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Dr. Shivaraj AC
Assistant Professor,
Mahadevappa Rampure Medical College, Kalaburagi, Karnataka, India

Dr. Ismail Shaikh
Consultant Orthopaedic Surgeon,
Asilo Hospital, Mapusa, Goa, Inida

Correspondence
Dr. Ismail Shaikh
Consultant Orthopaedic Surgeon,
Asilo Hospital, Mapusa, Goa, India

A comparative study between transtibial and anatomical arthroscopic anterior cruciate ligament reconstruction of knee

Dr. Shivaraj AC and Dr. Ismail Shaikh

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Abstract
Introduction: Knee injuries are very common due to sports and repetitious activities. Of these ACL injuries are the most common. Surgical treatment with ACL reconstruction has now become gold standard in management of ACL injury.
The main aim in anterior cruciate ligament surgery is to reproduce the normal kinematics of the knee and provide stability in the sagittal and coronal plane. There is better patient satisfaction associated with better stability and kinematics. The objective of our study is to compare the results of outcome following ACL reconstruction using the transtibial and the anatomical technique or femoral tunnel placement.
Results: Out of 50 cases 38 were males 12 were females. Right knee was commonly involved compared to left accounting for 52% cases. Young patients between 17 and 35 years constituted the maximum number who suffered from ACL injuries. 60% of cases were due to motor vehicular accidents (MVA). Post injury there was an average fall of 50% in activity levels as compared to pre injury levels in both the groups. The patients in anatomical group attained 86.36% of pre injury activity level on an average, while those in transtibial group achieved 63.87%, a difference of 25.56%. There was a difference of a significant 19.40% in both group Lysholm Tegner Knee score with anatomical group having 90.92% and transtibial having 73.28% of score.
Interpretation and conclusion: The anatomical ACL reconstruction group performed better in subjective outcome of Lysholm Tegner Knee Score as well as in achieving greater percentage of pre injury activity level as compared to the transtibial group of ACL reconstruction. Hence anatomical placement of femoral tunnel using anteromedial accessory portal is a better surgical option when compared to transtibial femoral tunnel placement in ACL reconstruction surgeries to achieve a more near normal knee kinematics.

Keywords: ACL, Anatomical reconstruction, Transtibial, Arthroscopic

Introduction
The anterior cruciate ligament, or ACL, is one of four major knee ligaments. The ACL is critical to knee stability, and people who injure their ACL often complain of symptoms of their knee giving-out from under them. Therefore, many patients who sustain an ACL tear opt to have surgical treatment of this injury.
The anterior cruciate ligament, also called the ACL, is one of the four major ligaments of the knee. The ACL prevents excessive motion of the knee joint of patients who sustain an injury to their ACL may complain of symptoms of the knee & quot; buckling. & quot;
Injury to ACL is the most common ligament injury in the knee. Western literature quotes around 2, 00,000 ACL injuries per year (U.S). Indian statistics quote this to be at 50,000 per year but with rise in sports activities among the country's youth these figures are bound to rise.
An ACL tear is most often a sports-related injury. ACL tears can also occur during rough play, motor vehicle collisions, falls, and work- related injuries. About 80% of sports-related ACL tears are & quot; non-contact & quot; injuries. This means that the injury occurs without the contact of another athlete, such as a tackle in football. Most often ACL tears occur when pivoting or landing from a jump. The knee gives-out from under the athlete when the ACL is torn.

Aims and objectives

- To study the method of Arthroscopic Transtibial anterior cruciate ligament reconstruction of Knee using hamstring graft.
- To study the method of Arthroscopic Anatomical anterior cruciate ligament reconstruction of Knee using hamstring graft.
- To study the functional outcome of Arthroscopic Transtibial anterior cruciate ligament reconstruction of Knee.
- To study the functional outcome of Arthroscopic Anatomical anterior cruciate ligament reconstruction of Knee.
- To compare the outcome in above mentioned groups using Tegner Lysholm Knee scoring scale and the Tegner Lysholm activity scale.

Materials and methods

This is a prospective and a retrospective comparative study of 50 patients observed for six months to one year post operatively following ACL reconstruction. Transtibial and Anatomical technique of femoral tunnel placement was used in 25 patients each randomly. The surgeries were performed between 2008 and 2010.

Inclusion criteria

- Age between 18 and 45 years.
- Injury to anterior cruciate ligament with intact posterior cruciate ligament.
- Associated minor injuries to medial collateral ligament, meniscus injury.

Exclusion criteria

- Age beyond inclusion range
- Associated major ligament injuries like posterior cruciate ligament injury.

