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Ambulatory Arthroscopic Knee Surgery Results of Partial Meniscectomy

Pages with reference to book, From 210 To 213

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Abstract

In an open prospective study the results of arthroscopic partial meniscectomy were reviewed in 188 knees. Group I comprised of 139 (65%) knees with pure meniscus lesions without any ligament laxity, the remaining 49 (35%) knees in group II had anterior cruciate ligament (ACL) deficiency in addition to meniscus lesions. In group I, 93% had excellent to good and 7% had fair results by criteria of Tapper and Hoover¹. In group II, 75% had excellent to good and 25% had fair results. Arthroscopic knee surgery was a good method of identifying patients in group II who required anterior cruciate reconstruction. One hundred (53%) sedentary workers were able to return to work at a mean time of 3 weeks. Patients classified as heavy labour comprised of a group of 40(21%) were able to return to their occupation in the mean time of 5 weeks. School and college students numbered 28 (14%) were able to go to their institutions in the mean time of 10 days. Twenty (9%) patients were professional or semi-professional athletes who were permitted sports training in 3 weeks and sports participation in 6 weeks on the average. There were no serious complications including wound infection, deep venous thrombosis (DVT) or loss of knee motion. The arthroscopic technique is reliable, cost effective and has high patient acceptance because of low morbidity and rapid return of good function to the knee joint (JPMA 47:210,1997).

Introduction

The first Arthroscopic Meniscectomy was performed by Masaki Watanabe² in Japan in 1962 and was introduced in North America by O'Connor³ in 1977 including an operating arthroscope. Dandy⁴, Jackson⁵, Gillquist⁶ and Metcalf⁷ have been among the early pioneers 'contributing to the development of arthroscopic surgical techniques, operating micro-instruments and power tools. The morbidity of arthroscopic meniscectomy of the knee is so low and return to normal function and sports activities so rapid that this technique has become very popular among the patients. Endoscopic surgery has virtually replaced open meniscus surgery wherever expertise in endoscopic surgery of the knee is available. Arthroscopic surgery of the knee was started at the Aga Khan University Hospital in April, 1990. Until December 1995, 221 such procedures have been done. The purpose of this study was to evaluate the effectiveness, safety, patient acceptance and economy of arthroscopic knee surgery in ambulatory settings in Karachi, Pakistan.

Patients and Methods

In an open prospective study, 221 patients underwent knee arthroscopy with a clinical diagnosis of torn meniscus, from April 1990 to December, 1995. The complaints in order of frequency were pain, inability to squat, giving way and recurrent knee swelling. The positive signs in order of frequency were joint line tenderness, obvious or subtle loss of terminal flexion or extension and joint effusion. One hundred and fifty (68%) patients had MRI of the knee confirming the diagnosis of torn meniscus while in the remaining 70 (32%), only the clinical diagnosis was relied upon. Internal derangement of the knee was a chronic problem (duration one year or more) in 180(90%) patients. Additional diagnosis

of anterior cruciate ligament (ACL) deficiency was made in 31 knees clinically and in another 15 on MRI. These cases fell into two distinct groups. Group I consisting of pure meniscus lesions without any ligament laxity and group II with ACL deficiency in addition to meniscus lesions. The arthroscopic surgery was carried out as an ambulatory procedure under general/spinal anaesthesia except when patients were from out of town necessitating overnight hospital stay in 30 individuals.

Efforts were made to perform partial meniscectomy and preserve a stable functional meniscus in all cases whenever possible.

Debridement of ACL stump was only done if it was felt to interfere with joint function. Incidental removal of cartilaginous/osteocartilaginous loose bodies were also carried out in 30 knees. Eight knees in group I with no unstable meniscus lesions on arthroscopy were excluded from the study, although, all these patients were reported to have complete tears of posterior third of medial meniscus on MRI. Four ACL deficiency knees in group II found to have no unstable meniscus lesion on arthroscopy were excluded from the study with recommendation of anterior cruciate reconstruction surgery. Patients were given long acting local anaesthetic (15 ml 0.5% Bupivacaine hydrochloride - 75 mg) intraarticularly at the end of the procedure and lower limb immobilized in a supportive dressing which provided very effective pain control for 12-24 hours post-operatively. Postoperatively patients were instructed in isometric quadriceps exercises and allowed partial weight bearing on the lower limb as tolerated with walking aid. Patients were seen in the clinic on 3rd to 5th post-operative day when dressings were removed and range of motion (ROM) and resistive muscle strengthening exercises were instituted. Further follow-up consisted of weekly check-ups for three weeks and then bi-weekly until the patient fully recovered, usually within 8 to 10 weeks. At the time of discharge, patients were encouraged for follow-up visit at 3 months and one year post-operatively. Follow-up varied from a minimum of three months to a maximum of 4.5 years with a mean of 3.4 years in 90% of the patients in this study.

