Study of Role of Arthroscopy in the Management of Acute Knee Injury

Rajesh Kishanrao Ambulgekar[1], Kundan Sen[2]

ABSTRACT

Introeduction: Injury to the anterior cruciate ligament (ACL) is the most common ligamentous injury, ranging up to 200,000 injuries per year and associated with medial collateral ligament injury. Arthroscopy is carried out as soon as possible after admission to diagnose ligamentous injury and immediate repair or reconstruction procedure could be carried out if necessary. Arthroscopy allows us maintaining the mechanical axis and restoring ligamentous stability. Study aimed to assess the therapeutic value of Arthroscopy in Acute Knee Injuries and to evaluate the complications of Arthroscopy in case of Acute Knee Injury.

Material and Methods: This study was a prospective study done on 30 consenting patients with acute knee injury with-in 24 hours to 6 days of the initial trauma, closed trauma, mono-trauma cases, adult patients with age >10 years and cases in which MRI is contraindicated. A detailed physical examination was done generally under anesthesia and arthroscopy was performing. All ligament reconstructions were performed by arthroscopically assisted surgery. Subjective evaluation is done by using KOOS score for subjective evaluation from (N=30).

Results: In the present study, most of the cases, 19 (63.33%) were from the middle age group (21 to 40 years). Most of the patients, 21 (70%) were males. 19 cases (63.33%) presented with joint pain and swelling. Meniscal surgery was needed in 23 cases (76.67%), and PCL surgery was done in 2 cases (6.67%). Full range of motion was got back in 19 cases (63.3%) and there was terminal restricted range of motion in 11 cases (36.7%).

Conclusion: Arthroscopy is much useful even in the acute knee injury cases as it provides direct vision in the joint, we can diagnose cruciate ligament injury, meniscus injury, tibial spine avulsion injury, and also manage these injuries simultaneously without need of 2nd operation and without need of MRI

Keywords: Acute Knee Injury, Arthroscopy, Anterior Cruciate Ligament, Posterior Cruciate Ligament Injury, Medial Meniscus Injury.

INTRODUCTION

The knee joint is one of the major weight-bearing joints in the lower extremity. Knee joint is made up of many different structures – ligaments, bones, joint cartilage and two menisci.An acute injury of the knee joint is the result of a single incident – such as a twist, fall, excessive force or direct blow from a solid object.

Injury to the anterior cruciate ligament (ACL) is the most common ligamentous injury, ranging up to 200,000 injuries per year.[1] Combined injury of the anterior cruciate ligament, medial meniscus and the medial collateral ligament is the commonest finding.In these patients,arthroscopy is carried out as soon as possible after admission to diagnose ligamentous injuryand immediate repair or reconstruction procedure could be carried out if necessary.

Even though reconstruction is the most common treatment for ligament rupture, there remains debate in the literature regarding the optimal timing of surgery.[2] Smith et al[3] concluded from their systematic review that there were no differences in clinical outcomes between early (less than 3 weeks) and delayed (greater than 6 weeks) ligamentous repair or reconstruction; however, there is unnecessary duration of loss of knee function.[2] Arthroscopy also allows us maintaining the mechanical axis and restoring ligamentous stability and to achieve functional painless and good range of motion in the knee joint.[4,5]

The aim of this study is to evaluate the role of arthroscopy in early diagnosis of cruciate ligament injury,meniscus injury,tibial spine bony avulsion injury and to restore function as early as possible by arthroscopic reconstruction or repair.

Study aimed to assess the therapeutic value of Arthroscopy in Acute Knee Injuries and to evaluate the complications of Arthroscopy in case of Acute Knee Injury.

MATERIAL AND METHODS

This study was a prospective study done on 30 consenting patients with acute knee injury with-in 24 hours to 6 days of the initial trauma, closed trauma, mono-trauma cases, adult patients with age >10 years and cases in which MRI is contraindicated. Patients with openfracture, age < 10 years of age and > 70 years ofage, having distal neurovasculardeficit, with signs ofinfection and patient who refused diagnosticarthroscopy, were excluded.

[1]Professor and Head, Department of Orthopedics, Dr. S.C. Govt. Medical College, Vishnupuri, Nanded, Maharashtra, [2]Junior Resident, Department of Orthopedics, Dr. S.C. Govt. Medical College, Vishnupuri, Nanded, Maharashtra, India

Corresponding author: Dr. Kundan Sen, Junior Resident, Department of Orthopedics, Dr. S.C. Govt. Medical College, Vishnupuri, Nanded, Maharashtra, India

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Arthroscopic Examination of the Knee

