ARTHROSCOPIC EVALUATION AND MANAGEMENT OF MENISCAL INJURIES OF THE KNEE

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ABSTRACT

50 cases of isolated meniscal injuries of the knee were evaluated and managed arthroscopically. 56% of the cases were in 25-35 year age group. In 80% of the cases military training and contact sports was the mode of injury. Maximum (42%) patients reported late (> 2 years) after the injury. On presentation, they had an average Lysholm knee score of 53.76. Medial meniscal lesion was seen in 74%. Commonest pattern of tear encountered was a longitudinal tear (40%). Depending on pattern and extent of lesion, partial meniscectomy (60%), subtotal meniscectomy (14%) and total meniscectomy (26%) were performed. Patients were followed up at six months and one year. The average Lysholm score at 6 months was 83.3 and at one year 79.5. At one year, the patient satisfaction level was 82% and patients who underwent partial meniscectomy had the best results.

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KEY WORDS :Arthroscopy; Meniscal tear.

Introduction

Menisci are shock absorbers of the knee. Traumatic lesions of the menisci are most commonly produced by rotation as the flexed knee moves towards an extended position. Such injuries are common in people taking part in contact sports and are commonly encountered in soldiers of Armed Forces. Meniscal lesions are notorious for lack of healing ability due to their restricted blood supply limited to the peripheral third [1].

In earlier times the only way to manage any meniscal injury was to go in for an open excision [2,3]. This procedure was invasive and proved to be undesirable for good joint function. The first meniscal tear to be partially excised under arthroscopic control was by Dr Masaki Watanabe in Tokyo in the year 1962. Using an arthroscope not only one can clearly and definitely establish the pattern of injury but one can also perform microsurgical procedure [4]. Arthroscopy has revolutionized the management of meniscal injuries [5,6].

Material And Methods

50 patients with meniscal lesions of the knee admitted to Command Hospital (Southern Command), Pune and Military Hospital Kirkee complex during the year 1998-99, formed the material for this study. To ensure proper evaluation of long term effects of arthroscopic meniscectomy, all patients with associated intra-articular lesion were excluded from the study. Subjective scoring with Lysholm score was followed by detailed examination of the patient for detecting any meniscal pathology. All the patients were put on preoperative physiotherapy in the form of isometric quadriceps and hamstring exercises. The arthroscope used was Dyonics

(Fig-1). The arthroscope had the facility of closed circuit video monitoring and recording. The instrumentation used was of Acufex company (Fig-2). All patients were given spinal/epidural anaesthesia with Lignocaine / Bupivacaine. After anaesthesia all patients were subjected to clinical tests for meniscal and ligamentous injury to confirm the clinical diagnosis. The joint was thor-

Fig. 1 : Dyonics Video - arthroscope with closed circuit monitoring (complete assembly)

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Fig. 2 : Acuflex instruments with video camera head and shaver handle

Fig. 3 : Bucket handle tear

Fig. 4 : Steps of excision of bucket handle tear

oroughly examined by anterolateral portal using the 30 degree scope in sequential manner. The meniscal tear was confirmed by probing. We came across a variety of tear patterns of both medial and lateral meniscus, longitudinal, either intrameniscal or peripheral, complete or incomplete, displaced or nondisplaced, bucket handle (Fig-3), horizontal, oblique, radial, flap (Fig-6), complex, and degenerative. The operative technique used was as per the lesion. The decision to save a stable rim of menisci by undertaking partial/subtotal meniscectomy was the critical one, the goal which was kept in mind was to by and large remove all ruptured and offending meniscal tissue (Fig-4) and leave a stable rim of meniscus.

