



Evaluation of Arthroscopic Findings & Operative Treatment of Meniscal Injuries

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ABSTRACT

Background : Medial meniscal injury is also associated with other ligamentous injury. Unnecessary MRI scanning increases the financial burden and delays patient treatment. Arthroscopy has played an important role in diagnosis of meniscal tear which cannot be assessed either clinically or radiologically. Objective : To evaluate the suspected cases of knee injuries and to rule out meniscal tears. & to perform diagnostic and therapeutic arthroscopy of knee joints after documenting the meniscal tears and on MRI and correlating these findings. Methods: This is a prospective nonrandomized study conducted on 42 traumatic meniscal injuries . Out of 42 cases, only 30 patients in the age group above 18 years old were enrolled for the study those who had fulfilled the inclusion and exclusion criteria were included in the study. Those who enrolled as said in inclusion criteria were all patients with history of injury of knee who underwent both MRI and arthroscopy Arthroscopy was carried out under spinal anaesthesia under pneumatic tourniquet control under all aseptic precaution. Scrubbing, painting and draping were done. Data collected from 30 subjects & statistical analysis was done. Results : It was found that 8 cases have Bucket Handle tear, 7 cases have Parrot Beak and Radial tear respectively. 4 cases have Frayed Edge and Circumferential tear respectively. & among 30 cases in study group. Meniscal balancing is done in 12 cases, Meniscal repair is done in 11 cases and 7 cases have meniscectomy. Conclusion: arthroscopy thus is useful in diagnosing the lesion, type and planning for its treatment in same sitting & it could serves as a diagnostic as well as therapeutic tool.

KEYWORDS :

Introduction

The knee is most frequently injured joint and usually susceptible to traumatic injury because it is more superficial. Meniscal tears are the most common knee injuries, comprising 75% or more of all internal derangements of the knee^[1-2] with the incidence^[3] of acute meniscal tears close to 60 in 100,000.

In lesions of the knee joint, meniscus are the most frequent orthopaedic affections. Due to the recent increase in sporting activities, there has been a great rise in incidence of meniscal injuries. Menisci are important structures in the normal knee joint and there is an increasing understanding of their functional significance.

The knee was the first joint to be examined with arthroscopy, and many of the fundamental principles of arthroscopy of all joints were originally developed for the knee. Although knee arthroscopy had its roots in Japan and Europe, it became popular in the United States in the 1960s, and substantial progress has been made over the past five decades^[4].

Medial meniscus is more commonly injured than the Lateral meniscus because it is smaller in diameter, thicker in periphery, wide, more mobile, attached to both cruciate ligaments, and stabilised posteriorly to the femoral condyle by popliteus. Medial meniscal injury is also associated with other ligamentous injury.

Clinical examination and Magnetic resonance imaging (MRI) are tools commonly used in the diagnosis of meniscus tears. Lee et al^[5] found that MRI is widely accepted as an accurate, non-in-

vasive method in the evaluation of meniscal disorders^[6-10]. However, further publications by Rose et al.^[11] and others^[12-13] highlight the value of an adequate history and clinical examination. With studies proving that history, symptoms and clinical examination alone are effective in the diagnosis of these injuries; scanning is not always beneficial. Unnecessary MRI scanning increases the financial burden and delays patient treatment. However clinical examination is not always accurate because some menisci lesions do not produce characteristic symptoms and signs. For example a clinical sign depends on the displacement of a meniscal fragment may be negative either because the tear is too small to allow displacement in the clinical test or too large, so that the fragment is permanently displaced, which can be picked up on MRI. However, MRI scanning also gives false diagnosis.

Arthroscopic procedures are carried out for the diagnosis and treatment of knee problems for many years. Arthroscopy has played an important role in diagnosis of meniscal tear which cannot be assessed either clinically or radiologically.

Arthroscopy thus is useful in diagnosing the lesion, type and planning for its treatment in same sitting. Thus it serves as a diagnostic as well as therapeutic tool. So aim of the study is to evaluate the suspected cases of knee injuries and to rule out meniscal tears. & to perform diagnostic and therapeutic arthroscopy of knee joints after documenting the meniscal tears and on MRI and correlating these findings.

Materials & Methods

A prospective nonrandomized study on –"Arthroscopic evalu-

ation and treatment of meniscal injuries” was planned to conduct in the period from July 2013 to September 2015 as a part of thesis of Master of Surgery in Orthopaedics Residency at Padmashree Dr. D. Y. Patil Medical College & Hospital, Research Centre, Pune.

