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OUTCOMES AND PREDICTORS OF SUCCESS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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ABSTRACT

Background: Anterior cruciate ligament (ACL) tears are the most prevalent and common knee ligament injuries in the world of orthopedics. The purpose of ACL reconstruction is to optimize knee biomechanics of the patient so that he can return to demanding sports. Moreover, the aim involves minimizing the risk of further damage to menisci and articular cartilage. This study is aimed at the determining outcomes and predictors of success after anterior cruciate ligament reconstruction. **Methods:** A total of 150 patients were selected randomly in the study. All patients included were between the ages of 17 to 40 and in the category of 'low risk' patients. Patients were both males and females. Patients participating in the study were counselled appropriately and a written consent was taken from them. Moreover, patients selected were volunteers and agreed to be part of the study. **Results:** Since it was a procedure that had to be done in the operation theatre, specialized anesthesia care was arranged and coordinated with for every procedure. Patients who are young in age tend to adapt well to the ACLR and have decreased complications and increased return-to-activity rates. Moreover, people who have high demanding sports activities have slightly increased risks of complications.

Keywords:

INTRODUCTION

Anterior cruciate ligament (ACL) tears are the most prevalent and common knee ligament injuries in the world of orthopedics. The age group mostly effected in this condition is younger people who are more active, making them at highest risk. As knee is a weight bearing joint, these injuries can result in impairment of function of the injured knee. This is more evident in competitive sports. (1) Another scenario to keep in mind is a noncontact ACL injury which is cause by multiple mechanism. It is common in persons who lack dynamic knee joint stability. (2,3,4) In such patients, fatigue or exertion decreases vertical ground reaction force of the hip and knee joint movements. This results in translation of the tibia anteriorly. The standard care treatment that a patient is given who has undergone a ruptured ACL, specifically who has a high demand of the ligament, is an anterior autograft reconstruction of the injured or damaged ligament.(5) About 175,000 to 200,000 ACL reconstructions are carried out in the United States per year.(6) The purpose of ACL reconstruction is to optimize knee biomechanics of the patient so he can return to demanding sports. Moreover, the

aim involves minimizing the risk of further damage to menisci and articular cartilage. The rationale is to restore knee biomechanics, thus allowing patients to return to cutting and pivoting sports, as well as minimizing the risk of subsequent menisci and articular cartilage damage, and potentially retarding the process of posttraumatic knee joint osteoarthritis. With an increasingly active population and increased numbers of injuries, emphasis needs to be placed on high-quality research related to ACL reconstruction, rehabilitation, and prevention to establish patient-specific predictive models of clinically important outcomes. Anterior cruciate ligament injury has been linked with various risk factors as predictors of the injury. These include sex of the patient, age and the sports played. Moreover, the factor that strenuous exertion is part of the patient's daily routine is also taken into account. According to various studies conducted, these factors play effects on the outcomes of anterior cruciate ligament reconstruction. The incidence of ACL injury has been reported to be higher in patients who are females (7,8), are younger in age(9) and play sports that involve frequent cutting or landing maneuvers. These sports include basketball, field hockey, volleyball, football and ice hockey.(10) When observing the effectiveness of an anterior cruciate ligament reconstruction effectiveness, reoperative rate, functional tests, rerupture rate, return-to-sports (RTS) rate, objective tests and visual analog scale (VAS) pain scale are considered. According to many studies carried out over years, risk factors like athletic ability, graft, age, surgical technique and rehabilitation program play a pivotal role in the outcome and success of ACLR. (10) A big debate has been sex of the patient. It has been evidently declared differences based of sex of the patient have no significant outcomes after ACLR. (11)

METHODS AND MATERIALS

This was a retrospective cohort study that was conducted in Hayatabad Medical Complex, Peshawar over a span of 18 months (January 2023 to June 2024). Approval of the study was acquired from the Ethical Committee for Academic Research and Projects. All patients included were between the ages of 17 to 40 and in the category of 'low risk' patients. Patients were both males and females. Patients participating in the study were counselled appropriately and a written consent was taken from them. Moreover, patients selected were volunteers and agreed to be part of the study. Patients who were above 40 years of age, those who were at a high-risk due to some co-morbidities (high-risk patients), patients not willing for being part of the study, patients having deep venous thrombosis were excluded from the study. Every procedure was carried out under direct supervision of the supervisor.

TECHNIQUE:

Each patient was prepared according to standard operation procedures (SOP) required for carrying out anterior cruciate ligament reconstruction. Patient was given spinal/regional anaesthesia and aseptic measures were taken.

RESULTS:

A total of 150 patients were included in the study. Ages of patients ranged between 17 to 40 years with a mean age of 29 years. There were 100 (66.7%) males and 50 (33.3%) females in the study with a male to female ratio of 2:1. Since it was a procedure that had to be done in the operation theatre, specialized anaesthesia care was arranged and coordinated with for every procedure. Patients who are young in age tend to adapt well to the ACLR and have decreased complications and increased return-to-activity rates. Moreover, people who have high demanding sports activities have slightly increased risks of complications.