Adetailed physical examination was done generally under anesthesia like Lachman test, anterior drawer test, classic pivot shift test, knee aspiration. After performing a thorough arthroscopy of the knee, the pathological structure was identified and further surgery was carried out accordingly (partial/subtotal meniscectomy for meniscal tears, ACL reconstructions for ACL tears). All ligament reconstructions were performed by arthroscopically assisted surgery, reconstruction was done using STG graft or PTB graft. The follow up period was 1st, 2nd, 3rd, 6th month. Radiological evaluation: Check X-ray knee joint with proximal 2/3rd leg Antero-posterior & lateralview

Assessment

Patients who underwent ligament reconstruction or diagnostic arthroscopy were evaluated by both subjectively as well as objectively in a retrospective manner. Subjective evaluation is done by using KOOS score[6] for subjective evaluation from (N=30). Symptoms of instability, activity level and overall knee functions in particular were scrutinized. Objective evaluation consisting of Lachman, pivot shift, assessment of ROM, graft site morbidity and patella-femoral evaluation wasdone.

STATISTICAL ANALYSIS

Data was analyzed using statistical methods and diagrammaticpresentation, percentages, mean +/- SD were calculated as per the need.

RESULTS

In the present study, most of the cases, 19 (63.33%) were from the middle age group (21 to 40 Tears) The mean age was 32.36+11.54 years. Most of the patients, 21 (70%) were malesand 9 cases (30%) were female.

Clinical Presentation

In the present study we had 03 cases (10%) with joint instability, 19 cases (63.33%) with joint painandswelling, and 08 cases (26.66%) with pain, swelling and locking of knee joint. 40% cases were having injury on the left side and 60% cases on the right-side. 26 (86.66%) patients were having hemarthrosis and 04(13.33%) patients presented with effusion.

Various Ligament Injuries

In the present study 21 (70%) cases were having anterior cruciate ligament (ACL) injury. 2 cases (6.67%) had posterior cruciate ligament (PCL) injury, 22 cases (73.33%) had medialmeniscus injury, 6cases (20%)hadlateralmeniscus injury, 2 cases (6.67%) with medial collateral ligament injury and 2 cases (6.67%) were having lateral collateral ligament injury.

Surgical Procedures

The above table shows the procedure done. Meniscal surgery, additional meniscal surgery was needed in 23 cases (76.67%), and PCL surgery was done in 2cases (6.67%). (Table 1)

Post-operative Duration of Hospital Stay

All patients were discharges within a week of surgery. 50% patients on day 2, 46.7% on day 3 and one patients discharged on next post-operative day. (Graph 1)

Range of Motion

When we evaluated the post-operative range of motion, we found that Full range of motion was got back in 19 cases (63.3%) and there was terminal restricted range of motion in 11cases (36.7%). (Table 2)

Post-Operative Pain

In the present study when we evaluated the pain status on follow up post-operative only 9 cases 30 percent hadpain.

Average KOOS score

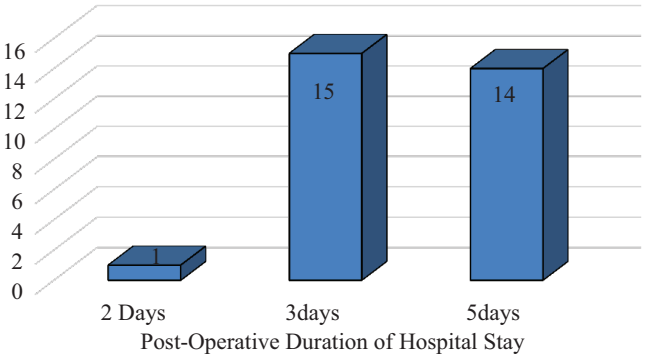
It was used for subjective evaluation of all our patients at each follow-up. In our study 30 patient underwent arthroscopy and were evaluated with KOOS score at final follow up was

Surgical Procedures	Number	%
Meniscectomy	13	43.33%
ACL reconstruction	3	10.00%
ACL reconstruction with meniscectomy	6	20.00%
ACL reconstruction with meniscus repair with proline	1	3.33%
Arthroscopic lavage	2	6.67%
PCL reconstruction with meniscectomy	1	3.33%
PCL reconstruction	1	3.33%
Arthroscopic screw fixation	1	3.33%
CC screw and meniscectomy	1	3.33%
Meniscectomy with tibial plateau screw fixation	1	3.33%
Total	30	100.00%

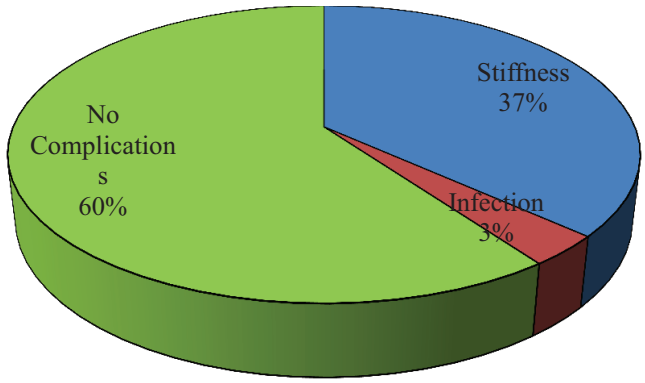
Table-1: Surgical Procedures:

Range of Motion	Frequency	Percent
Full	19	63.3
Terminal Restricted	11	36.7
Total	30	100.0

Table-2: Range of Motion:



Graph-1: Post operative duration of hospital stay



Graph-2: Complications

found close to 100 transformed score. It was suggestive of good to fair outcome.