Fig. 5 : Balancing of residual rim of meniscus

Fig. 6 : Flap tear, being excised

However in some patients degenerative changes and ruptures were present within the entire meniscus and the rupture reached as far as the synovial junction, these were the cases in which total meniscectomy was performed. In most of the cases partial meniscectomy was kept as the first choice of treatment, it was always preferable to subtotal or total meniscectomy. Excision of the pathological tissue was carried out either with en bloc resection of the mobile fragment or by morselisation of the fragment and subsequent removal. Sharp excision or major fragment was preferred to morselisation to minimise potential debris within the joint. After excision of the tear, the remaining peripheral rim was carefully probed to look for additional tear and to see whether the rim was balanced and stable (Fig-5). In the end the joint was thoroughly lavaged to ensure removal of meniscal fragments. All patients were put on physiotherapy schedule postoperatively. The sutures were removed on the 7th day. All patients were discharged within 10th postoperative day. Patients were followed up at 6 months and at the end of one year.

Results

50 cases of meniscal injuries of the knee were studied. All the patients included in the study were soldiers of the Army. In our series the maximum number of patients (16) were grouped between 30-35 years of age (32%). The distribution is shown in (Table-1). The most common modality of injury was military training and contact sports like football, hockey, kabaddi etc (32%). Other modalities were as shown in (Table-2). Patients had presented after varying periods of delay following their injury. Maximum number of patients (21:42%) reported very late (>2 years), after

their initial injury. There were only a couple of patients (4%) who reported within 48 hours of their injury. Chief complaint of all patients was a painful swelling of the involved knee which kept recurring. However they had various associated complaints like limp (88%), locking of the knee joint (84%), instability (68%) difficulty in climbing staircase (52%) and difficulty in squatting (44%).

TABLE 1
Age distribution of cases

Age (Yr.)	Cases (50)
20 - 25	13 (26%)
26 - 30	12 (24%)
31 - 35	16 (32%)
> 35	09 (18%)

TABLE 2
Distribution as per modality of injury

Mode of injury	Cases
Contact sports	16 (32%)
RTA	10 (20%)
Jumping	09 (18%)
Running	08 (16%)
Slipping	07 (14%)

TABLE 3
Distribution of associated clinical signs

Clinical sign	Cases
Effusion	41 (82%)
Joint line tenderness	44 (88%)
< 100° flexion	22 (44%)
Flexion deformity < 10°	18 (36%)
Positive McMurrays test	100%

The Gillquist Lysholm score was used to grade knee function. Most of the patients (41.82%) had fair to poor scores for the involved knee, preoperatively. The scores varied from as bad as 21 to as good as 89 with an average score of 53.76. On clinical evaluation, right knee was involved in most of the patients (30.60%). Large number of patients presented late to us and hence quite a few of them had wasting of the quadriceps muscle ranging from 1 to 5 cm, other clinical findings recorded were as per (Table-3). Medial meniscus was thought to be the culprit in 34(68%) cases and in the rest (16.32%) lateral meniscus was injured. During arthroscopy maximum number of tears were longitudinal (20) out of which 8 were Bucket-handle tears. Other patterns of tear seen is given in (Table-4). Out of the 50 cases, in 30 partial meniscectomy was performed. Based on the extent and type of meniscal lesion, the distribution of partial, subtotal and total meniscectomy carried out is as shown in (Table-5).

At six weeks follow up patients had few residual symptoms of mild pain and swelling, however most of their symptoms had subsided. In view of short time interval since surgery, the final symptomatic evaluation and grading of results were left for the next follow up. At six months all patients reported for review. Almost all of them had recovered completely clinically, but few continued

TABLE 4
Distribution of various patterns of tear

Type of tear	Medial meniscus (37)			Lateral meniscus (13)		
	Ant	Mid	Post	Ant	Mid	Post
Longitudinal (20)						
Complete (02)	—	01	—	—	01	—
Incomplete (10)	03	03	02	02	—	—
Bucket - handle (08)						
Incomplete (03)	02	01	—	—	—	—
Complete (03)	03	—	—	—	—	—
Double (02)	02	—	02	—	—	—
Flap (06)						
Superior (05)	03	—	01	01	—	—
Inferior (01)	—	—	01	—	—	—
Parrot beak (03)	—	02	01	—	—	—
Radial (03)	—	01	—	—	—	02
Horizontal (03)						
Complete	—	01	—	—	—	—
Incomplete	—	—	—	—	02	—
Complex (03)	—	02	—	—	01	—
Degenerative (03)	—	02	—	—	01	—