The final synopsis and the study protocol were approved to be conducted in its presented form by the Institutional Ethics Committee before the commencement of the study in July 2013.

Forty Two cases of traumatic meniscal injuries were identified and prospectively reviewed clinically, with MRI scan followed by arthroscopic surgery. Out of 42 cases, only 30 patients in the age group above 18 years old were enrolled for the study those who had fulfilled the inclusion and exclusion criteria were included in the study. Written and valid consents were taken from the patients after providing adequate information and answering their question and queries in detail depth. Patients who were willing to voluntarily participate were only enrolled in the study.

Age of patient 16 years and older. Patient giving consent for inclusion in the study. Patient with knee symptoms clinically diagnosed as meniscus tear were included in the study. Patient with prior surgery for meniscus tears or knee pathology. Non ambulatory patients in critical illness or stage. Patients with degenerative changes or evidence of loose bodies or fractures in plain radiographs. Patients treated non-operatively for meniscus tear who were not willing for surgery were excluded from the study.

Clinical criteria used were history, tender joint line and positive McMurray’s test for meniscal injury. Additionally Pain on hyper flexion, Pain on hyper extension, Steinmann 1 sign, Steinmann 2 sign, Childress test, Apley’s grinding test, Lachman test and Anterior drawer test were considered to be essential for clinical diagnosis of anterior cruciate ligament injury if associated with meniscus tear.

Those who enrolled as said in inclusion criteria were all patients with history of injury of knee who underwent both MRI and arthroscopy. The MRI scan was requested by the examining consultant, after clinical evaluation, and the request forms contained the relevant findings on history and examination. The MRI scanner used was Phillips 0.2 Testa unit and T1 and T2 weighted images were obtained.

MRI was done

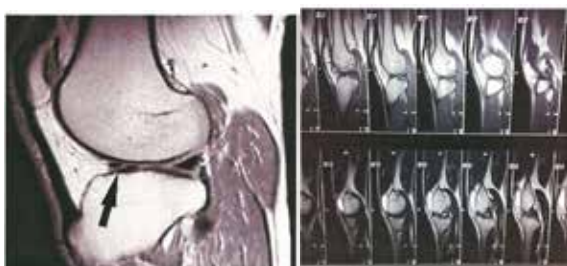


Fig: 26 &27: MRI Left knee

Sagittal magnetic resonance image (MRI) showing a tear in the anterior horn of the medial meniscus (arrow).

If required aspiration of the knee joint for any haemarthrosis under local anaesthesia was done and Robert Jones compressive bandage was given.

Arthroscopic examinations were carried out as a routine procedure under spinal anaesthesia. Examination under anaesthesia was carried out once again to check for any signs of instability. Arthroscopies were performed by a consultant knee surgeon and intra operative photographs were obtained to document the diagnosis. Record of clinical, MRI and arthroscopic findings were kept and compared. Arthroscopic findings were regarded as the gold standard.

All routine investigations were done prior to anaesthesia. Arthroscopy was carried out under spinal anaesthesia under pneumatic tourniquet control under all aseptic precaution. Scrubbing, painting and draping were done.



Fig No.28: Painting, draping & marking, with instrument trolley

Two small holes or portals are made in the knee. The arthroscope is inserted into one of the portals. A saline solution is made to flow through the scope to improve visibility and manoeuvrability of the instruments. The second portal is for the working tools. The arthroscope and the tools are typically 4.5 mm in diameter. The entire inside of the knee is inspected, including the kneecap, the ends of the thigh and leg bones that form the knee, the menisci, and the cruciate ligaments.

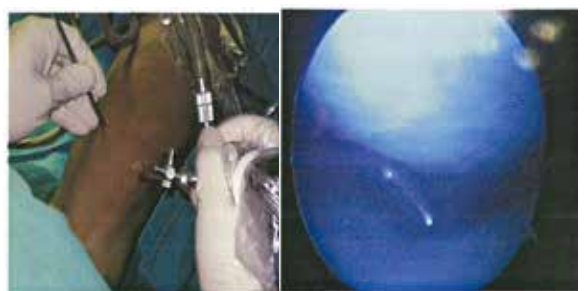


Fig No.29. Arthroscopy Procedure & Intra Operative Arthroscopic Picture

The meniscus tear is identified and probed with a small hook to determine where it starts and ends and how mobile it is. The torn fragment is then cut free and removed. The edge of the remaining meniscus is then shaved smooth. Any gliding cartilage is also shaved. Lastly, more saline is flushed through the knee to wash out any tiny particles that may be floating around. If the tear is in the vascular zone than it should be repaired. The portals are then closed with one stitch each and a long-acting pain reliever is injected into the joint.

