

Original Article

ANTERIOR KNEE PAIN SIX MONTHS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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ABSTRACT

Background: Pain at the anterior part of the knee is one of the major complications besides others that are associated with anterior cruciate ligament (ACL) reconstruction. Prevalence of anterior knee pain varies with the site of graft chosen for ACL reconstruction, with high prevalence when bone-patellar tendon-bone (BPTB) is used as autograft. The objective of the study was to determine the number of patients with anterior knee pain associated with ACL reconstruction after six months of surgery.

Material and methods: It was a cross-sectional study in which 81 patients undergoing ACL reconstruction were included as per inclusion and exclusion criteria. All patients included in the study were male with the same baseline characteristics, patients were assessed using an anterior knee pain scale (AKPS) six months of reconstruction surgery.

Results: Mean age of patients was 30.8 years, Range 17 years to 60 years out of 81. Patients with no history of pain were 35 (43.2%). The pain was occasionally severe in 28 (34.6%) patients.

Conclusion: Almost 60% of the cases post ACL reconstruction with bone-patellar tendon graft complained of anterior knee pain of mild to moderate severity even after six months of reconstruction according to the anterior knee pain scale (AKPS).

Key Words: Anterior Cruciate Ligament, Pain, Patients

INTRODUCTION

Ligaments provide static as well as dynamic stability across every joint of the human skeleton. The anterior cruciate ligament has a stabilizing effect at the knee joint, preventing anterior translocation of the tibia. Damage as a result of trauma to this ligament commonly results in instability and functional loss at the knee joint. Conservative management and surgical reconstruction of the anterior cruciate ligament is usually done to regain its normal function. Reasons behind anterior knee pain after ACL reconstructive surgery are chronic ligamentous laxity, femoral and tibia tunnel

malposition, mal-tracking, and failure of fixation; They play an important role as main causes for knee pain leading to failure of ACL reconstruction.¹

Intramedullary nailing of the tibia is another common cause of anterior knee pain, a major complication of this open surgical procedure. Dissection of the patellar tendon and its sheath during nailing is thought to be a contributing cause of chronic anterior knee pain; other causes may include athletic activities, falls, automobile accidents, and hyperlaxity of the knee joint. Similarly, shortening of quadriceps with impaired length-tension relationship show decreased motor unit recruitment and loss of significant patellar stability which had a close association with new cases of patellofemoral pain. The latter four parameters play a dominant role in generating anterior knee pain and are risk factors for this syndrome.²

Prevalence of anterior knee pain after ACL reconstruction is 30% when the BPTB is used

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as autograft and 48% when the hamstrings tendon is used as a graft.³ Reconstruction surgery of anterior cruciate ligament (ACL) is common in the adolescent. Time taken between ACL rupture and surgical reconstruction is related to concurrent meniscal tear incidence and possibly tear pattern. The administration of Nonsteroidal Anti-inflammatory Drugs (NSAIDs) to patients undergoing anterior cruciate ligament reconstruction surgery is subject to controversy owing to the impairment it causes in tissue healing and clinical outcomes.⁴

It also has been suggested that anterior knee pain is related to the type of graft chosen for reconstructive surgery. Mainly two graft options are available i.e. hamstring tendon (HT) and bone BPTB. Anterior knee pain is more common after ACL reconstruction using (BPTB) than by using Hamstring Tendon (HT). Post-operative complications of ACL reconstruction include prolonged knee stiffness, limitation of complete extension, and pain at the anterior section of the knee. Emphasis on getting complete knee extension (terminal knee extension) on the first postoperative day and weight-bearing training from the very first day according to the patient's tolerance decrease complications to some extent.

The objective of the study was to explore the number of patients who complain of anterior knee pain after bone tendon-bone graft open ACL reconstruction so that early measures could be taken to reduce the development of this complication and improve patient's performance.

To describe the percentage of patients with anterior knee pain associated with open ACL reconstruction with bone-patellar tendon-bone graft, six months post-operatively.

MATERIAL AND METHODS

The non-probability convenience sampling technique was used for this cross-sectional study carried out at Ghurki Trust Teaching

Hospital Lahore. The sample size was 81 with 30% prevalence ($p < 0.01$ precision (d) and 95% confidence interval (1-a). Patients were distributed into age groups. The frequency of patients was 31 for 17-25 age group 15 for 26-35 age group and 24 for 36-45-year age group. The highest (31) frequency lies in the 17-25 age group.

The patients were recruited as per the inclusion criteria. Subjects with 6 months after ACL reconstruction surgery with bone-patellar tendon-bone graft. Patients having neurological deficits, vascular problems, active neoplasm, and bone tumors were excluded from the study. Assessment Tool: Anterior Knee Pain Scale (AKPS) was used with test-retest reliability AKPS-0.95 with CI=95%.

Permission from the institutional ethical committee was obtained to carry out the study. The duration study was only six months.

RESULTS

According to the anterior knee pain scale, out of 81 patients, no one had severe anterior knee pain. 16 (19.8%) patients had moderate anterior knee pain and 30 (37%) patients had mild anterior knee pain. The frequency of patients without anterior knee pain was 35 (43.2%). (Table-1, Figure-1)

Table-1. Frequency of Knee pain according to AKPS.

