A Study On Clinical Profile Of Patients With Complete Acl Tear Admitted At A Tertiary Care Hospital

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Abstract:
Analysis of knee motion in a horizontal plane reveals a different type of motion that of internal femoral condylar motion with terminal knee extension. This is called "Screw Home" mechanism which offers greater stability. This mechanism is due to the inequality of bony geometry between femoral condyle and tibial plateau. Detailed history about the trauma and mode of injury was taken in the casualty/OPD. Case history was recorded in a specially designed Case Record Form (CRF) by taking history of illness and by doing detailed clinical and radiological examination and relevant investigations. Finally, after the diagnosis, patients were selected for the study depending on the clinical instability and MRI findings and based on the inclusion and exclusion criteria. The most common symptom at presentation was instability (36.66%) followed by knee pain (33.33%). Both knee pain and instability were present in 23.33% of patients.

Keywords: Clinical Profile, Complete ACL Tear, Knee Pain And Instability

Introduction:
A ligament exerts its function by elongating. The force produced by elongation depends upon the mechanical properties of the ligament. The ACL exerts visco-elastic properties and the strength of normal ACL ranges from 1760 N to 2160 N. Both cruciate ligaments perform the function of a true gear mechanism and form the nucleus of the knee joint kinematics.[1]
In a sagittal plane the knee moves by a combination of rolling and gliding motion, which are referable to the shape of femoral condyle which in the sagittal plane, are eccentrically curved. Anteriorly the femoral condyle are flatter, posteriorly they are more curved. Rolling is predominantly in the early degree of flexion corresponding to the more oval curvature of the condyle. Gliding motion prevails in the latter degree of flexion, where the femoral condyle is more spherical and offers less surface contact with the tibial plateau.[2]
The anteromedial fibers of anterior cruciate ligaments are tense principally in flexion while the posterolateral fibers in increasing tension as the knee is extended. The reciprocal relationship of this bundle constitutes a twist within the anatomy of this single ligament and provides for stability throughout the entire arc of knee motion.[3]
Analysis of knee motion in a horizontal plane reveals a different type of motion that of internal femoral condylar motion with terminal knee extension. This is called "Screw Home" mechanism which offers greater stability. This mechanism is due to the inequality of bony geometry between femoral condyle and tibial plateau.[4]
The internal tension of anterior cruciate ligament is not constant throughout the arc of knee joint motion. It is taut in between 20 degree 70 degree, being most lax at 40 degree of flexion. From 70 degree to 90 degree the ligament increases in tension. Anterior tibial displacement on the femur in neutral rotation and flexion cannot be elicited unless the anteromedial bundle is torn. At 30 degree and 90 degree flexion, 85% of restraining force to anterior tibial displacement is provided by anterior cruciate ligament. The Rotational, Valgus and Varus stability is a secondary function of the anterior cruciate ligament.[5,6]
Thus any repair or reconstructive procedure in the anterior cruciate ligament must adhere to both anatomical and biomechanical criteria with proper isometric position and tension.

Methodology:
- The proposed study was a hospital based study in Patients attending to the Department of Orthopaedics who are diagnosed with ACL injury and fulfilling the said criteria and willing for the surgery & study will be included in the study.
- No. of cases – 30

METHOD OF COLLECTION OF DATA:
- Detailed history about the trauma and mode of injury was taken in the casualty/OPD.

- Case history was recorded in a specially designed Case Record Form (CRF) by taking history of illness and by doing detailed clinical and radiological examination and relevant investigations.
- Finally after the diagnosis, patients were selected for the study depending on the clinical instability and MRI findings and based on the inclusion and exclusion criteria.
- All routine blood investigations were sent and a pre-anesthetic check-up was done regarding fitness for the surgical procedure.
- All patients were taken for surgery only after an informed and written consent was obtained from the patient and the patient's attender.
- 30 cases with ACL injury were studied as per the inclusion and exclusion criteria.
- Post operative evaluation of clinical and functional outcome using the Lysholm questionnaire and scoring system was done. All the cases are followed for the minimum period of 6 months to 12 months. Results were analyzed both clinically and radiologically using appropriate statistical methods.

Inclusion Criteria:

- Patients with clinical and radiological evidence of complete ACL injury with instability.
- Patient aged between 20 to 50 years.

