ORIGINAL ARTICLE

Comparison of Clinical and Arthroscopic Findings in Meniscal Tears

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Abstract

Objectives: To compare Clinical findings of Meniscal Tears with Arthroscopic findings and to prove efficacy of arthroscopy.

Design: Prospective study

Place and Duration of Study: The study is perform at Department of Orthopaedics, Hamdard University Hospital, Department of Orthopaedics, Civil Hospital Karachi, National Medical Center, Ankelseria and OMI Hospitals from July 2001 to 2004.

Patients and Methods: The study comprised of 74 patients. We examined a group of patients with a suspected tear of menisci and focused on the clinical history and findings which are most often related to the injuries of menisci. Only the clinically stable knees were selected and any suspected anterior cruciate ligament (ACL) or posterior cruciate ligament (PCL) tear ware not included in our study.

All the patients were selected from the outpatient department after careful clinical examination and basic investigations. The relevant data of all the patients was recorded after including them in the study. A proper clinical evaluation was made before arthroscopy.

A 30 degree arthroscope was used in all the cases and the arthroscopy was performed under general anesthesia, or spinal anesthesia with tourniquet.

Results: The results of our study was that the accuracy rate of clinical diagnosis (77%) in comparison to that of arthroscopic diagnosis, signifies the diagnostic role of arthroscopy in meniscal tears.

Conclusion: It is concluded that arthroscopy has provided orthopaedic surgeons with highly successful tool in diagnosing and treating meniscal tears.

Keywords: Meniscal Tears, Arthroscopy, anterior cruciate injury

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Introduction

Injury to the knee joint structures remains a diagnostic and therapeutic challenge. Arthroscopy has been shown to be an effective tool for diagnosis and treatment of knee pathology. Arthroscopy is a safe and valuable procedure in the diagnosis of knee disorders[1]. Knee arthroscopy in children and adolescent patients is safe, gives a high diagnostic accuracy, and allows treatment of a variety of intra-articular conditions[2]. By means of acute arthroscopy the lesion of the intra articular structures or that of their combinations can be exactly diagnosed and treated. Depending on the findings of arthroscopy the injuries can be treated immediately or operated on at a later time, thus preventing the joint from further deterioration[3]. A systematic approach is taken to establish anatomical and path anatomical correlations, as well as the role of arthroscopy in the diagnosis and management of meniscal injuries.

The history of meniscal injury and its treatment have followed a long sepriginious path guided by trials of numerous investigators Prof. Takagi first performed arthroscopy in 1918 with a

cystoscope on cadavers[4]. He formed a school of arthroscopy in 1918 in Tokyo that is currently run by Watnabe. Cystoscope was gradually transformed into an arthroscope.

Half a century ago, Burman described the technique for arthroscopy of the knee, ankle and elbow, with the results in 30 knees[5]. The lack of adequate optical instruments prevented further expansion of arthroscopy. In 1959, Watnabe presented his Watnabe arthroscope number 21 and arthroscopic meniscal surgery was pioneered in 1960 by Watnabe and Ikeuchi[6]. This became the standard instrument around the world for almost two decades and in 1962, after great effort and research, he succeeded in performing the first arthroscopic meniscectomy. In the decade of 60's, this instrument was widely used for arthroscopy till advanced arthroscopes were introduced. The advantage in this arthroscope was that it brought a direct light source into the joint. Arthoscopic meniscal surgery was refined by O'Connor in 1974[7].

In the 1970s DeHaven and others began to perform open maniscal repair through a posterior athrotomy. Ikeuchi performed the first arthroscopic meniscal repair in Tokyo in 1979 and in 1980; Henning performed the first arthroscopic repair in the United States.

Haus J,et al, carried out a study on 60 patients with acute injuries of knee joint and they concluded that on comparison with arthroscopic diagnosis, clinical diagnosis was erroneous in about 45%. The most common mistaken clinical diagnosis was "medial meniscus tear"[8]. In a similar study, Ure BM, Tiling T, et al reported the lowest accuracy of clinical diagnosis for meniscal lesions; only 36% of meniscal tears were suspected preoperatively[9].