Anterior Knee Pain Scale	Frequency	Percentage
Severe Knee pain (0-30)	0	0.00
Moderate Knee Pain (31-60)	16	19.8
Mild Knee Pain (61-80)	30	37.0
No Knee Pain (81-95)	35	43.2
Total	81	100.0

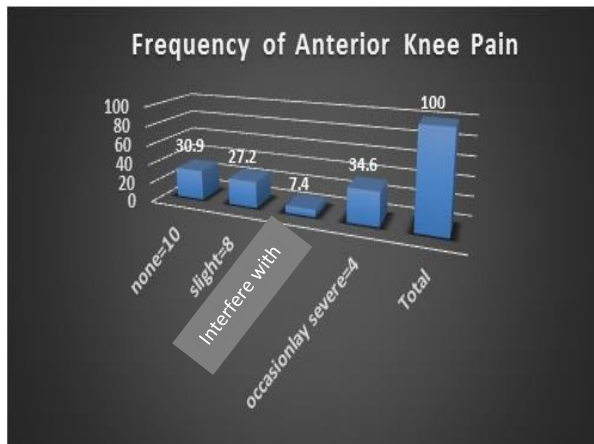


Figure 1. Out of 81 patients, 30.9% had no anterior knee pain, 27.2% patients had slight anterior knee pain, 7.4% patients had pain interfering with sleep and 34.6% had occasionally severe anterior knee pain.

DISCUSSION

Important satisfactory results were found in the present study, where no pain was found in 35 subjects (43.2%). Among the patients complaining of pain, no patient complains of severe pain, whereas 8 subjects reported pain at rest, or with activities varying from mild to strenuous activities of daily living. Studies upon anterior knee pain state that incomplete or non-fulfillment of expectations to manage pain after major surgeries result in anxiety leading to more pain, but measures are taken at the earliest to make it possible to reduce anxiety among patients. Involved interventions are ROM exercises, regaining terminal knee extension.⁵

The anterior cruciate ligament has a stabilizing effect at the knee joint, preventing anterior translocation of Tibia. Damage as a result of trauma to this ligament commonly results in instability and functional loss at the knee joint. Injury to the anterior cruciate ligament most commonly occurs during athletic activities and automobile accidents. Young adults most commonly undergo the procedure of anterior cruciate ligament reconstruction.

Studies have also shown that stabilization training of not only knee but hip and core

stabilization exercises are also important to post knee joint surgeries. The conventional treatment protocol that involves avoiding achieving terminal knee extension is not supported by studies claiming it has no destabilizing effect on operated knee. Supporting the idea that early intervention must be taken to meet the outcomes after the surgical procedure. Joint osteoarthritis can occur due to pain which can categories into three forms mild, moderate, severe, and biomechanical changes leading to impaired arthrokinematics.⁸ Anterior Tibia translation was found similar for the reconstructed and sound limb however, the reconstructed limb was also more adducted. Although small differences were found, but they were consistent in all subjects. At 2 years post-ACL-reconstruction (injured) knee showed greater medial compartment mobility because of pivoting about a more on lateral KCOR ($p=.03$) than the contralateral knee.⁹ Risk factors for graft failure include returning to a high activity level post ACL reconstruction and using an allograft.¹⁰

A hypothesis has proposed that the mechanism for ACL injury is valgus loading as well as lateral compression generating internal rotation motion and anterior translation of tibia, due to the joint symmetry, causing ACL damage.¹¹ Knee motion and knee loading during a landing phase are predictors of anterior cruciate ligament injury risk in female athletes.¹² The intensity of pain was not associated with either operative technique, any adjoining lesions, or methods used to treat them. Neither surgical technique nor concomitant lesions and methods used to treat them.¹³ Knee flexor and extensor peak torque values were found greater in subjects undergoing postoperative rehabilitation in their reconstructed limbs in comparison to parents treated by usual care.¹⁴ Physical training with stabilization training plays a vital role in the early rehabilitation of patients post ACL reconstruction surgery. The role of

Kinesio taping is important in improving swelling, night pain, and flexion range of motion.¹⁵

Van Jonbergen et al. have concluded in a systematic review that re-construction surgery can be done when indicated without any harmful outcome associated with it. Various studies were included that compared pain between inpatients and outpatients after one to two years of ACL reconstruction surgery by using the Visual Analogue Scale (VAS).⁶

This study suggests a greater rate of anterior knee pain with advancing age than adolescent patients, with greater frequency of limp, swelling, atrophy, and muscle imbalance specifically imbalance between vastalis medialis and lateralis. Symptomatic knee flexion contractures had been reported after ACL reconstruction. Based on these observations, it can be deduced anterior knee pain after ACL reconstruction is closely associated with persistent knee flexion contracture. More specifically, anterior knee symptoms seem particularly prevalent in patients who fail to regain full hyperextension equal to the contralateral knee. Different variables that have been found with respect to the prevalence of AKP include knee-specific characteristics, prosthetic design, surgical technique, adjustment of the patella baja and the instance at which assessment has been done.⁷

Studies have shown that incorrect biomechanics, muscle imbalance (impaired length-tension relationship) patella baja cause osteoarthritis of the knee as well as hip joint with deformities like kyphosis.⁵

The limitation of the study was that this study was done in a single hospital setting (Ghurki Trust Teaching Hospital, Lahore, Pakistan) and the sample size of the study was too small because the study time duration was only six months.

The recommendation was that the study can be improved by increasing the sample size and by choosing different hospital settings.

CONCLUSION

Almost 60% of the cases after 6 months of ACL reconstruction with bone-patellar bone graft complain of mild to moderate pain in the anterior section of the knee according to the anterior knee pain scale (AKPS).

AUTHORS CONTRIBUTION

MA: Drafting of article, Data Analysis

NJ: Drafting of Article, Collection and assembly of data

MWA: Critical Appraisal of article

MMA: Critical appraisal and final approval of article

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