

Clinical Profile of Patients with Anterior Cruciate Ligament Injury

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Abstract

Introduction: The ACL is the most important structure in the knee. The old name of anterior cruciate ligament was crucial ligament since cruciate or crossed arrangements of the anterior and posterior cruciate ligaments within the knee. The importance of the anterior cruciate ligament in the maintenance of joint integrity has been recently appreciated. *Methodology:* About 30 patients with anterior cruciate ligament injury attending the department of Orthopedics were included in the study. Clearance from Institutional Ethical committee was obtained before the study was started. An informed, bilingual consent was obtained from each patient before they were included in to the study. *Results:* In the PTB group, 53.3% of the patients had left sided ACL tear and 46.7% had right sided tear. In the STG group, 46.7% had left sided ACL tear and 53.3% had right sided ACL tear. *Conclusion:* The tears of the ACL present acutely or chronically and in the acute lesion the other ligaments may be clinically normal.

Keywords: Anterior Cruciate Ligament; RTA; Sports.

Introduction

Knee joint is the largest weight bearing joint of the body. The knee joint is supported by various ligaments which stabilizes the joint. The Anterior Cruciate ligament is a primary stabilizer of the knee joint against anterior translation of tibia on femur and it is also important in counteracting the rotation and valgus stress [1]. The injury to the anterior cruciate ligament results in knee instability. The injury to the anterior cruciate ligament is the most common and serious ligamentous injury of the knee joint [2,3]. This deficiency leads to recurrent injuries and increased risk of intra articular damage of the meniscus.

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arrangements of the anterior and posterior cruciate ligaments within the knee. The importance of the anterior cruciate ligament in the maintenance of joint integrity has been recently appreciated. The construction and design of the ACL are directly related to its function as a constraint of joint motion. From its orientation within the joint to the microanatomy of its insertion, the complex structure of the ACL reflects its important contribution to knee function.

Anterior cruciate ligament injury is a common athletic injury and one of the most commonly treated condition of the knee [4]. According to the statistics available, ACL rupture occurs at the rate of 60 per 100,000 people per year in the United States. The estimated rates of anterior cruciate ligament reconstructions performed per year in the United States range from 60,000 to 175,000 [5,6]. The literature pertaining the exact burden of ACL injury

in India is not known.

The tears of the ACL present acutely or chronically and in the acute lesion the other ligaments may be clinically normal. Amis and Scamell in 1993 have found that anterior displacement of the tibia sufficient to disrupt the ACL will leave the collateral ligaments unstretched, although the postero-medial and postero-lateral structures will be stretched. Non contact deceleration and sudden inward twisting of the knee may also cause, 'Isolated ACL' rupture, the patient experiencing a popping sensation in the knee approximately in half the cases. Hyperflexion with the tibia internally rotated may rupture either or both cruciates and forced hyperextension will cause varying severities of ACL tear. Combined injuries occur from impact over the side of the knee joint; the medial collateral structures are torn, followed by the ACL which angulates against the lateral femoral condyle. There may be associated meniscal injuries, patellar subluxation and osteochondral fracture.

Examination of the uninjured knee is very important. The amount of anterior translation of the tibia on femur with a firm manual force can vary between 5 and 15 cms. However, the right to left difference is less than 3mm in 95% of patients. The ability of the examiner to demonstrate abnormal anterior translation in a patient with torn ACL depends on the patient's relaxation, the precision of applied force, the ability of examiner to detect joint motion, and endpoint stiffness. In addition to the amount of translation, the quality of end point on anterior translator, whether firm or soft, is important in determining the status of ACL.

Methodology

About 30 patients with anterior cruciate ligament injury attending the department of Orthopedics were included in the study. Clearance from Institutional Ethical committee was obtained before the study was started. An informed, bilingual consent was obtained

from each patient before they were included in to the study. The inclusion and exclusion criteria were as follows,

Inclusion Criteria

- ACL injury in young active individuals with or without meniscus injury.
- Associated with symptoms of instability.
- In patients aged 15 -50 years.

Exclusion Criteria

- ACL injury in individuals associated with Osteoarthritis.
- ACL avulsion fractures and multi ligament injuries.
- In skeletally immature patients.

About 30 patients who satisfied the inclusion and exclusion criteria were divided in to two equal groups of 15 patients each. The type of graft tissue used for reconstruction (bone - patellar tendon-bone versus hamstring tendon autograft) was not randomized. Bone-patellar tendon- bone autografts were used for those who wished to return to high-level activities and hamstring tendon autografts for those who had low level activities or were concerned about cosmesis. The outcome testing in all cases was performed at the latest follow- up (at least one year).

Results

The mean age of patients in PTB group was 30.5 (\pm 7.5) years and STG group was 27.5 (\pm 9.3) years. This difference in the age was not statistically significant. About 40% of the patients in the PTB group belonged to 31-40 years of age, followed by 21-30 years (33.3%), and less than 20 years and 41-50 years (13.3%). In the STG group, 33.3% of the patients

Table 1: Distribution of the study groups according to age group

Age group	PTB group N (%)	STG group N (%)
Less than 20 years	2 (13.3)	4 (26.7)
21 - 30 years	5 (33.3)	5 (33.3)
31 - 40 years	6 (40.0)	5 (33.3)
41 - 50 years	2 (13.3)	1 (6.7)
Total	15 (100)	15 (100)
Mean \pm SD	30.5 \pm 7.5	27.5 \pm 9.3
T value	0.951	
P value, sig	0.35, NS	