Exclusion criteria:

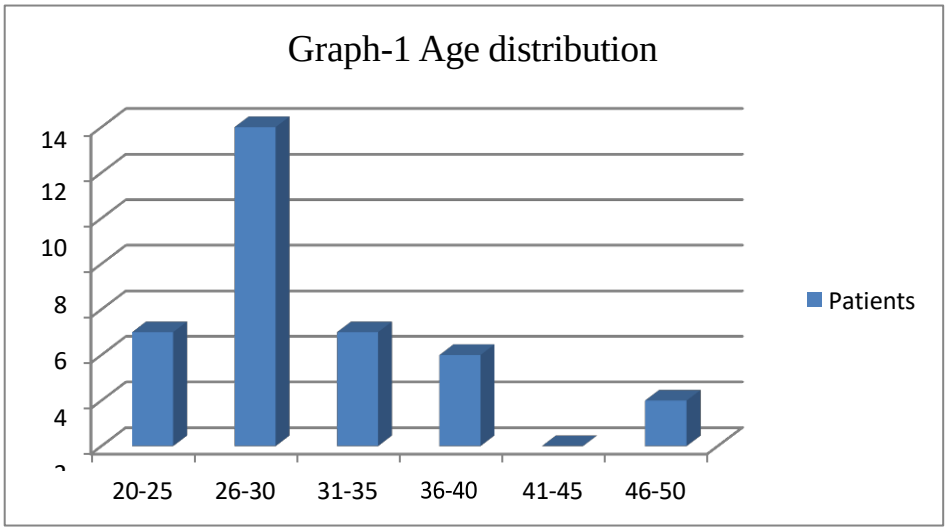
- Associated bony avulsion injuries.
- Patients with recurrent ACL tears.
- Patients requiring a concurrent meniscal and cartilage repair.
- Associated with other ligament injuries requiring surgery.
- Osteoarthritic knee.
- Patients with chronic diseases such as diabetes.

Results:

Table 1: Age distribution

Age(years)	Patients	Percentage
20-25 years	5	16.66%
26-30 years	14	46.66%
31-35 years	5	16.66%
36-40 years	4	13.33%
41-45 years	0	0
46-50 years	2	6.66%

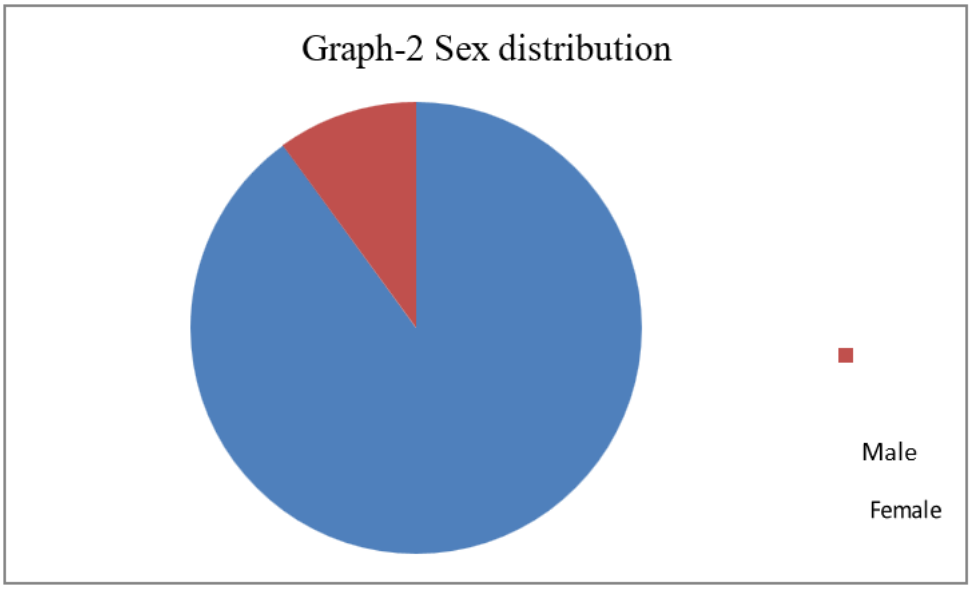
The youngest patient in our study group was 22 years and the oldest one 48 years. The mean age in our study group was 30.6 years.



Most of the patients (46.66%) were in the age group of 26 to 30 years.