TABLE 5
Distribution as per type of meniscectomy performed

Type of tear	Partial Meniscectomy	Subtotal Meniscectomy	Total Meniscectomy
Longitudinal (20)	14	04	02
Oblique (9)	07	-	02
Flap (6)	04	01	01
Parrot beak (3)	02	-	01
Radial (3)	02	01	-
Horizontal (3)	01	01	01
Complex (3)	-	-	03
Degenerated (3)	-	-	03
Total (50)	30	07	13

to have some residual symptoms. All patients were evaluated symptomatically by Lysholm Score and radiographically. The minimum Lysholm score was 67 points and the maximum 96 points. The improvement in Lysholm scores and results are shown in (Table-6). Partial meniscectomy had the best results. 7 (14%) patients had evidence of early degenerative changes. Out of 7 patients who had early degenerative changes 5 patients had undergone total meniscectomy and 2 patients had undergone partial meniscectomy. There were no poor results at 6 months follow up.

Patients were called for review after one year. Total 40 patients were reviewed at the end of one year of their surgery. On taking plain antero-posterior radiographs of the involved knee 12(24%) patients had evidence of early osteoarthritic changes. Out of these 10 patients had undergone total meniscectomy and 2 patients partial meniscectomy. The minimum Lysholm score obtained was 63 and maximum 98. Out of these 31 (78%) patients had decrease in their Lysholm score by 2-11 points and 9 (22%) patients had increase in Lysholm score [7] by 2-10 points. 19(47%) patients could carry out their normal activities as per their requirement, 14 (35%) patients had mild restriction in their usual activities and a few (7.18%) had restricted activities. In the end patient satisfac-

TABLE 6

Distribution of patients as per improvement in Lysholm scores and the results of surgery

↑ Lys. score	At six months	Result	At six months	Partial meniscectomy	Subtotal meniscectomy	Total meniscectomy
< 20 points	15 (30%)	Fair	09 (18%)	04	-	05
20-40 points	21 (42%)	Good	29 (58%)	15	06	08
> 40 points	14 (28%)	Excellent	12 (24%)	11	01	

tion regarding surgery was assessed. Majority of patients (82%) were satisfied with the surgery and 18% unsatisfied.

Discussion

Arthroscope has become a very important part of an orthopaedic surgeons armamentarium. It not only helps him look into the closed environs of a joint but also makes surgical intervention possible without having to open the joint. It has improved the accuracy of diagnosis and decreased the morbidity due to various joint diseases [8]. Meniscal lesions are one of the commonest intraarticular injuries and arthroscopy is the best method of diagnosing and managing these lesions. Good results have been reported for meniscal resective techniques.

Against this back-ground our study was carried out, the age of the patients in our series ranged from 21-49 years with an average of 36.6 years. However maximum number of patients (56%) were in the 25-35 year age group. In the study conducted by Russell J.A. Tregonning [9] the mean age was 27 years, ranging from 15-54 years. In a similar study conducted by Gillquist J [10] the range was from 18-78 years and average age was 39.7 years. The maximum number of patients were between 25-35 years of age in both the series. In the present series the commonest mode of injury was military training and contact sports (32%) in all, the contribution of athletic injuries towards meniscal lesions was 72%. When compared, the studies conducted by John B, McGinty [11], Russell JA, Tregonning, Gillquist J [10] also had athletic injuries as the commonest cause for meniscal lesions. The average delay in presentation in our series was 467 days (15.5 months) which ranged from a few days to six years. Most of the patients reported very late after their injury (> 2 years; 42%). When compared in the study done by Russell JA. Tregonning, there was an average delay of 15.5 months ranging from a few days to 10 years and in the study by Gillquist J 85% of patients reported after more than 3 months. In a similar series Northmore-ball MD [12] observed more than 6 months delay in 70% patients. It is observed that there was a tendency of neglecting these injuries in the patients, once their initial symptoms subsided. As