Table 2: Distribution of the study groups according to surgery

Surgery	PTB group N (%)	STG group N (%)
ACL reconstruction	3 (20.0)	0
ACL reconstruction PTB + Meniscal repair	1 (6.7)	0
ACL reconstruction PTB + Partial Meniscectomy	11 (73.4)	0
ACL reconstruction STG	0	3 (20.0)
ACL reconstruction PTB + Partial Meniscectomy	0	12 (80.0)
Total	15 (100)	15 (100)

belonged to 21–30 years and 31–40 years. About 73.4% of the study subjects in the PTB group had undergone ACL reconstruction PTB with partial meniscectomy, 20% had undergone ACL reconstruction and 6.7% had undergone ACL

reconstruction PTB with Meniscal repair. In the STG group, 80% had undergone ACL reconstruction PTB with Partial meniscectomy and 20% had undergone ACL reconstruction STG.

Table 3: Distribution of the study groups according to side affected

Side	PTB Groupn (%)	STG group n (%)
Left	8 (53.3)	7 (46.7)
Right	7 (46.7)	8 (53.3)
Total	15 (100)	15 (100)

In the PTB group, 53.3% of the patients had left sided ACL tear and 46.7% had right sided tear. In the STG group, 46.7% had left sided ACL tear and 53.3% had right sided ACL tear.

In PTB group, 40% had ACL tear as a result of

activities of daily living, 33.3% had ACL tear due to road traffic accident and 26.7% had ACL tear due to sports. In STG group, 33.3% had ACL tear due to activities of daily living, 26.7% due to road traffic accident and 40% due to sports.

Table 4: Distribution of the study groups according to mechanism of injury

Mechanism of Injury	PTB group n (%)	STG group n (%)
Activities of daily living	6 (40.0)	5 (33.3)
Road traffic accident	5 (33.3)	4 (26.7)
Sports	4 (26.7)	6 (40.0)
Total	15 (100)	15 (100)

Discussion

Knee joint is the largest weight bearing joint of the body which is supported and stabilized by different ligaments. The Anterior Cruciate ligament is a primary stabilizer of the knee joint against anterior translation of tibia on femur and it is also important in counteracting the rotation and valgus stress [1]. Instability is the result due to injury of the anterior cruciate ligament which is the most common and serious [2,3]. This deficiency leads to recurrent injuries and increased risk of intra articular damage of the meniscus. Fast moving vehicles like motorcycle, foot ball, increased fitness awareness and highly competitive sports are the main reasons of the injury of the anterior cruciate ligament. Hyperextension of the knee joint is main mechanism involved in the injury of the anterior cruciate ligament. ACL reconstruction involves restoration of the stability of the joint and also allows patient to return to normal activities including sports and delay the onset of the

osteoarthritis.

Intra articular replacement of the torn ACL with a biologic graft has evolved to be most commonly used operation today [7]. The most commonly used autografts include bony patellar tendon or combined semitendinosus and gracilis hamstring tendon grafts for the better functional outcome. The decision of selecting the appropriate grafts for an individual patient depends upon the operating surgeon. The gold standard graft is not available. The autografts used for reconstruction of ACL include Bone patellar tendon bone, hamstrings, Quadriceps tendon and fascia lata. The available literature suggests that the bone patellar tendon – bone autograft is considered to be the gold standard in ACL reconstruction because of bone to bone healing which allows of early and accelerated rehabilitation with documented good and excellent long term results [8,9]. The hamstring tendon grafts have increased in popularity nowadays as an alternative to the bone patellar tendon bone graft. The advantages reduced donor site morbidity

associated with fewer kneeling problems and muscular deficits and less anterior knee pain in the long term follow up. Hence, this study was taken up in order to study the advantages and disadvantages of B-P T-B grafts with hamstring tendon graft.

The mean age of patients in PTB group was 30.5 (\pm 7.5) years and STG group was 27.5 (\pm 9.3) years. This difference in the age was not statistically significant which ensures the comparability between the two groups. Majority of the study subjects belonged to 31 – 50 years. In a similar study by Wagner et al, the mean age of Patellar tendon group was 33.6 years and Hamstring group was 31.1 years [10]. In a similar study by Martin et al, the mean age of the participants was 28.43 years [11]. In a similar study by Pathania et al¹², the average age was 27.8 years (20–39). A study had shown that the mechanical properties of the hamstring tendons seem to be preserved with increasing age, in contrast to the bone – patellar tendon – bone graft, which seems to weaken with age [13].

About 73.4% of the study subjects in the PTB group had undergone ACL reconstruction PTB with partial meniscectomy and 80% in STG group had undergone ACL reconstruction STG with Partial meniscectomy. No studies were available to compare these results.

In the PTB group, 53.3% of the patients had left sided ACL tear and in STG group, 53.3% had right sided ACL tear. No similar studies were available for comparison of the results of this study.

In PTB group, 40% had ACL tear as a result of activities of daily living and in STG group 40% ACL tear was due to sports. In a study, Pathania et al also reported 44% of the injuries were due to sports like football, basketball, kabaddi, horse riding and gymnastics [13].

Conclusion

In PTB group, 40% had ACL tear as a result of activities of daily living, 33.3% had ACL tear due to road traffic accident and 26.7% had ACL tear due to sports. In STG group, 33.3% had ACL tear due to activities of daily living, 26.7% due to road traffic accident and 40% due to sports.

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