Arthroscopic excision of symptomatic medial plica

A study of 118 knees with 1–4 year follow-up

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We retrospectively reviewed 93 patients (118 knees) treated by arthroscopic excision of painful medial plica. A scoring scale 0–100 was used to evaluate the symptoms. After an average of 2 (1–4) years, 109 of 118 knees had little, if any, pain and the average improvement in the score was 41 points. Thus arthroscopic excision of a painful medial plica can provide lasting and satisfactory relief of symptoms.

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Plicae are flexible bands in the synovial lining of the knee. Their pathological significance is the subject of continuing controversy. Occasionally, these bands can become symptomatic and, if a trial of nonoperative treatment fails, their removal has been recommended (Patel 1978, Mital and Hayden 1979, Nottage et al. 1983, Kinnard and Levesque 1984, Dorchak et al. 1991). We evaluated the results of arthroscopic excision of painful medial plica.

Patients and methods

All patients were seen following the request of either their general practitioner or referral by other orthopedic surgeons. The precise number of patients referred to the department with anterior knee pain could not be ascertained. 123 patients were diagnosed as suffering from a medial plica syndrome solely on the basis of the following history and examination findings.

Symptoms

The presenting symptoms may vary from an intermittent ache in the anteromedial aspect of the knee brought on by energetic use or sport to constant anteromedial pain exacerbated by any activity. A history of giving way, catching or clicking may be provided. Some patients may complain of locking that resolves gradually with rest and others may report discomfort after prolonged sitting, eased by straightening the limb.

Signs

An effusion may be seen, and voluntary contraction of the quadriceps often reproduces the symptoms. The medial plica is usually palpable and runs parallel to and a thumb's breadth from the medial edge of the patella; patients with an inflamed medial plica will experience a sharp discomfort as the plica is rolled under the thumb and will recognize the painful sensation. The clinical hallmark of the plica syndrome is a tender plica: this tenderness may be exquisite or may develop, in milder cases, only during a provocation test—the flexion test. The patient must recognize the discomfort so produced.

The flexion test has been devised by the senior author. It aims to test the sensitivity of the medial plica when approximated manually against the medial femoral condyle during knee flexion by the examiner's fingers in an attempt to simulate conditions in the loaded knee. The test is positive when the patient experiences pain or discomfort that corresponds to their presenting symptoms when the knee is passively flexed no more than 6 times, while gentle pressure is maintained over the plica. The test is both superfluous and painful in patients with plical tenderness.

Routine radiographs were obtained in all cases. The 123 patients diagnosed as having a painful medial synovial plica were advised to reduce their level of activity. 11 patients either improved or moved out of our geographical area and could not be evaluated. 112 patients either did not limit their physical activities or did not experience any improvement in, spite of such modifications, and

Table 1. Scoring-scale used to evaluate symptoms before and after surgery

Criteria	Points	Number of knees	
		Pre-op	Post-op
Pain			
none	40	0	52
occasional	30	10	57
frequent	20	32	5
daily activity	10	76	4
constant	0	0	0
Swelling			
none	10	36	89
occasional	5	57	22
constant	0	25	7
Catching			
none	5	33	99
yes	0	85	19
Clicking			
none	5	30	72
yes	0	88	46
Giving way			
none	10	30	106
occasional	5	86	12
every step	0	2	0
Stairs			
no problem	10	32	107
with pain	5	79	10
unable to climb	0	7	1
Sport			
no problem	10	11	72
restricted	5	63	42
cannot play	0	42	2
Sitting			
no problem	10	25	82
occasional pain	5	43	32
always painful	0	50	4

these were offered arthroscopic excision. The final decision as to whether surgery was justifiable was made at a preoperative assessment carried out one week prior to surgery. This is because approximately 50 percent of our patients had to wait more than one year for their arthroscopy after the procedure was first offered to them. 6 patients had other concomitant lesions (medial femoral condyle articular cartilage defects, medial meniscal injury) at arthroscopy and these patients were not included in the study.