Results and analysis

Table 1: Sex distribution

	Transtibial	Anatomical	Total
Male Count	19	19	38
Percentage%	76	76	76
Female Count	6	6	12
Percentage%	24	24	24
Total Count	25	25	50
Percentage	100	100	100

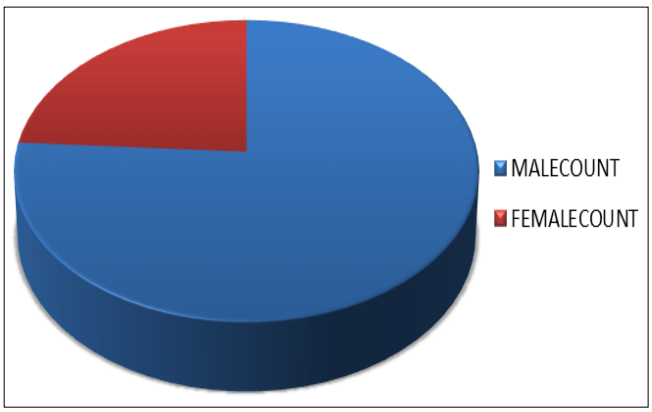

Fig 1: 76% of patients were male. The male female distribution was same in both the groups. Graphical Depiction

Descriptive Statistics

Age Distribution: in years.

Table 2: 76% of patients were in age group of 20-35 years

Total	Minimum	Maximum	Mean
50	17	51	27.9

Table 3: 76% of patients were in age group of 20-35 years

Age (Years)	Number	Percentage
<20	3	6
20-25	19	38
26-30	14	28
31-35	5	10
36-40	4	8
41-45	3	6
46-50	1	2
51-55	1	2
Total	50	100

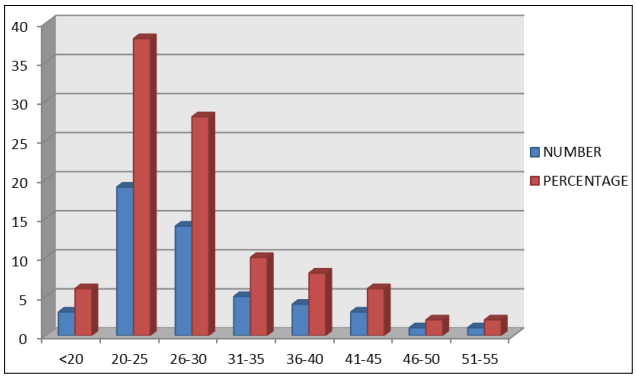

Fig 2: Graphical representation

Summary

A comparative study prospective as well as retrospective of ACL reconstruction using Transtibial and Anatomical technique of femoral tunnel placement has been presented with 25 patients in each group.

A review of literature of the ACL reconstruction, with special reference to femoral placement of tunnel, either using transtibial or anatomical (via accessory medial portal) has been presented.

ACL injuries are often seen in young active patients of both sexes with more predominance in males (76% in our study). 72% of patients were below the age of 30 years.

Interestingly 60% of injuries were due to motor vehicular accidents. Both knees were equally involved with a slight predominance of Right side (52%).

Young active patients performed better then sedentary workers in achieving pre injury activity levels. In the anatomical groups patients achieved 86.36% of pre injury activity levels on an average while the same average for transtibial group was 63.87%. Hence there was a difference of 25.56% in the two averages. This meant that the patients in anatomical group recovered better.

Conclusion

Major injuries of the ligamentous structures of the knee joint are being increasingly reported. Vehicular accidents account for 60% of the cases in our series.

Advances in imaging modalities and arthroscopy have contributed to better understanding of the derangement patterns and in diagnosis of associated intra articular injuries.

Surgical treatment with ACL reconstruction has now become

gold standard in management of ACL injury. Young active individuals should be offered early surgical intervention for ACL reconstruction to minimize the progressive damage to intra articular structures and prevent arthrosis.

There has been a renewed focus on anterior cruciate ligaments insertional anatomy and its biomechanics. It has been postulated that traditional single bundle transtibial reconstructions have placed grafts in a less anatomic location to the true ACL insertion site. In traditional transtibial technique, the femoral tunnel is predetermined by the position of tibial tunnel. Achieving the most anatomic position for the graft requires the femoral and tibial tunnels to be drilled independently. Use of the accessory medial portal technique provides us with more flexibility in accurately placing the femoral tunnels in the true ACL insertion sites as compared with transtibial technique. Advantages include anatomical tunnel placement, easy preservation of any remaining ACL fibers when performing ACL augmentation procedures, and flexibility in performing either single or double bundle reconstruction. This technique is not limited by the choice of graft or fixation and offers the advantage of true parallel screw placement through the same portal as that used for tunnel drilling in case of interference fixation.

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