Lorentsen AG, et al, performed diagnostic arthroscopies in 397 patients and surgical arthroscopies in 188 knee joints with transarthroscopic surgery in local anesthesia using high dose lidocaine and no sedation. They concluded that it is possible to carry out diagnostic arthroscopy and arthroscopic surgery in most patients, especially concerning resections of menisci, using local anesthesia[10].

Johnson, in 1981, carried out a study on 229 clinically diagnosed cases of torn medial meniscus. After arthroscopic examination, only 21% isolated medial meniscal injuries were found. 23% cases were found with some additional injuries along with medial meniscal injury and in 56% cases the diagnosis was totally different[11]. An unsuspected lateral meniscal tear was found in 5% cases. With the advancement of technique and experience, later studies showed much better results with the clinical diagnosis of meniscal injuries, some of them reaching upto 80% success rate. Keeping in mind all the above considerations, this study was designed to compare clinical findings with arthroscopic findings of meniscal tear and their management by arthroscopy in the knee joint.

Patients and Methods

The patients included in the study were from 15 to 58 years of age. Out of total 74 patients, 13 were females and 61 males, between the ages of 15 and 58 years . 40 patients had symptoms in their right knee, 31 patients had problems in their left knee and 3 patients were with symptoms in both the knee joints with a total of 74 knees. The duration of symptoms lasted from a few weeks to a few months. The longest duration was 2 years. In most cases, arthroscopic examination was performed within two weeks of their first visit to us.

During hospitalization, pre and postoperative monitoring of temperature, blood pressure, white cell count, state of physical activity and presence of other complications like oedema, pain, thrombosis and infection was done.

After release from the hospital, all the patients were asked to visit OPD initially on weekly basis for 1month and then after one month for total of six months.

During each visit, patients were examined to note any complication or limitation of movements and other relevant data necessary for the

study.

Clinical diagnosis was based on careful history, physical examination and standard roentgenograms. Clinical diagnosis of internal derangements of the knee was unreliable, as the symptoms and signs of lesions to different structures were frequently similar. Movements limited by pain, muscle guarding and tense knee swelling made it difficult to evaluate stability. Standard roentgenograms are typically non-diagnostic.

Joint Line Tenderness with evidence of quadriceps wasting are most consistent and reliable signs of torn meniscus.

In recent injuries tell-tale oedema in joint line was present soon after injury.

McMurray's manoeouvre for medial meniscus, in which a click arising in the medial joint line accompanied by complaint of pain is indicative of medial meniscus tear.

McMurray's manoeouvre for lateral meniscus is the one in which a grating sensation may be felt in degenerative lesion of meniscus.

Apley's grinding test-1 & 2 were performed in patients with suspected meniscal tear and the suspect meniscus is subjected to compression and shearing stresses; sharp pain is suggestive of tear.

Meniscal cysts lie in joint line, felt firm on palpation, tender on deep pressure. Cysts of menisci may be associated with tears. Lateral meniscus cysts are by far the commonest. Cysts swelling on medial side are some times due to ganglions arising from pes anserinus.

O' Connor classification of Meniscal injuries[12] was taken for the study:

Longitudinal tear is called longitudinal because it is parallel to the edge of meniscus. Complete tears can displace and if it is displaced over the intercondylar notch it is called bucket handle tear. If the tear is near the capsular attachment of meniscus, it is referred to be a peripheral tear and suitable for suturing.

Horizontal tears are commonly found in the posterior half of the medial meniscus or mid of lateral meniscus. It is common in older people. Oblique tears run obliquely from the inner edge of the meniscus to the body of the meniscus. They are full thickness tears which may be anterior or posterior. Radial tears are similar to the oblique tear except that it runs from inner edge to the outer edge of the meniscus.

Other variations are flap tears, complex tears and degenerative tears.

The protocol of the treatment was based on exact diagnosis of the meniscal tear and its immediate treatment leading to its cure and early recovery of the patient.

For the selection of patients from OPD, strict rules were followed and each patient was thoroughly examined and investigated before being selected for the study.

After being selected for the arthroscopy, the patient was admitted in the ward for further investigations and pre-operative preparations. The clinical diagnosis was termed "correct" when it was confirmed by arthroscopy. The clinical diagnosis was "incorrect" when arthroscopy showed a different diagnosis or an additional and unsuspected major pathological lesion was found. Any additional findings observed during arthroscopic examination that were unrelated to the treatment of the problem in question and not revealed during clinical diagnosis did not necessarily make the clinical diagnosis "incorrect".

