professor of Orthopaedics, Karpaga Vinayaga Institute of Medical Sciences, Chinnakolambakkam,Maduranthagam,Tamilndu,India *Corresponding Author
M.Shiyam	CRRI,Karpaga Vinayaga Institute of Medical Sciences, Chinnakolambakkam, Maduranthagam, Tamilndu,India
S.Rajadurai	Assistant Professor of Orthopaedics, Karpaga Vinayaga Institute of Medical Sciences, Chinnakolambakkam,Maduranthagam,Tamilndu,India

ABSTRACT Anterior cruciate ligament (ACL) injury is one of the commonest ligament injuries of knee accounting for200,000 tears in a year. It ofen leads to anterior knee instability and in these cases surgical treatment is necessary to restore normal knee stability and to protect knee from further injury. ACL injury patients<50 year old with or without meniscal injury were included in the study and those with degenerative knee changes were excluded from the study. Overall single bundle anatomical ACL reconstruction produces better clinical results to that of double bundle technique and it is less technically demanding procedure. Single bundle ACL reconstruction with hamstring tendon graft fixed at anatomical ACL footprints provides consistent good functional results.

KEYWORDS : : Anterior cruciate ligament, Knee instability, Tunnel communication, Double bundle technique

INTRODUCTION:

Anterior cruciate ligament (ACL) injury is one of the commonest ligament injuries of knee accounting for 200,000 tears in a year. It often leads to anterior knee instability and in these cases surgical treatment is necessary to restore normal knee stability and to protect knee from further injury. Anterior cruciate ligament (ACL) tears are one of the most common knee injuries and single bundle (SB) ACL reconstruction has been the traditional treatment since long (1-2). There is debate on graft choice for ACL reconstruction and trans-tibial ortrans-portal method of femoral tunnel creation and whether to use single or double bundle ACL reconstruction to get optimal functional results. We present a prospective study of 10 cases of ACL injury operated with arthroscopic anatomical ACL reconstruction using quadrupled hamstring tendon graft through trans-portal technique to evaluate functional outcome in our institute.

There are still many controversies concerning the surgical techniques in anatomic DB reconstruction, namely in procedures for creating anatomic tunnels, graft preparation, tensioning and fixation (3-8) and therefore utility of anatomic DB reconstruction has not yet been fully established.

Materials and methods:

ACL injury patients<50 year old with or without meniscal injury were included in the study and those with degenerative knee changes were excluded from the study.

Surgical technique:

Semi tendinosus and gracilis tendons were harvested and prepared into a four stranded graft. Diagnostic arthroscopy of knee joint was performed. Meniscustear if present was managed according to the pathology. A Femoral tunnel was made just posterior to lateral inter-condylar ridge of lateral femoral condyle. The Tibial tunnel was made at the center of Tibial ACL remnants in line with posterior border ofanterior horn of lateral meniscus. The graft was passedinto tibial and femoral tunnels and fixed with endo button at femoral tunnel and interference screw at the tibial tunnel.

Results:

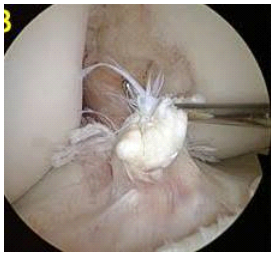

Figure: 1: Arthroscopic view of torn ACL

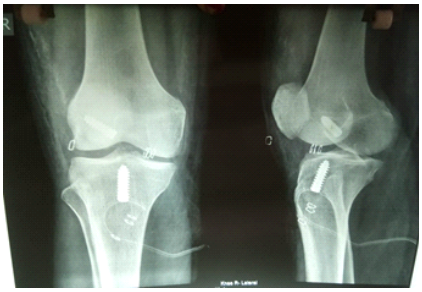

Figure: 2: Post Operative X ray of ACL reconstruction

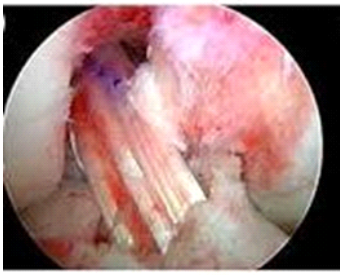

Figure: 3: Arthroscopic view of reconstructed ACL

All the patients in our study were males with ages ranging from 21 to 38 years and the mean age of patients was 30 years. The mode of injury was fall from two wheelers in 6 cases and sports injury in 4 cases. Duration of knee instability symptoms varied from one month to one year after injury. ACL injury was presenting right knee in 7 cases and left knee in 3 cases. Associated meniscus injury was present in 8 patients of which lateral meniscus was involved in 2 cases and medial meniscus was involved in 6 cases. Partial meniscectomy was done in 5 cases and medial meniscal repair was done in one case. By 6 months after index surgery all patients had full range of knee movements and returned to their jobs. The mean Lysholm score and Tegner score was 80.

DISCUSSION:

The pivot shift is able to assess this rotatory component of knee laxity and appears to have the potential to become a benchmark in gauging the success of ACL surgery (9) One concern relates to tunnel enlargement, which can hamper ACL revision surgery because of the potential need for a staged reconstruction in which the tunnels are bone grafted first, followed by the actual revision surgery performed after the bone graft has been incorporated(10) Tunnel communication can also occur when drilling the tunnels if they are placed too close to each other(10-12).

There are lot of studies favouring patellar tendon grafts and hamstring grafts. In a meta-analysis by Freedman and colleagues, patellar tendon graft has advantages of increased stability to knee in terms of more stability and less chance of graft failure but at the cost of increased complications like anterior knee pain and knee stiffness. Overall both the grafts provide excellent return of function with high rate of success. Trans-tibial technique of femoral tunnel creation is out of favors today as it creates a non-anatomical vertical graft instead of more horizontal native ACL so that rotational instability persists although anteroposterior stability is good. Study conducted by Ganesh and associates concluded that non anatomical ACL fixation is the most common technical error resulting in recurrent instability of knee. Sastre et al. studied 40 patients and showed no difference between single and double bundle group. Chen and associates conducted meta-analysis study of randomized control studies of five years which showed good outcome with anatomical single bundle ACL reconstruction. Overall single bundle anatomical ACL reconstruction produces better clinical results to that of double bundle technique and it is less technically demanding procedure.

CONCLUSION:

Single bundle ACL reconstruction with hamstring tendon graft fixed at anatomical ACL footprints provides consistent good functional results.

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