

ARTHROSCOPIC EVALUATION OF INCIDENCE OF MENISCAL INJURIES IN ANTERIOR CRUCIATE LIGAMENT DEFICIENT KNEE JOINTS-A PROSPECTIVE STUDY



Orthopaedics

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ABSTRACT

Knee instability due to ACL injury is a disabling clinical problem, especially in the athletic individual. The menisci play an important role in knee homeostasis, load transmission, shock absorption, lubrication, joint stability and proprioception. Injuries in the menisci can cause pain, disability, as well as accelerate the progression of osteoarthritis of the knee. Meniscal lesions are strongly associated with ACL injuries but the exact relationship between the two is not established. The present study is put forth to determine the relation between the incidence of meniscal injuries in ACL deficient knee and the time of surgery after injury. We also analysed the site of meniscal tears, whether medial or lateral, in acute and chronic ACL deficient knees.

KEYWORDS

Anterior cruciate ligament tear, knee, arthroscopic reconstruction, meniscal injury

INTRODUCTION

Orthopaedic injuries to knee are frequent and generally keep the athlete away from the sports competitions. Rotation of knee occurs in various sports like soccer, basketball, and skiing by which injury to anterior cruciate ligament (ACL) is seen most often, that constitute greater than 250,000 cases per year¹. The literature documents, association of meniscus tears with anterior cruciate ligament injury with a prevalence rate of 55% to 65% approximately². It has been suggested that reconstruction of the ACL reduces the incidence of meniscal tears. Hence, while reconstructing the ACL, apart from stabilizing the knee joint, the aim is also to reduce secondary damage to the intra articular structures. It was recommended that a patient with a torn ACL should be diagnosed early whether there is an associated meniscal injury or not, the reason being that the patient can be properly and promptly treated to prevent early degeneration of the knee joint³. In the present study we recorded the incidence of meniscal tears in ACL deficient knee joints and related our findings to the time elapsed since injury. Aim of the study was to determine the relation between the incidence of meniscal injuries in ACL deficient knee and the time of surgery after injury. We also analysed the site of meniscal tears, whether medial or lateral, in acute and chronic ACL deficient knees.

MATERIALS AND METHODS

In this prospective study, 50 patients with mean age of 28.78 years (45 males and 5 females), who underwent ACL reconstruction arthroscopically during the period, October 2015 – July 2017 were selected from Sri Venkata Sai College and Hospital, Mahabubnagar, Telangana.

Patients with acute and chronic internal derangement of Knee were included in the study. Patients with associated bony injuries on the ipsilateral limb and below or above 18-50 years were excluded. These patients were then assessed with proper history and clinical examination. Patients who underwent procedure within 6 months of injury were grouped into acute or early group, whereas beyond 6 months were pooled in chronic or late group. Clinical examination of the knee joint was performed using standard tests for anterior cruciate ligament (Lachmann test, anterior drawer test and pivot shift test) and for menisci (joint line palpation, McMurray's test, Squat test, Steinmann sign and Apley's tests). Radiographically patient was subjected to Biplane radiographs (Antero Posterior and lateral views) to assess bony abnormalities and MRI to knee the meniscal lesions. The patient was posted for ACL reconstruction arthroscopically. All patients were examined while under anesthesia (Lachman's, Anterior drawer's and Pivot shift tests), followed by routine diagnostic arthroscopy; also any necessary meniscal surgery was performed, followed by the ACL reconstruction in the same session.

positioned supine with the unaffected limb in lithotomy and the affected limb hanging down with knee flexed at 90 degrees, parts prepared sterile and draped. Through the standard anteromedial and anterolateral portals scope introduced and diagnostic arthroscopy performed. Intra-articular structures visualised and the lesions clearly identified and recorded using specified software. Partial meniscectomy of the affected meniscus done and the remnant of the torn ACL debrided using shaver. Joint wash given. Semitendinosus (ST) graft harvested from the ipsilateral limb and prepared appropriately. Appropriate tibial and femoral tunnels created. Graft introduced by arthroscopic guidance and fixed both in the femoral and tibial sites using (bioabsorbable / titanium interference screws or endobutton and suture wheel). Joint wash given, wound closed in layers.

RESULTS

Of the 50 patients, 45 were males and 5 were females with 28 patients injuring the right knee and 22 injuring their left knee. The mean age of ACL repair was 28.78 years (range 18-50 years). There were 34 patients in the early group and 16 patients in the late group. The overall incidence of meniscal tears in ACL deficient knees was 35 out of 50 patients (70%). 20 out of 34 patients in the early group (58.8%) had meniscal injuries as compared to 15 out of 16 patients (93.75%) in the late group (figure 1). In the early group there were only 5 cases of medial meniscal tear (14.7%) compared to 13 cases of lateral meniscal tears (38.2%). In the late group there were 11 cases of medial meniscal tears (68.75%) compared to 2 cases of lateral meniscal tears (12.5%) (table 5). Patients with both meniscal tears in the early group were 2 (5.9%) and in the late group were 2 (12.5%). Patients with isolated ACL tears were 14 (41.1%) in the early group and 1 patient (6.25%) in the late group (table 1, figure 2).

