

Does delay in Acl reconstruction increases incidence of associated injuries?

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ABSTRACT:

Background and objective: Anterior cruciate ligament (ACL) rupture is the most common among young population involved in sports activities. In previous literature it is evident that delay in reconstruction results in increased incidence of meniscal injury and degenerative changes due to knee instability. The aim of this study is to find out incidence of meniscal injury and cartilage damage in ACL deficient knee and whether the incidence is more in chronic ACL deficient knee.

Methods: All cases of ACL reconstruction done in our institution during 2011 to 2015 were included in study. Patients above 50 years were excluded. The case records reviewed and data collected. The time period between primary injury and surgery noted along with findings in diagnostic arthroscopy. The cases were divided as per the times when surgery was done after primary injury in to two groups as early reconstruction group (Group A) and late reconstruction group (Group B). The associated injuries of meniscus and cartilage damage were noted in both groups

Results: After considering inclusion and exclusion criteria 113 patient were included in study. 65 patients were in Group A and 48 patients in Group B. 36 patients (74%) in Group B and 23 patients (25%) in Group had meniscal injury. It was observed that Group B had high incidence of medial meniscal injury compared to Group A. four patients in Group B had chondral damage compared to one patient in Group A.

Conclusion: Incidence of medial meniscus injury and both meniscus injury was found to be more in late reconstruction group. Chondral damage also is more in late reconstruction group. Delay in ACL reconstruction results in early onset of degenerative changes and meniscal injury. We recommend early reconstruction of ACL preferably within three months.

Keywords: Ligament, Meniscus, Chondral defect, Hamstring graft.

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Quick Response Code:	Website:
	www.innovativepublication.com
	DOI: 10.5958/2395-1362.2015.00042.0

INTRODUCTION

Anterior cruciate ligament (ACL) rupture is the most common sports injury of the knee.¹ Not only in young also seen in elderly population. ACL is primary stabilizer of knee against anterior translation.^{1,2} Knee instability and giving way sensation is common complaint when ACL is not intact. Incidence of meniscal injury associated with ACL tear is reported to be around 55% to 65%.³⁻⁷ If reconstruction is delayed then there is increased risk of injury to other intra-articular structures like meniscus and cartilage.⁸ Many studies have shown that high incidence of meniscal injury and chondral damage is found in chronic ACL deficit knees. Also development of degenerative joint disease is found at earlier age when treatment of knee instability is delayed.⁹

Meniscus can be injured at the time of trauma along with ACL or later because in knee

instability. High incidence in meniscal injury in chronic ACL tear cases suggests that knee instability is one of causative factor. Also several studies have shown that meniscal injury is more in chronic ACL tear and medial meniscus is more common when compared to lateral meniscus.^{10,11} Although early ACL reconstruction reduces the incidence of meniscal tears, the relationship of cartilage damage and ACL reconstruction is controversial.⁸ It is still not clear whether early reconstruction of ACL prevents osteoarthritis.¹² There are a number of studies on long-term results of ACL reconstruction.^{12,13} Many of these studies concluded that late reconstruction results in meniscal damage hence early reconstruction is recommended.¹³⁻¹⁶ Hence ACL reconstruction not only stabilizes knee joint also prevents injury to meniscus and cartilage and delay the onset of arthritis.

Although it is shown by many studies that delayed ACL reconstruction results in meniscal injury and early onset of degenerative changes but it is not clear how much early reconstruction is beneficial. Our aim is to identify incidence of meniscal injury in ACL deficient knee and compare incidence in early and late group and also to determine safe period for ACL reconstruction.

PATIENTS AND METHODS

We reviewed all patients who had undergone ACL reconstruction in our institution between 2011 to 2015. The inclusion criteria were patients between 16-50 years of age, unilateral pathology, with no previous knee surgery. Exclusion criteria were age above 50 years and previous knee surgery. Patients with age above 50 years were excluded as age related degenerative changes are common after 50 years. Totally 113 patients were included in study who met inclusion criteria. There were 95 men and 18 women with a mean age of 31 years (16 to 50). The mean time from injury to surgery was 18 months. Reconstruction was carried out using middle-third patellar tendon graft in all 33 patients and using hamstring graft in 80 patients. Experienced surgeons carried out surgical procedures in all patients. Surgeon who was operating recorded intra-operative findings about meniscus and cartilage damage. Also additional details like time to surgery, graft used were noted. The incidence of meniscal injury and cartilage damage was noted and compared between group A and group B. Then statistical analysis was done to determine whether associated injury in-group A and group B is significant and also to find out whether delay in surgery results in increase incidence of associated injuries.