Results

One hundred ninety-three arthroscopic partial meniscectomies were performed in 188 knees. Five knees had simultaneous operations on torn medial and lateral menisci in ACL deficiency group. Group I with pure meniscus lesions without any ligament instability comprised of 139 patients with an age range of 14 to 50 years (mean 31 years) and male to female ratio of 10:1. Bucket handle and longitudinal tears were more common in younger patients with no or minimal degenerative changes in the joint. Cleavage and flap tears were prevalent in older patients with significant degenerative changes. Fifty-eight (40%) patients had sports related injuries, whereas, 65 (45%) patients had injured their knees during minor accidents and other activities of daily living and in 22 (15%) patients no definite injuries were reported.

Group II with ACL deficiency comprised of 49 knees (three knees added to the group based on arthroscopic findings) in 47, all male patients with an age range from 16 to 32 years (mean 25 years). Significant injury related to sports activities or vehicular accidents was noted in all patients. Forty-two (80%) knees had significant degenerative changes in the medial/lateral or both compartments. Medial to lateral meniscus lesion ratio was 3:1 in both groups. Knees in group I and II were evaluated separately using Tapper and Hoover's criteria of grading each knee as excellent, good, fair or poor. Excellent, a normal knee; good, the knee was functional in all activities including vigorous sports, but with some aching or swelling afterwards; fair, a knee giving definite symptoms and some disability, preventing vigorous sports; poor, a knee giving symptoms which interfered with routine daily activities.

Table I. Results and comparison between group I and II.

| | Group I | Group II |
|---------------|---------|----------|
| Cases (No) | 139 | 49 |
| Excellent (%) | 54 | 25 |
| Good (%) | 39 | 50 |
| Fair (%) | 7 | 25 |
| Poor (%) | 0 | 0 |

Table I shows functional grade and comparison between the two groups. Nine (7%) patients in group I in fair category, were mostly older patients with degenerative changes in the joint, who were symptomatic during sports activities such as squash, cricket and running. In Group II, all patients had unstable meniscus lesions in addition to ACL deficiency. Thirty-six (75%) patients benefitted from the procedure even though they had mild symptoms on demanding activities. Twelve (25%) patients in fair category continued to be symptomatic and were recommended to have anterior cruciate reconstruction surgery.

Occupational status:

One hundred (53%) patients were sedentary workers and were able to return to work at a mean time of 3 weeks. Forty (21%) patients involved in physically demanding industrial, agricultural or outdoor work, were able to return to their occupation in the mean time of 5 weeks. Twenty-eight (14%) patients were school or college students who were able to go to their institution in the mean time of 10 days. Thirty (9%) patients were professional or semi-professional athletes who were permitted sports training in three weeks and sports participation in 6 weeks on the average. No significant complications were noted in this series including infection, DVT or loss of knee motion. The results of this series are compared with open total meniscectomy series of Tapper and Hoover¹ in Table II.

Table II. Closed vs open meniscectomy.

| | Closed partial meniscectomy Umar 1997 | Open total meniscectomy ⁷ Tapper and Hoover 1969 |
|---------------|--|--|
| Cases (No) | 188 | 125 |
| Excellent (%) | 54 | 38 |
| Good (%) | 39 | 30 |
| Fair (%) | 7 | 19 |
| Poor (%) | 0 | 13 |

The results of endoscopic partial meniscectomy are superior to traditional open meniscectomy. This is borne out by other endoscopic surgical series as well^{4,8}. Arthroscopic partial meniscectomy

results of the present series are compared with Northmore . Bail and Dandy⁸ (Table III).

Table III. Results of arthroscopic meniscectomy - Comparison of two series.

| | Umar 1997 | Northmore - Ball and Dandy ⁸ 1982 |
|--|-----------|---|
| Group I: Pure meniscus lesions | | |
| Cases (No.) | 139 | 66 |
| Excellent (%) | 60 | 51.5 |
| Good (%) | 36 | 39.0 |
| Fair (%) | 4 | 8.0 |
| Poor (%) | 0 | 1.5 |
| Group II. ACL deficiency with meniscus lesions. | | |
| Cases (No.) | 49 | 33 |
| Excellent | 25.0 | 28.0 |
| Good | 50.0 | 39.0 |
| Fair | 25.0 | 33.0 |
| Poor | 0 | 0 |