DISCUSSION

ACL injuries are more often seen in patients with age range of 15 to 45 year⁴. These young and active patients need to go for operative reconstruction to restore knee biomechanics and, subsequently, prevent the early development of osteoarthritis (OA) of the injured knee⁵. There is a ten-fold increased incidence of knee osteoarthritis (OA) after ACL tear suggesting greater than 50% of patients sustain an ACL injury will develop symptomatic OA in the following 10 to 20 years. The timing of reconstruction and rehabilitation is of paramount importance for a successful outcome. The following three main factors should be taken into consideration and balanced for the timing of ACL reconstruction. The increased incidence of meniscus and chondral injuries following delayed ACL reconstruction, the risk of arthrofibrosis associated with early ACL reconstruction, and the associated loss of muscle strength due to inactivity when surgery is delayed⁶.

It is a descriptive study to evaluate the incidence of meniscal injuries, its site (medial or lateral) in ACL deficient knee joints in acute and

Patient after spinal or epidural anaesthesia, under tourniquet control

chronic ACL deficient knees. In the present study the age range was 18-48 years with mean of 28.78 years which is similar to a study conducted by Ravi Gupta et al 2016 with age range of 17-51 years 26.43 years⁷. Matthias J Feucht et al with mean age was 27.8 ± 10 years². The overall incidence of meniscal tears in ACL deficient knees was 70% which was similar to studies reported in literature Ankit Syal et al 2014 with incidence of 78.8%⁸. Hagino et al 2015 stated the incidence of meniscal tear diagnosed by arthroscopic examination was 79.2% (437 of 552 knees) in all subjects⁹.

In the present study patients with early group had a total incidence of 58.8% association of meniscal tears with ACL injuries where as the late group had an incidence of 93.75%. This was similar with several studies were reported in the literature like Ankit Syal et al 2014 the incidence of meniscus tears in acute ACL tears was 41% to 77%, indicating that meniscal tears are more commonly associated with chronic ACL tears⁸. Hagino et al 2015 reported incidence of 72.7 % (186 of 256 knees) in acute group and 84.8 % (251 of 296 knees) in chronic group, and was significantly higher in chronic group⁹. In line with the results published by Papastergiou *et al.*, our finding showed the association between ACL tear and meniscus injury 3 months after the events. It could be concluded that the rate of secondary meniscus injury increases over time and, therefore, the operation should be performed within 3 months of the injury¹⁰.

In the present study, the incidence of lateral meniscal tears did show a significant difference in both groups. The incidence was 38.2% in the early group and 12.5% in the late group. However the incidence of medial meniscal tears showed a significant increase as the time since injury progressed. It was 14.7% in the early group as compared to 68.75% in the late group. Similar findings were also reported according to Hagino et al 2015 the laterality of meniscal tears, in acute group (186 knees), medial meniscal tear was found only in (20 knees) 10.8 %, lateral meniscal tear only in (129 knees) 69.4 %, and bilateral meniscal tears in (37 knees) 19.9 %. In chronic group (251 knees), medial meniscal tear was found only in (62 knees) 24.7 %, lateral meniscal tear only in (85 knees) 33.9 %, and bilateral meniscal tears in (104 knees) 41.4 %. Acute ACL injuries were commonly associated with lateral meniscal tear, whereas with chronic ACL injuries medial meniscal tears were commonly reported⁹.

In the present study the incidence of both meniscal injury in the same patient was 5.9% in the early group and 12.5% in the late group. The percentage of patients with no meniscal injuries was 41.1% in the early group and 6.25% in the late group.

The present study concludes that incidence of meniscal tears is increased in ACL deficient knee joints. Medial meniscal tears are more common than lateral meniscal tears in late group of ACL deficient knees. A delay in ACL reconstruction increases the risk of meniscal tear due to alteration in biomechanics of the knee joint. Early ACL reconstruction restores the normal biomechanics of the knee joint and thereby prevents further derangement of the ligamentous structures of the knee avoiding development of secondary osteoarthritis.

Table 1: Comparison of the incidence and side of meniscal tears in early and late group

	EARLY GROUP	LATE GROUP	TOTAL
PATIENTS	34	16	50
MENISCAL INJURY	20 (58.8%)	15 (93.75%)	35 (70%)
MEDIAL MENISCUS	5 (14.7%)	11 (68.75%)	16 (32%)
LATERAL MENISCUS	13 (38.2%)	2 (12.5%)	15 (30%)
BOTH MENISCUS	2 (5.9%)	2 (12.5%)	4 (8%)
NO MENISCUS	14 (41.1%)	1 (6.25%)	15 (30%)

BELOW 6 MONTHS = EARLY GROUP
6 MONTHS AND ABOVE = LATE GROUP

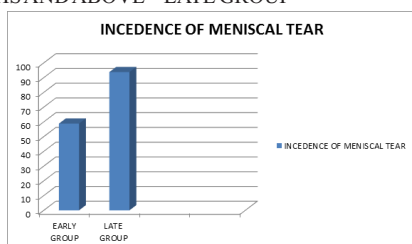


Figure 1: Comparison of incidence of meniscal injuries in early and late group

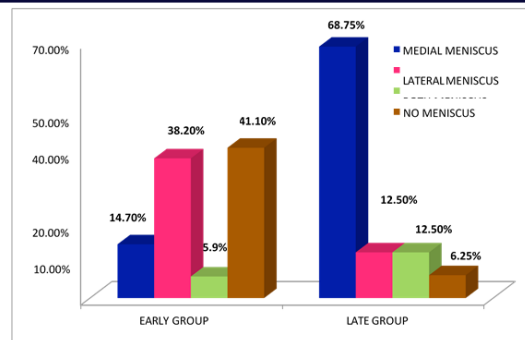


Figure 2: Comparison of the incidence and side of meniscal tears in early and late group

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