Table 2: Sex distribution

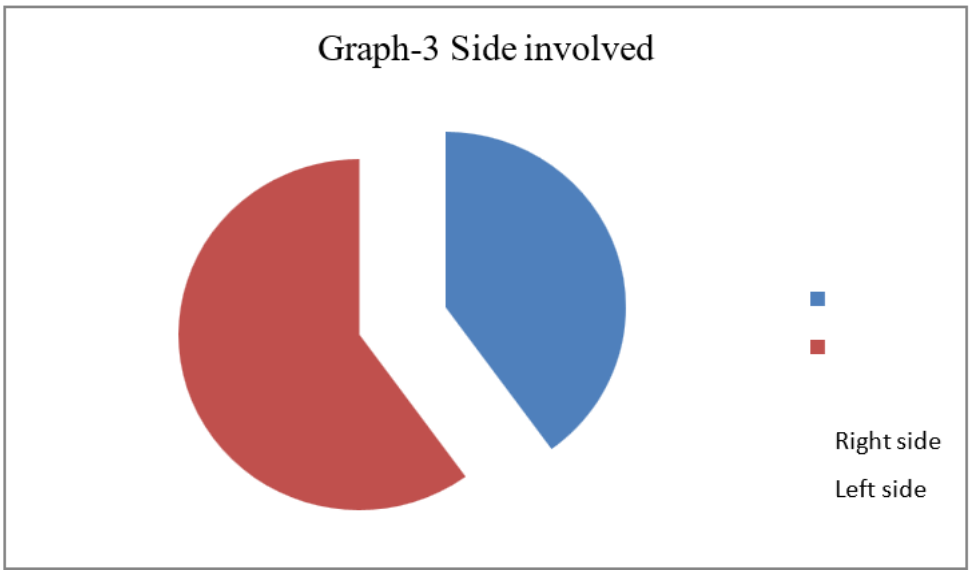
Gender	Number of patients	Percentage
Male	27	90%
Female	3	10%
Total	30	100%



Of the 30 patients included in our study, 27 (90%) were Male patients and 3 (10%) were female.

Table 3: Side involvement

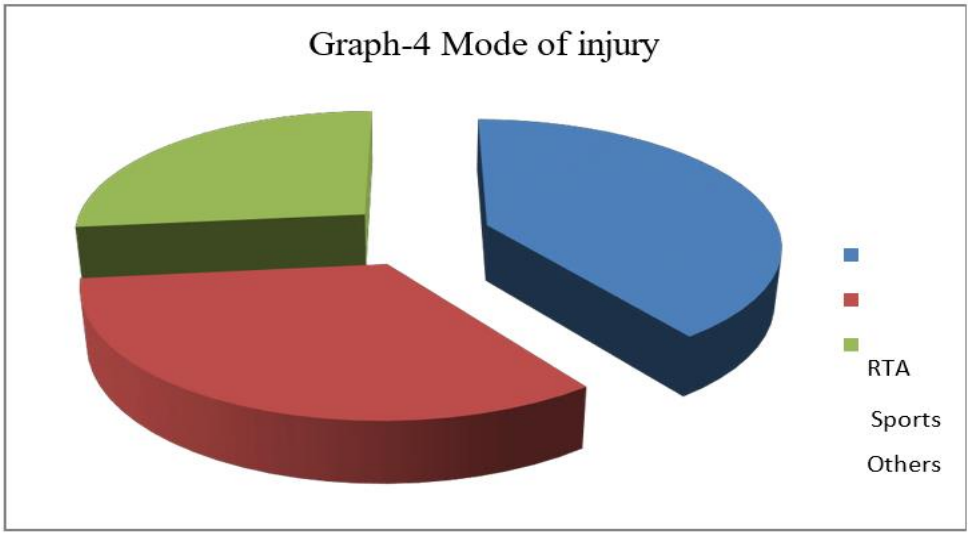
Side involved	Number of patients	Percentage
Right side	12	40%
Left side	18	60%
Total	30	100%



In this study, the left side was more commonly injured (60%) than the right side (40%).