Data collected from 30 subjects, master chart prepared after completion of these case record forms. Statistical analysis calculated on the basis of the master chart.

RESULTS

Table 1: Arthroscopic finding wise distribution of cases in study group

Arthroscopic finding	No of cases	Percentage
Bucket Handle Tear	8	26.67
Parrot Beak Tear	7	23.33
Radial Tear	7	23.33
Fraued Edge Tear	4	13.33
Circumferential Tear	4	13.33
Total	30	100

The above table shows the arthroscopic finding wise distribution among 30 cases in study group. 8 cases have Bucket Handle tear, 7 cases have Parrot Beak and Radial tear respectively. 4 cases have Frayed Edge and Circumferential tear respectively.

Table 2: Operative treatment wise distribution of cases in study group

Operative treatment	No of cases	Percentage
Meniscal Balancing	12	40
Meniscal Repair	11	36.67
Meniscectomy	7	23.33
Total	30	100

The above table shows the operative treatment wise distribution among 30 cases in study group. Meniscal balancing is done in 12 cases, Meniscal repair is done in 11 cases and 7 cases have meniscectomy.

Discussion

The present study was carried out to evaluate the suspected cases of knee injuries with clinical and radiological finding and to rule out meniscal tears. Diagnostic and therapeutic arthroscopy of knee joints was performed and patients were followed up post operatively for 6 months. Evaluation of knee scores pre and post operative by biostatistical methods.

Age wise distribution showed majority number of cases was in age group ≤20 yrs followed by 21 to 30 yrs. In age group 41 to 50 6 cases were there and 5 cases were in age group 31 to 40 yrs. Maximum number of cases were males as compared to females. Jelaviaz-Kojjaz F. et al. (2002)¹⁴ defined the sensitivity and

specificity of evaluation of meniscal lesions and cruciate ligament tears. A total of 40 patients were examined, 32 men and 8 women, aged 17-46, mean age 27±5 years. That resembles that knee injury is more common among males as compared to females.

Occupation wise distribution showed students (40%) were maximum among the cases, followed by farmers, (26%) player (17%), company worker (13%) and house wife (3%). Right knee was commonly involved among the cases as compared to left knee. Mode of knee injury wise distribution showed road traffic accident (17%) was comparatively less. Majority of cases had twisting injury (83%). Duration of pain due to knee injury was more than 4 months in 50% of the cases and remaining 50% had pain for ≤4 months.

Arthroscopic finding among the cases with knee injury showed that Bucket Handle Tear (27%) was common among the cases followed by Parrot Beak Tear and Radial Tear (23%) respectively, 4 cases with Frayed Edge Tear and Circumferential Tear (13%) respectively. (Table no 7) Ververidis AN, Verettas DA, Kazakos KJ, Tilkeridis CE, Chatzipapas CN. (2006)¹⁵ evaluated the arthroscopic findings of meniscal bucket handle tears and to correlate them with the proposed MR imaging signs. MRIs were retrospectively analyzed and showed Locked types I and II fragment of medial meniscus and half-length, whole-width and whole length-half-width fragment of lateral meniscus and most common signs in MR images of meniscal bucket handle tears were the fragment in the notch sign and the absent bow tie sign.

Among the Operative treatment for knee injury meniscal balancing was done in 12 cases followed by meniscal repair in 11 cases and Meniscectomy in 7 cases. (Table no 8) Thomas Stein et al (2010)¹⁶ studied long-Term Outcome After Arthroscopic Meniscal Repair Versus Arthroscopic Partial Meniscectomy for Traumatic Meniscal Tears. Among total eighty-one patients with an arthroscopy meniscal repair was done in 42 cases and meniscectomy was done in 39 cases. All cases were examined clinically by Lysholm score, Tegner score.

Thus arthroscopy thus is useful in diagnosing the lesion, type and planning for its treatment in same sitting & it could serves as a diagnostic as well as therapeutic tool.

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