evaluated by Lysholm score most of the patients in our series had poor to fair function of the knee joint at presentation, with score below 77. On comparing the clinical findings with the series published by John B. McGinty, Russell J.A. Tregonning, Gillquist J it is found that effusion joint line tenderness and wasted quadriceps muscle was seen in more than 85% of cases. McMurrays test was again the basis of clinical diagnosis in all these studies and the ratio of medial meniscal to lateral meniscal lesion was observed varying from 10:1 to 7.8:2.1; in our study the ratio was 6.8:3.2. However none of the studies done in the past have described the distribution of location of meniscal tear as per the McMurrays test. In our study we found that the lesions of the anterior and posterior segments were more common than a middle segment lesion (3:1) more so in the lateral meniscus (6:1).

Radiographic analysis was carried out on the involved knee to exclude any degenerative lesion, this helped proper comparison of the cases as regards success of arthroscopic meniscal procedures. On arthroscopy we came across 37 (74%) medial meniscal lesion and 13 (26%) lateral meniscal lesion. This was slightly different from our clinical evaluation in which we had suspected 68% medial and 32% lateral meniscal lesion. A few cases suspected to have lateral meniscal lesion actually were confirmed to be medial meniscal lesions on arthroscopy. Hence our clinical diagnosis was not always correct, this compares well with published reports comparing the efficacy of clinical diagnosis as compared to arthroscopy [13].

In our study, maximum cases (40%) were cases of longitudinal tears. Tears seen in long standing cases were flap tears, complex and degenerative tear. Amongst the tears radial tears were infrequent and were found more in the lateral meniscus and longitudinal tears which were commonest had predilection for medial meniscus. Parrot beak tears in our study were only found in the medial meniscus which were infrequent. Similarly bucket handle tears were common in the medial meniscus. Degenerated and complex tears were seen in both medial and lateral meniscus. In long standing cases we observed flap tears. In our present series we tried to save the meniscus as far as

possible by performing partial meniscectomies (30.60%). However in a few cases of complete horizontal tear, oblique and radial tear we had to carry out subtotal (07.14%) and total meniscectomies (13.26%). For complex and degenerated tear we preferred total meniscectomy.

On follow up at six months all the patients had moderate to marked improvement in their symptoms. Out of these partial meniscectomy had best results. The average Lysholm score at the end of one year was 79.5 points as against 83.3 points seen at 6 months duration. While critically analysing we found out that 78% of the patients had a decrease in their Lysholm scores by 2 to 11 points whereas 22% improved their scores by 2 to 10 points. This showed that while there were patients who continued to improve there were patients who had started to show decline in their improvement as time progressed. Amongst the patients who improved (22%) all were from the group of patients who underwent partial meniscectomy. More than 80% of the patients who underwent partial meniscectomy were able to undertake normal level of activities. All the patients who underwent subtotal meniscectomy had mild restriction of their activities whereas out of those who underwent total meniscectomy only 8-10% retained normal activities and the rest had mild to moderate restriction of their activities. In the end patient satisfaction was assessed as regards their surgery. It was found that 82% of the patients were satisfied with their surgery with full recovery or near full recovery whereas 18% of the patients were not satisfied with their surgery due to inability to go back to the activities of pre-injury level. However out of these 18% patients a few of them had reported late and had high expectation from their surgery and hence were disappointed with the compromised results.

In conclusion, the results of partial meniscectomy which were better than subtotal and total meniscectomy, improved over a period of time whereas that of subtotal and total meniscectomy which were slightly

inferior to begin with, deteriorated even further over a period of time. Arthroscopy is a very effective modality of diagnosing and managing meniscal injuries of the knee joint. Most of the meniscal lesions can be tackled arthroscopically by partial, subtotal or total meniscectomy.

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