Discussion

One hundred and ninety three arthroscopic partial meniscectomies were performed in 188 knees. Arthroscopic procedure was successful in 100% of the cases, thus avoiding the need for an open procedure. MRI is a highly sensitive test for picking high intensity signals in the menisci and intrameniscal degenerative lesions especially in the posterior aspect of medial meniscus may be diagnosed erroneously as full thickness tears⁹. Of 150 (68%) patients with a meniscus tear on MRI, 8(5%) were not found to have a meniscal tear on arthroscopy. Due to the presence of false positive tears, partial meniscectomy should be restricted to those cases where unstable meniscus tear can be demonstrated arthroscopically. MRI should be done when the clinician is uncertain of both the diagnosis and need for arthroscopy. When a patient has clear cut history and typical findings of a torn meniscus, early arthroscopy will confirm the diagnosis and treat the condition in the same procedure⁹. In the current series 100 patients had MRI already done when first seen and in 80 of these, a certain clinical diagnosis of torn meniscus was possible. The overutilizations of this expensive study should be rationalized and reserved for cases of uncertain diagnosis only. The early and late results of traditional open meniscectomy have been extensively documented¹⁰⁻¹³. The recovery of function is slow, residual loss of motion, persistent muscle atrophy and compromised function occurs in 15-20% of the patients.

Progressive degenerative changes in the knee are well documented on long term follow-up^{1,10,12} So

impairment of function and disability on long term follow up is reported 30% or higher.

Tapper and Hoover¹ and Cargill and Jackson¹² suggested that partial meniscectomy caused less degenerative changes than total meniscectomy in Bucket handle tears of meniscus. In 1954 Astrand¹³ reported better results by partial meniscectomy as compared to open method. McGinty¹⁴ reported similar results in 1977. However, limiting factor with open surgery was that technique called for displaced bucket handle tears only. Arthroscopic technique affords the opportunity to inspect and manipulate the entire meniscus and identify the full extent of the lesion prior to excision. Arthroscopic technique and special instrumentation makes it possible to excise the lesion in any part of the meniscus. This selective meniscectomy aims at preserving a functioning meniscus. In this series, it was possible to accomplish the goal of selective (partial) meniscectomy in 160 (85%) knees. The remaining 28 (15%) knees required subtotal meniscectomy because of extensive and complex nature of meniscal tears.

Arthroscopic partial meniscectomy is superior to traditional open meniscectomy because of the low morbidity, rapid rehabilitation, high patient acceptance and early return to work and sports. In the long run it is hoped that selective arthroscopic meniscectomy will minimize the degenerative changes in the articular cartilage of the knee and report of long term results are encouraging⁸. Rockborn and Gilquist⁵ have reported a 13 year physical and radiographic follow-up of 43 patients under 23 years of age. At the follow-up examinations, no differences in range of motion, muscle strengths or knee stability were seen between the operated and the non-operated knees and 90% had no functional deterioration. However, 40% of the knees showed radiological progression (Fairbank's changes) on the operated knees when compared to only 10% of the non-operated knees, but only 4% showed significant progression. In the present series, 80 patients with pure meniscus lesions were 30 years old or younger and only 45 had a mean follow-up of four years. Forty patients had bilateral pre-operative and recent post-operative knee x-rays available. Two (5%) knees showed degenerative changes and narrowing of medial joint space without deterioration of clinical ratings in these patients, however, duration of follow-up is only four years versus 10-13 years.

Covall and Wasilewski¹⁶ have reported radiologic changes after arthroscopic meniscectomy with five year follow-up in patients more than 45 years old. Sixty percent of post-operative knees showed radiologic progression of Fairbank's changes compared with 20% of the non-operated knees. However, significant radiologic progression was noted in 15% in the operated knees and 11% in the non-operated knees. In the present series patients above 45 years of age with a minimum follow-up of four years was only 15. This number is too small for meaningful analysis, however, trend of degenerative changes is in keeping with the series noted above. It is quite clear that arthroscopic partial meniscectomy does contribute to degenerative arthritis of the knee on long term follow-up, however impressive relief of symptoms, minimum morbidity and maintenance of good function for many years more than justifies arthroscopic meniscectomy. The endoscopic technique is ideally suited in Pakistani settings because invasive surgery is associated with high rate of complications such as, infection and knee stiffness requiring prolonged treatment and physiotherapy especially because our medical facilities are not at par with international standards. There are significant cost savings because of elimination of hospitalization, intravenous antibiotics, quick recovery and excellent prospects for full recovery and early return to work. As arthroscopic technique involves special dexterity and hand eye coordination, many orthopaedic surgeons may never become proficient in arthroscopy. Endoscopic meniscectomy is technically difficult to perform and requires special training. Sufficient experience in diagnostic arthroscopy is necessary before attempting endoscopic surgical meniscectomy. Gentle and automatic technique is required because it is easy to injure and damage the delicate articular cartilage with careless and clumsy use of instruments during endoscopic surgery. Because of low morbidity associated with the procedure, there is a risk of excessive use of this surgical modality. The use of arthroscopy should be restricted to well defined pathological conditions and should not replace

clinical judgement as medical technology is a good servant but a bad master.

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