STATISTICAL ANALYSIS

Categorical data were analyzed using the chi-squared test. A p value of 0.05 was considered significant.

RESULTS

Incidence of meniscal tears

The incidence of associated injuries in the group A and group B is shown in Table 1. 23 patients had medial meniscal injury in-group B when compared to group A. The incidence of lateral meniscal injury was also little more in-group B compared to group A. Combined medial and lateral meniscal injuries were around three times higher in-group B compared to group A. The meniscal injury in both groups was analyzed and found to be significantly more in-group B (chi-squared test; p value- .032). Additional posterolateral, posteromedial injury was found only in-group B and ACL with PCL injury was found in three patients of group B and it was one in-group A.

Incidence of degenerative changes

The incidence of degenerative change was compared between the group A and group B. Four patients in-group B and one patient in-group A had cartilage damage.

Table 1: sex distribution

Sex	Number	Percentage
Males	95	84%
Females	18	16%
Total	113	

Table 2: Duration between injury and surgery

Duration	Number of patients	Percentage
< 3 months – Group A	65	57.5%
>3 months- Group B	48	42.5%
	113	

Table 3: ACL associated injuries comparing early and late group

	Early (65)	Late (48)
Medial menisci	10(15%)	21(43%)
Lateral menisci	13(20%)	15 (31%)
Medial and lateral menisci	2(3%)	5(10%)
Osteochondral defects	1	4
Posterolateral corner injury	-	2
Posteromedial corner injury	-	1
ACL and PCL injury	1	3

DISCUSSION

In present literature it is evident that delayed reconstruction results in injury to meniscus but it is not clear how much early reconstruction is beneficial. Acute knee injury is usually associated with other ligament tears (medial or lateral collateral ligament injury). Hence immediate ACL reconstruction is controversial as associated ligament (medial and lateral collateral ligament) injury need immobilization for at least three weeks for healing. Later quadriceps strengthening and improving knee range of movement before ACL reconstruction will take few more weeks. Considering these factors we feel three months would be appropriate for early reconstruction. Hence patients were divided in to two groups as early (reconstruction done within three months, group A) and late (reconstruction done after three months, group B) groups.

Millet PJ et al in their study concluded that chronic ACL injury is associated with more incidence of medial meniscal injury.¹⁷ Meniscal tears in chronic ACL tear were complex tears.^{18,19} Repairing would be difficult in complex meniscal tears and hence partial meniscectomy is done. In acute ACL injury cases meniscus tear is simple and repair may be possible. Hence partial meniscectomy along with instability contributes for early degenerative changes and cartilage damage in chronic.

Our findings show a increase in meniscal tears and degenerative changes in patients undergoing reconstruction of the ACL more than 3 months after injury. In our study we found incidence of medial meniscus injury in significantly high in group B when compared to group A. Our findings

indicate that ACL reconstruction carried out within three months of injury was associated with a low incidence of meniscal damage and degenerative changes.

The surgeon who performed surgery documents intra-operative findings, this avoided the observer bias in classifying pattern of meniscal injury and classification. Although incidence or cartilage damage was less in both groups but when compared to early reconstruction group (group A) it is more in delayed group (group B). Many ACL injuries were associated with other supporting ligament injuries and these injuries were of varying grade. Most of these associated ligament (medial and lateral collateral ligament) injuries can be treated conservatively by immobilization. Hence we don't recommend immediate reconstruction of ACL. Prior to ACL reconstruction improving knee range of movement to at least 90-degree flexion without extensor lag would take few more days. Hence we recommend ACL reconstruction up to three months. Delay than this period results in more meniscal injury and degenerative changes.

CONCLUSIONS

In chronic ACL tear incidence of meniscal injury and cartilage damage is more. Delay in ACL reconstruction surgery can have a deleterious effect on the meniscus and articular surface of the knee. Early reconstruction is therefore recommended to preserve the structures of the knee that are in danger of further damage if left untreated.

Conflict of Interest: None

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