THE SYNOVIAL SHELF SYNDROME

T. VAUGHAN-LANE, D. J. DANDY

From Newmarket General Hospital and Addenbrooke's Hospital, Cambridge

Fifty-eight patients (67 knees) underwent arthroscopic division or excision of the medial synovial shelf. Fifty patients (55 knees) were reviewed after a mean period of 19.8 months (range 12 to 30). Satisfactory results were obtained in patients with pain and tenderness localised to the medial synovial shelf, and unsatisfactory results in those with abnormalities of the patellofemoral joint.

Although the synovial shelf syndrome has come into prominence during the last decade with the wider use of the arthroscope, the anatomy of the synovial folds within the knee was described much earlier (Mayeda 1918; Iino 1939). The medial synovial shelf, also known as Iino’s band, Aoki’s ledge (Aoki 1973), the meniscus of the patella, the plica synovialis mediopatellaris and the plica alaris elongata, crosses the medial suprapatellar plica and runs in the coronal plane to be inserted in the infrapatellar fatpad. The medial shelf, which is present in 45 to 50 per cent of patients (Fujisawa, Jackson and Marshall 1976; Sakakibara 1976) is of variable width, and comes to lie in close contact with the medial femoral condyle when the knee is flexed beyond 30 degrees. Irritation of the medial synovial shelf can give rise to the “synovial shelf syndrome” or “plica syndrome”, the essential features of which are pain and tenderness in the line of the medial synovial shelf when the knee is flexed for long periods, without pain on patellofemoral compression (Fujisawa et al. 1976; Sakakibara 1976; Patel 1978). The pain may be so well localised that the patient points to the site of the shelf with the index finger when asked to indicate the painful area.

The medial synovial shelf must be distinguished from the medial suprapatellar plica (Harty 1978; Patel 1978; Dandy 1981) which seldom causes symptoms unless it forms a complete suprapatellar membrane (Jackson and Dandy 1976). The medial synovial shelf has a lateral counterpart which is smaller, does not lie close to the lateral condyle, and is seldom the cause of symptoms. A fourth fold, the infrapatellar fold, is well described in standard anatomical texts (Gray’s Anatomy 1980) and runs from the infrapatellar fatpad to the apex of the intercondylar notch.

The synovial shelf syndrome is usually found in adolescents during the adolescent growth spurt, and may follow a blow to the anteromedial aspect of the knee. Any generalised synovitis will lead to inflammation of the medial synovial shelf and the features described above are only suggestive of the synovial shelf syndrome if the rest of the knee is normal. This paper describes 67 knees in which the medial synovial shelf was either divided or excised, with special reference to the clinical features associated with a successful result and the indications for operation.

CLINICAL MATERIAL AND METHOD
Fifty-eight patients underwent arthroscopic excision of the medial synovial shelf, with immediate mobilisation and return home within 48 hours. Both knees were operated upon in nine patients to make a total of 67 knees. The mean age of the patients was 18 years (range 12 to 32 years); 38 (65 per cent) were female. Two patients had undergone a previous patellectomy and one a previous medial meniscectomy, without relief of their symptoms. The nature of the symptoms, duration of symptoms, and the findings of clinical examination and arthroscopy were recorded.

The results were graded as excellent if the patient was free of symptoms, good if there was mild aching only and the symptoms had improved, fair if the symptoms were unchanged, and poor if the symptoms had deteriorated since operation. Fifty patients (55 knees) were traced and reviewed by questionnaire or clinical examination between 12 and 30 months after operation (mean 19.8 months).

RESULTS

Features at presentation
Symptoms. The commonest complaint, present in 48 knees, was of pain in the front of the knee after prolonged sitting and when climbing or descending stairs; there was deep pain arising from behind the patella in 30 knees; and pain on the medial side in 13 knees. No patient had true mechanical locking but there were transient episodes of clicking or catching which was

T. Vaughan-Lane, FRCS, Squadron Leader, Royal Air Force Medical Branch
Royal Air Force Hospital, Wegberg, BFPO 40

D. J. Dandy, FRCS, Consultant General Surgeon
Newmarket General Hospital, Exning Road, Newmarket, Suffolk, England.

Requests for reprints should be sent to Mr D. J. Dandy.

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often described as locking in 26 knees; 11 knees suffered episodes of giving way. There was swelling in nine knees.

**Clinical findings.** Clinical examination revealed tenderness over the medial synovial shelf in 45 knees. The shelf could be felt moving over the femoral condyle in flexion and extension in 22 knees, sometimes with an audible click. The patellofemoral joint was tender in 19 knees and there was an effusion in three knees.

**Arthroscopic findings.** At arthroscopy a lesion was seen on the articular surface of the medial femoral condyle in 12 knees at the point of abutment of the anterior edge of the medial meniscus with the femoral condyle in full extension, which gave rise to a ridge of articular cartilage that impinged upon the medial synovial shelf in approximately 30 degrees of flexion. This lesion has been called the impingement lesion (Dandy 1981). There were irregularities of the articular surface of the patella in eight knees and a lateral synovial shelf was present in eight knees.

**Results of operation**

Of the 55 knees in the 50 patients traced for review, the operation had relieved symptoms completely in 19 knees (34.5 per cent). Twenty-seven knees (49 per cent) gave rise to occasional discomfort only and were classified as good results. In three knees, the symptoms were unchanged by operation. The symptoms in six knees had continued to deteriorate; one of these knees later underwent a patellectomy at another hospital, and another later underwent an arthroscopic medial meniscectomy for a lesion that had been missed at the original arthroscopy (Table I).

The best results were found in 26 patients in whom the only abnormal physical sign was tenderness over the medial synovial shelf. Of this group, 16 had an excellent result and nine a good result. The remaining patient later required an arthroscopic medial meniscectomy and was classed as a poor result. Of 21 patients with localised tenderness plus some other abnormality in the knee, excellent results were obtained in three patients and good results in 18.

With the exception of the patient who underwent medial meniscectomy, all the fair or poor results occurred in patients who had retropatellar tenderness on clinical examination, irregularities of the patellar surface at arthroscopy or an impingement lesion.

**DISCUSSION**

The medial synovial shelf syndrome is the subject of some controversy because the very existence of the synovial shelf, which is easily apparent to arthroscopists, may be disputed by surgeons unfamiliar with the arthroscope. The precise clinical features of the medial synovial shelf syndrome have yet to be defined, but experience from this series and from other studies (Patel 1978; Glasgow et al. 1981) suggests that it is a cause of pain in the anterior aspect of the knee and must be distinguished from pain arising from the patellofemoral joint.

The clinical features associated with a good long-term result from excision of the synovial shelf still await exact definition, but the results of this study suggest that the best results are obtained in patients with pain and tenderness confined to the region of the medial synovial shelf alone, and without any clinical or arthroscopic evidence of damage to the articular surface of the patella or to the femoral condyle. If there is some additional abnormality in the knee, the result will be less satisfactory; and in patients with abnormalities of the patellofemoral joint, excision of the synovial shelf is unlikely to influence the natural history of the condition.

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**REFERENCES**


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