Complications

In the present study when we evaluated the complications on post-operative follow up. 1 patient developed infection managed with screw removal,debridement, antibiotics. 11 patients developed stiffness in the form of terminal restriction of movement, managed with physiotherapy. (Graph 2)

DISCUSSION

Medial and lateral collateral ligament injury usually occurs in people who play contact sports, such as football.[7] Collateral ligament tear usually diagnosed by clinical test like Varus and valgus stress test and treated with reconstruction by open method[8] Anterior and posterior cruciate ligamentinjuries are more common in athletes, particularly in skiing, football players.[9] Reconstruction is being done by arthroscopy using bone patella bone tendon graft, semitendinosus graft, gracillis graft and peroneus longus graft.

In the present study, Meniscal surgery, additional meniscal surgery was needed in 23 cases (76.67%), and PCL surgery was done in 2 cases (6.67%).50% patients discharged on day 2, 46.7% on day 3. It was found that full range of motion was got back in 19 cases (63.3%) and there was terminal restricted range of motion in 11cases (36.7%).On follow up post-operative, only 9 cases (30%) hadpain.

J. Gillquistet al[10] performed arthroscopy during the acute phase of injury in 84 knees (79 patients). A satisfactory view of the joint was obtained in all cases, and no complications occurred. About two-thirds of the patients had injuries associated with violent rotation-abduction. In about one-third of the patients' operation could be avoided. In cases with hemarthrosis, serious ligament injury was present in nearly 50 per cent. Complete arthroscopy was associated with few diagnostic errors. Clinical examination often led to uncertain or incorrect diagnosis even whenperformedunderanaesthesiabyexperiencedsurgeons. Incontrast, arthroscopy led to rapid diagnosis and treatment, thus shortening the period of disability. We recommend arthroscopy in acute knee injuries, but the examination must be performed by an experiencedarthros| copist.

In our study we also face some complications but were managed well. 1 anterior cruciate ligament reconstruction patient got infected, debridement done, and antibiotics given as per culture sensitivity report, wound got healed and rehabilitation done with physiotherapy. On subsequent follow-up patient came with full range of motion and withoutpain.Patient who develop terminal restriction at extension were managed with physiotherapy with quadriceps and hamstrings exercises. Similarly,Jomha et al[11] reported six patients with graft failure, screw removal in seven patients. Manipulation under anesthesia in three patients, Arthroscopic division of adhesions in two patients. One patient with deep infection was treated with lavage and screw removal. Railey William et al. 2004 reported six patients with traumatic rupture of graft, five of which were revised arthroscopically and one was treated with knee stabilization brace. Two patients with deep infection were treated with arthroscopic irrigation and debridement, intravenous and oral antibiotics and rehabilitation. D Choudhary et al. 2005 had not reported any graft failure or deep infection. They reported most common complication as anterior knee pain and most common immediate complication as screwdivergence.

CONCLUSION

In acute knee injury cases with heamarthrosis it is possible to get good vision after drainage of heamarthrosis.A fair number of acute knee injury cases diagnosed early with ligamentous injury and treated simultaneously witharthroscopy.All patients returned to their routine activity early due to early diagnosis and arthroscopicrepair.

Following arthroscopically assisted cruciate ligament reconstruction,meniscus repairand meniscectomy in acute knee injury cases, it is possible to get a good range of motion post operatively.The advantages of arthroscopically assisted repair of meniscus or cruciate ligament reconstruction in acute cases, include elimination of capsular incisions, decrease in trauma to the fat pad, avoidance of desiccation of the articular cartilage, better visualization of the femoral attachment and a lower incidence of postoperative patello-femoral pain than with open repair. Also patient got mobilize early.

Complications associated with arthroscopy in acute knee injury cases do occur like infection, stiffness, graft failure, but these complications managed well.

So the arthroscopy is much useful even in the acute knee injury cases as it provide direct vision in the joint, we can

diagnose cruciate ligament injury, meniscus injury, tibial spine avulsion injury, and also manage these injuries simultaneously without need of 2nd operation and without need of MRI

Limitations of this study

- The small sample size and no long term follow up was done of the patients are the major drawbacks of thestudy
- The long-term follow-up was notevaluated.

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