Table 4: Mode of Injury

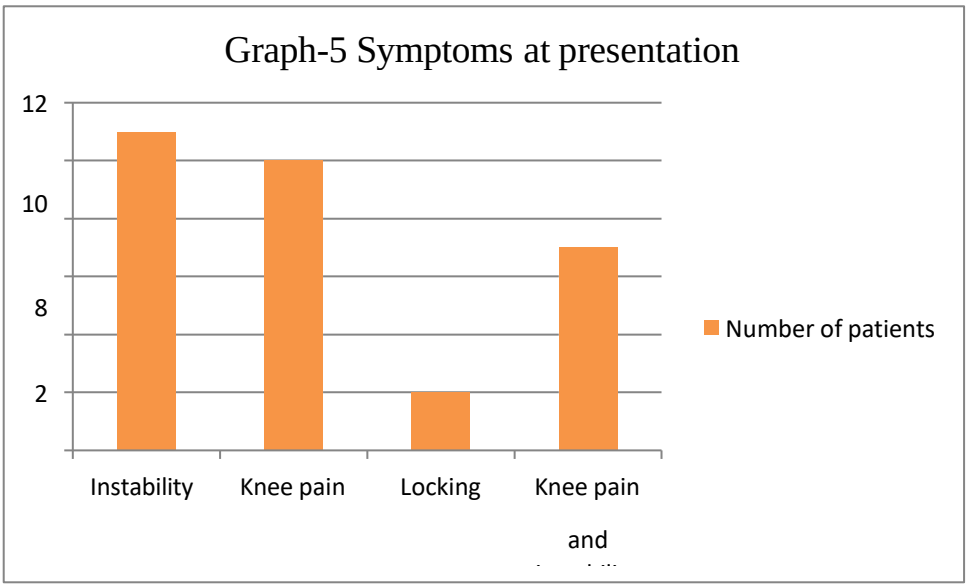
Mode of Injury	Number of patients	Percentage
RTA	12	40%
Sports	10	33.33%
Others	8	26.66%
	30	100%



Slightly higher incidence of ACL injury was due to Road Traffic Accidents (40%) compared to sports injury (33.33%). The other modes of injury in our study were self fall and fall from height.

Table 5: Symptom at presentation

Symptom at presentation	Number of patients	Percentage
Instability	11	36.66%
Knee pain	10	33.33%
Locking	2	6.66%
Knee pain and instability	7	23.33%
	30	100%



The most common symptom at presentation was instability (36.66%) followed by knee pain (33.33%). Both knee pain and instability were present in 23.33% of patients.

Discussion:

Age incidence: 16.66% of the patients were in the age group of 20-25 years, 46.66% in the age group of 26-30 years, 16.66% in the age group of 31-35 years, 13.33% in the age group of 36-40 years, 6.66% in the age group of 46-50 years. Average age of patients at the time of surgery in the present study was 30.6 years. The range of age was 22-48 years. The mean age is comparable with the study of Johma et, D Choudhary et al, Riley et al., Mahir et al and Kumar et al.

Table 6: Comparison of Age

Study	DChoudhary et al. (2005)[7]	Jomha et al. (1999)[8]	Riley et al. (2004)[9]	Mahir et al. (2005)[10]	Ashok Kumar et al.(2016)[11]	Present study
Mean age (years)	26	27	33	24	27	30.6

As in other standard studies, the present study had higher number of males. There were 27 male patients (90%) and 3 female patients(10%). This is comparable to sex ratio of most of the studies in which the incidence has been shown to be more in males.

Table 7: Comparison of Gender

Study	D Choudhary et al. (2005)	Jomha et al. (1999)	Riley et al. (2004)	Mahir et al. (2005)	Ashok Kumar et al.(2016)	Present study
Male preponderance	73%	93%	59%	100%	97.1%	90%

In our study, slightly higher incidence (40%) of ACL injury was due to Road Traffic Accident. 33.33% of patients sustained the injury due to sports and 26.66% of patients due to self fall and fall from height. Among the sports injuries, cricket and football were the common cause of ACL tear in our study.

The Right knee was involved in 12 (40%) patients and left knee in 18 (60%) patients in our study.

D.W Lewis et al.[12], in their study on incidence of meniscal injuries at the time of ACL reconstruction found that 58% of patients had meniscal injuries and that medial meniscus was most commonly injured.

In our study, there was associated meniscal injury in 60 % of patients. Twelve patients in our study had isolated ACL injury. Eleven patients had injury to the medial meniscus whereas five patients had injury to the lateral meniscus alone. Two patients had injury to both the medial and lateral meniscus. The most commonly injured was medial meniscus which was in accordance with other studies. Type of meniscal injuries and management is beyond the scope of this study.

Among the patients with meniscal injuries, ten patients were treated by partial meniscectomy. The rest of the patients were treated conservatively. The functional outcome of patients with isolated ACL injury was

comparable with that of the patients with associated meniscal injuries. Requiring meniscectomy was unlikely to affect the outcome largely.
The most common symptom at presentation was instability (36.66% of patients). The other presenting symptoms were knee pain (33.33%), locking (6.66%) and 23.33% patients presented with both pain and instability.

Conclusion:
The average age of the study patients was 30.6 years. 90% of the total patients were males with involvement of left knee in 60% of the total cases and right knee in 40% of the total cases. All the patients were operated under spinal and or epidural anesthesia.
There were 2 cases of knee stiffness, one case of knee effusion and one case with donor site pain.

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