Examination under anesthesia was carried out before proceeding to the arthroscopic examination to further evaluate the integrity of intra articular structures of the knee. Arthroscopy was performed by standard techniques under general anesthesia, spinal anesthesia in an aseptic operating room using a tourniquet in all patients. Knee area was shaved where it was required. Patients were positioned supine with their knee extended. This position is comfortable for the arthroscopists and prevents any unnecessary

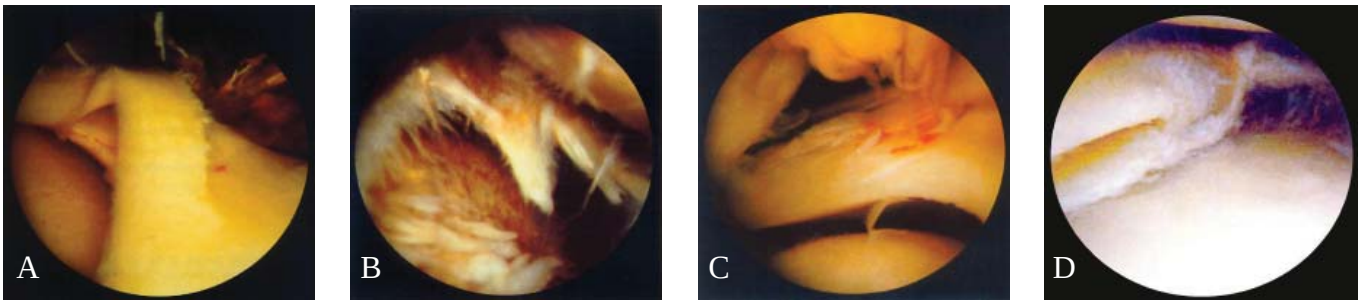

Figure: A. Bucket handle tear of medial meniscus; B. Severe degeneration of lateral meniscus with tears of meniscus in marked osteoarthritis of knee; C. Longitudinal tear in posterior horn of lateral meniscus; D. Horizontal tear of lateral meniscus

obstruction during the procedure.

After the induction of anesthesia, the tourniquet was inflated with a pressure of about 400mm of Hg.

Anterolateral portal located 1cm above the lateral joint line and approximately 1cm lateral to the edge of patellar tendon in a 30 degree flexed knee was selected for initial insertion of arthroscope and marked. With the help of a surgical knife blade (No-11) a vertical incision was given over the marked area through the skin, capsule and synovium carefully by keeping the direction of the cutting edge of the knife upwards and thus avoiding damage to the intraarticular cartilage and menisci in all the patients.

After inserting the arthroscope carefully through the portal, the joint space was inflated in all the cases using normal saline. We preferred not to use air for distensions of joint due to risk of possible air embolism. The bottles of normal saline were kept hanging high above the level of the knee joint to keep a constant pressure of solution in the knee joint. During the arthroscopic examination, knee joints were examined in the order, Suprapatellar and patellofemoral joint, medial gutter, medial compartment, intercondylar notch, posteromedial compartment, lateral compartment and lateral gutter and posterolateral compartment.

Results

Plain x-rays of all the patients were obtained and revealed no significant signs helpful in diagnosing the disease. The only symptoms revealed were soft tissue swelling, degenerative changes in the bone and cartilage of the articular surfaces of knee joint. All these patients under-went arthroscopic examination within two days of their last clinical examination. The arthroscopic examination showed the exact nature of lesion in the affected knee joints At arthroscopy, a meniscal injury was found in 57 knees (medial meniscus 39, lateral meniscus 18). Two patients among them were found with bilateral meniscal injury. of a total of 55 patients with meniscal tear, 6 had additional findings like partial tear of ACL in 3 patients, additional lesion of medial meniscus in addition to the lateral meniscus in 2 patients and chondromalacia patella in 1 patient. 61 Patients were male while 13 patients were female.

3 patients were found between the age of 10 to 19 years, 21 patients were found between the age of 22 to 29 years, 25 patients were found between the age of 30 to 39 years, 12 patients were found between the age of 40 to 49 years, 3 patients were found between the age of 50 to 60 years while 10 patients were found above the age of 60 years.