Table 01: Age Differentiation in ACL Reconstruction

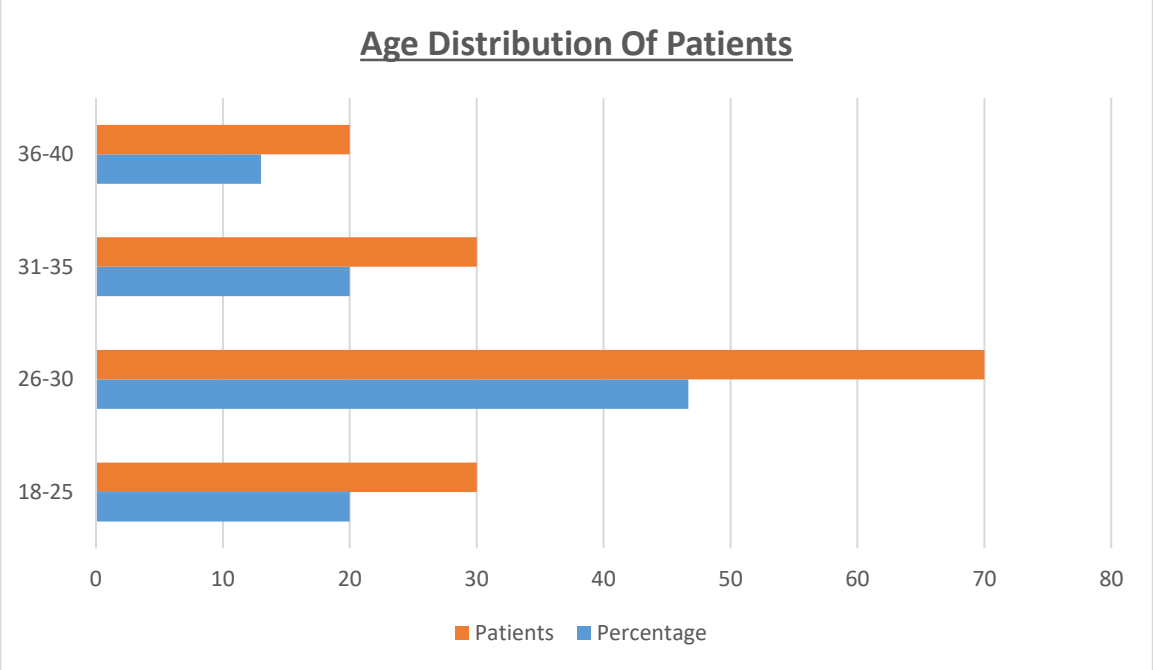
S#	Age Range	Number Of Patients	Percentage
1	17 – 25	30	20
2	26 – 30	70	46.67
3	31 – 35	30	20
4	36 – 40	20	13.33

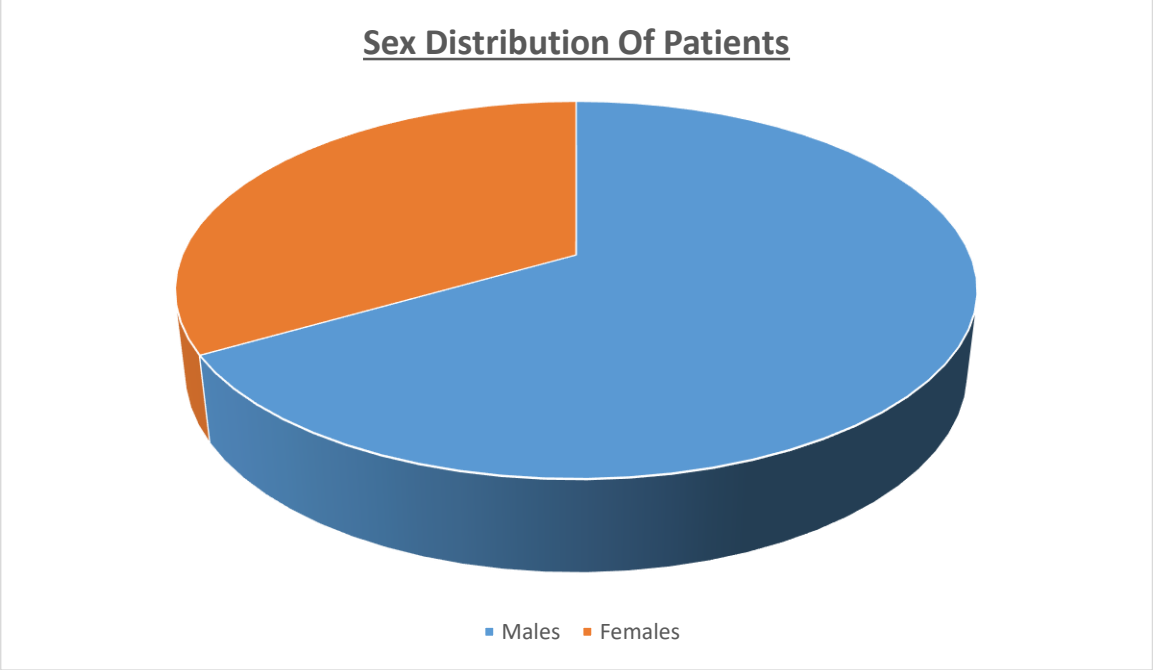
Table 02: Sex Differentiation In ACL Reconstruction

S#	Sex	Number Of Patients	Percentage
1	Male	100	66.67
2	Female	50	33.33

Table 03: Adaptation To ACLR

S#	Age (Yrs)	Adaptation
1	Between 18 – 30	More
2	Between 31 – 40	Less





DISCUSSION:

Anterior cruciate ligament reconstruction is a surgical technique which involves tissue graft replacement of the anterior cruciate ligament located in the knee. The main aim of this procedure is to restore the function of the knee which may be hampered after an injury. The ligament that is torn

can either be removed from the knee or preserved. In the later scenario, the graft is inserted inside the preserved ruptured native ligament. Reconstruction is an arthroscopic procedure and is carried out under strict aseptic conditions and under specialized anaesthesia care. The predictors of success of ACLR are various in number and include the likes of age and physical ability and outcomes are assessed on reoperative rate, functional tests, rerupture rate, return-to-sports (RTS) rate, objective tests and visual analog scale (VAS) pain scale.

CONCLUSION:

ACLR outcomes are better in younger adults and people with lesser strenuous activities.

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