This paper reports a retrospective review of results of arthroscopic excision of symptomatic medial plicae which were the sole pathological lesion in 137 knees (106 patients) out of 778 arthroscopies carried out over a 6-year period to March 1990. Of these, 93 patients (118 knees) could be reviewed. Their mean age was 28 (8–59) years. 52 patients were female. All patients had their presenting symptoms and those at final review recorded on a scoring scale (Table 1) which gives 100 points to an asymptomatic knee. The average duration of symptoms was 3 years, and the average follow-up was 2 (1–4) years. Patients were asked to indicate their subjective evaluation of the outcome on a scale from 0–100, with 0 representing complete failure and 100 complete satisfaction.

Arthroscopic technique

A thorough inspection of the joint was carried out, using standard portals. Excision of the medial plica was carried out using a sucker punch inserted through the anteromedial portal. The ligamentum mucosum was removed if it interfered with the arthroscopy. Care was taken to ensure that the entire length of the plica was excised from its origin at the suprapatellar plica (just proximal to the patella) down to the fat pad. Following surgery, the tourniquet was deflated, the joint irrigated copiously with saline and injected with 15–20 mL of 0.5 percent Bupivacaine hydrochloride (Marcain).

All patients were prescribed Flurbiprofen (Froben) for 5 days, unless it was specifically contraindicated. Each patient was mobilized by a physiotherapist postoperatively on the day of the operation to help them get back on their feet and, if satisfactory, discharged the same day. All procedures were carried out by the senior author. Patients were reviewed at 2 weeks after surgery and those slow to recover their mobility were sent for further physiotherapy. The final assessment was obtained by telephoning the patients and from their hospital records.

Results

5 knees developed a post-operative hemarthrosis, which was treated by aspiration. This did not affect their final outcome. 1 patient developed Sudeck's atrophy, but recovered after about 6 months of physiotherapy and acupuncture. The plica score averaged 40 (10–80) preoperatively and 83 (30–100) postoperatively (Table 1). This difference was significant (Wilcoxon matched pairs signed rank test, $P < 0.001$). 111 knees scored over 60 and 59 knees (50 percent) scored above 80 points at review. Overall, the average improvement in the plica score was 43 (0–80), with 81 knees (69 percent) improving over 30 points. 2 knees were unchanged after surgery. We could find no correlation between the duration of symptoms prior to surgery and the final result (Spearman coefficient 0.17). There was a moderately negative correlation (Spearman coefficient –0.66) between the preoperative scores and the postoperative improvement in scores.

Discussion

Pipkin (1950) described the anatomy of synovial plicae in detail. Subsequent studies have suggested that the incidence of asymptomatic plicae ranges from 20–60 percent of knees (Patel 1978, Mital and Hayden 1979, Zanoli and Piazzai 1983). 3 types are recognised: the infrapatellar plica (ligamentum mucosum) extending from Hoffa's fat pad to the intercondylar notch, the suprapatellar plica that can completely separate the suprapatellar pouch from the knee joint, and the medial plica, which forms a crescent-shaped projection running from the suprapatellar plica to the fat pad and is most often the cause of symptoms (Zanoli and Piazzai 1983).

The medial plica may become symptomatic for a wide variety of reasons, e.g., trauma, too much sport, joint laxity, or a combination of these factors. Once initiated, a painful plica will usually persist due to swelling, reduced pliability or fibrotic change. This causes it to bowstring across the medial femoral condyle setting up a traumatic synovitis (Hardaker et al. 1980, Zanoli and Piazzai 1983, Kinnard and Levesque 1984). Hughston and Andrews (1973) are of the opinion that symptoms are produced when the plica interferes with the normal excursion of the quadriceps mechanism. Selective vastus medialis obliquus exercises or hamstring-stretching (Nottage et al. 1983, Dorchak et al. 1991) may alter extensor mechanics and relieve symptoms, but we have found this difficult to achieve and not reliable. Mital and Hayden (1979), Hardaker et al. (1980), Zanoli and Piazzai (1983) O'Dwyer and Peace (1988), Dorchak et al. (1991) have shown that total excision of an irritated plica will usually relieve the symptoms in the majority of patients who have no response to a reduction in level of activity. Consequently, we employ no conservative treatment for the condition other than to advise the patient that the syndrome is benign and a reduction in physical activity may improve their symptoms. Often patients have tried this themselves but find it impractical to do so because even ordinary day-to-day activities may aggravate their symptoms.