Meniscal lesions were commoner in the right knee (56.5%) and 79% of the patients were men. Of the medial meniscus tears, 54% were longitudinal tears, 24% were horizontal tears, 12% oblique tears, 8% radial tears and 2% were degenerative tears. Superior flaps were six times more common than inferior flaps. Of all medial meniscus fragments, 6% were inverted; 51% of these were flaps and the rest ruptured bucket-handle fragments.

Of the lateral meniscus lesions, 48% were longitudinal tears, 29% horizontal, 16% radial tears, 5% were oblique tears and 2% degenerative

tears.

In this prospective study focused on the lesion of meniscus the overall success rate of clinical history and examinations was 74%.
Total number of cases with clinical diagnosis were 74. Arthroscopyically confirmed diagnosis was in 57 (77%) patients. Wrong clinical diagnosis was in 17 (23%) patients.

Discussion

In this study, the role of arthroscope was reviewed in seventy four patients with the symptoms of Meniscal Tears. The study was conducted to highlight the significance of arthroscopy in diagnosis of meniscal tears. The results of the study showed that only seventy six percent of accuracy of clinical findings in comparison with arthroscopic findings.

A 30 degree arthroscope was used in all the cases. Arthroscopies were performed under general anesthesia and spinal anesthesia with a tourniquet. Average duration of diagnostic arthroscopy was 30 minutes. A single dose of injectable antibiotic was given before operation followed by two post operative doses. All the patients were mobilized next day. Majority of the patients were discharge next day with the advice to follow OPD on regular basis.

The advent of arthoscopy has permitted better visualization of menisci. Surgeon can gain access to all aspects of menisci and management of meniscal tears has become much easier.

Arthroscopy in meniscal tears has significant advantages over other surgical procedure. Common advantages are exact diagnosis, smaller incision, less intense inflammatory response, reduced post operative morbidity, absence of secondary effects, shorter hospital stay, highly impressive results and reduced complication rates and earlier return to work.

This study proves the diagnostic role of arthroscopy as no major complications were observed during the study but few minor complications were observed which were relieved within one month physiotherapy and treatment.

So it is proven in the light of this study that arthroscopy of knee joint is safe, reliable and useful diagnostic and therapeutic method for meniscal injuries with little morbidity and minor complications. Arthroscopy of knee joint is a minimally invasive surgery that can be done on day care basis with minimal discomfort, reduce cost and shortened recovery period making an ideal technique for all the patients with meniscal injuries. Surgeon can gain access to all aspects of menisci.

The common disadvantage is inadvertent damage of intra-articular structures. Instrumental breakage is also observed rarely.

Common complications are hemarthrosis, infections, thromboembolic diseases, ligament injury and neurologic injury damage to intra articular structures, menisci and fat pad and cruciate ligaments. In 1986, Small reported survey of 395556 Arthroscopies with over all complication rate of 0.56%[13].

Greis PE, et al in their research summarized that complications related to repair include neurologic injury, postoperative loss of motion, recurrence of the tear, and infection[14]. If the intra-articular pressure of the knee-joint is increased before insertion of the arthroscope, damage to the inside of knee-joint can be essentially reduced[15]. Thrombophelebitis is in fact an important complication in patients over the age of 40[16]. Arthroscopic menisal procedures as a whole have an acceptably low complication rate.[17] Williams JS Jr et al have shown incidence of DVT of 3.5% in post-operative patients.[18] Habegger R et al have suggested that the use of air specially in freshly injured joints should be abondoned.[19] Broken intsurments are mosly the fault of surgeon.[20]

Conclusion

The technique of arthroscopy has provided orthopeadic surgeon a very powerful and highly successful tool in diagnosing and treating meniscal tears. Arthroscopy offers unique advantages like exact diagnosis, smaller incision, less intense inflammatory response, reduced post operative

morbidity, absence of secondary effects, shorter hospital stay, highly impressive results and reduced complication rates and earlier return to work. Rate of complication is very rare and not possible if performed by experienced surgeon. Finally, it is concluded by this study that arthroscopy is safe and highly reliable method in diagnosing and treating meniscal tears with little morbidity and minor complications making it an ideal technique for diagnosing and treating meniscal tears.

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