Over 50 percent of our patients had to wait over a year before they could have their arthroscopy, yet less than 5 percent felt improved enough to decline surgery at their preoperative assessment. It is therefore unlikely that the medial plica syndrome is a self-limited condition. A study (Sandow and Goodfellow 1985) of the natural history of anterior knee pain in adolescent girls showed that 94 percent of patients continue to have pain in the long term and that this persists or deteriorates with time in over 53 percent. The authors made no attempt to establish the underlying condition responsible for the patients' presentation. We believe that a substantial proportion of such patients may suffer from a painful medial plica and, provided this is confirmed clinically by a careful history and examination, they should be offered arthroscopic excision. Indeed, elaborate diagnostic imaging to demonstrate a plica is not helpful as the mere presence of one does not mean that it causes the symptoms. In our practice, a plica is considered pathological if it causes anteromedial pain and is tender or at least causes a positive flexion test. We know of no way other than by careful clinical examination to distinguish between a symptomatic and normal plica. All patients in this study had been diagnosed as having a painful medial synovial plica preoperatively and the plica was not excised simply because no other abnormality was visualized at arthroscopy.

We believe that the medial plica syndrome is underdiagnosed and consequently, many patients undergo a normal arthroscopic examination (Zanoli and Piazzai 1983) following which their symptoms remain unchanged. This is not surprising in view of the report by Jackson et al. (1982) that 18 patients out of 22 with pathological plicae did not benefit from diagnostic arthroscopy alone. Mital and Hayden (1979) reported similarly that 7 out of 9 of their patients who had undergone a diagnostic arthroscopy for the condition were not relieved of symptoms until their plica was excised in a separate procedure. The other 2 who did not have surgery continued to complain of symptoms.

Hardaker et al. (1980) have previously reported excision of plicae in 61 knees, with excellent results in 53. However, as 53 knees had open excision and 13 underwent additional intra-articular procedures the benefit of arthroscopic plical excision, if any, was obscured. Dorchak et al. (1991) described the results of arthroscopic treatment of synovial plicae in 51 patients. The patient material included suprapatellar and lateral plica and also a few patients who underwent arthroscopic release rather than complete excision. Vaughan-Lane and Dandy (1982) reported 55 patients treated by arthroscopic excision of the medial synovial shelf. Of 26 patients with localized shelf pain alone, over 98 percent had good or excellent results. Jackson et al. (1982) reported that 50 of 54 patients with a pathological plica improved or achieved excellent results following arthroscopic excision. Other reports (Patel 1978, Nottage et al. 1983, O'Dwyer and Peace 1988) have confirmed excellent or good results in over 88 percent of patients following plical excision. Our results have

been similarly gratifying.

Plical symptoms have been reported to recur if the plica is treated by incision alone (Mital and Hayden 1979, Hardaker et al. 1980, Jackson et al. 1982, Kinnard and Levesque 1984) because the structure may form again. Munzinger et al. (1981) found a recurrence of symptoms in one-third of their patients who had been treated by incision alone and recommend excision. The majority of their patients had been treated by arthrotomy.

Various authors (Vaughan-Lane and Dandy 1982, O'Dwyer and Peace 1988) have previously noted that there is controversy about whether or not the medial plica can cause symptoms. This review, together with the other studies, suggests that the condition does exist and can be treated successfully in the majority. Since this is a retrospective uncontrolled study, we are unable to draw any absolute conclusions from this work alone, but present it as a sizeable series with a good clinical outcome. While we have been unable to quantify the ameliorating effect a placebo might have had on our patient population, this may not have been substantial, given the disappointing experience of other authors with arthroscopic washout for the condition. While its precise mechanism remains unproven, arthroscopic excision is a reliable surgical procedure associated with a low morbidity and high degree of satisfaction in patients with anteromedial knee pain and a tender medial synovial plica.

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