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## Synovial Plica

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### Key words:

**Key words:** Synovial plica, anterior knee pain, knee clicking, knee catching, knee locking, synovial folds, synovitis, arthroscopy, arthroscopic synovectomy

### Synovial plica

Synovial plica are folds of embryonic remnants of synovial membrane which, in the foetus, divide knee into three compartments. Plicae are a common cause of anterior knee pain associated with episodic clicking in the knee.

### Aetiology

The condition is caused by catching of the synovial folds within the knee during bending.

### Anatomy

The three embryological divisions of the knee usually resorb and disappear in the second third of pregnancy during foetal development. Remnants may be left as folds or ridges within the synovial lining of the knee. These folds are called synovial plicae. Plicae are present in up to 40% of Caucasian adults.

Plicae most commonly occur as folds across the anterior medial aspect of the knee. However they may be much more extensive, fibrous and thick. Plicae can also occur as a membrane of division across the supra-patellar part of the knee above the patella or in the front below the patella. Occasionally the knee cavity may be divided in two by a complete supra-patellar plicae.

The function of the plicae is debateable. They probably have no function. However the anterior plicae or ligamentum mucosae and the anterior alar folds may have a function in controlling the position of the retropatellar fat pad during knee flexion.

### Symptoms of Presentation

The symptoms of synovial plicae present in characteristic ways and at characteristic times. Most commonly adolescents present with painful clicking in the knee. This commonly has an onset associated with the start of formal sports training or later in childhood with more intensive sports training. Alternately specific activities such as "step aerobics" may precipitate the symptoms. The onset of symptoms is also related to motor vehicle accidents where the anterior aspect of the knee may impact on the dashboard causing symptoms to start.

The most common symptom is that of a painful episodic click in the anterior-medial aspect of the knee associated with sports or climbing hills and stairs. Additional symptoms may include catching, or even locking of the knee, giving way or just pain. This may even result in persistent locking of the knee misdiagnosed for many years. The symptoms are usually worse when climbing or descending stairs or hills, whilst jumping, running on hills, cycling with a low saddle or jumping. The condition is common in breaststroke swimmers and has also been termed “breaststroker’s knee”. Alternately the knee may just be sore and moderately painful. The condition is often associated with pain or discomfort when sitting for a considerable time whilst driving or in a cinema. However the condition is rarely associated with swelling or effusion within the knee joint or with pain at night.

Whilst anterior-medial plicae often cause clicking, catching and pain. Supra-patellar plicae are more commonly associated with a dragging sensation of tenderness around the lower part of the thigh above the patella. A cyst or lump may occasionally form in this area. Anterior plicae may present with an ache and tenderness around the anterior aspect of the knee behind the patellar tendon in the area known as the fat pad. Anterior plicae are seldom symptomatic but may present with the greatest diagnostic challenge.

The medial synovial plicae is the most common form of plica. The plicae is sited over the medial femoral condyle. The plicae in this position is vulnerable to direct trauma when the knee is flexed. This commonly occurs in motor vehicle accidents. Alternately repeated trauma, running on hills, cycling with a low saddle or repetitive jumping may irritate the plicae and lead to symptoms.

Radiographs are usually normal in symptomatic synovial plicae. MRI scans may detect supra-patellar membranes but are notoriously poor at demonstrating the more commonly symptomatic medial synovial plicae.

Clinical examination may be normal. However there is usually tenderness over the site of the plicae. Most commonly this is over the medial aspect of the medial patellar retinaculum, the medial aspect of the fat pad just above the joint margin. The symptoms and clinical signs may be confused with a torn medial meniscus. The palpation is often assisted by palpating the medial retinaculum whilst the knee is flexed and extended.

#### **Treatment modalities – non-operative**

Symptomatic synovial plicae are diagnosed when other similar conditions such as a torn medial meniscus have been excluded on the clinical history, signs or by MRI scan. The initial treatment of a patient usually involves a period of physiotherapy, analgesia and anti-inflammatory medication (NSAID). However if this proves unsuccessful and the patient remains symptomatic and restricted further management may be attempted.

A steroid injection into the extra-articular part of the patellar retinaculum may be appropriate. Although the improvement may be short lived, in some cases a significant permanent improvement results.

#### **Treatment modalities – operative**

Arthroscopic resection of the plicae has been shown by the author to be the most effective way of eradicating patients symptoms and allowing a return to function of the knee. When necessary in a group of long term complaining adolescents the technique was shown to be successful in eradicating the symptoms in 94% of cases. In 6% of cases the improvement proved temporary (Johnson et al 1986)

#### **Arthroscopic Treatment**

The surgical technique for the treatment of symptomatic synovial plica is by a knee arthroscopy and excision of the plica. This involves “key hole” surgery usually undertaken as a day case procedure under general anaesthetic. At arthroscopy the synovial folds are easily recognised and excised. Occasionally damage from catching or impingement of the medial plica on the edge of the medial femoral condyle may be associated with a small area of damage to the articular surface. This is not usually the cause of any symptoms once the plica is excised and removed. Patients can usually expect to return to office work and driving with two or three days and to sports after one to three weeks. After excision of a plica and the fat pad full knee flexion is often uncomfortable. Physiotherapy may assist in the rehabilitation and return to function and sports.

#### **Operative complications**

Arthroscopic excision of a symptomatic synovial plica is usually very safe with a very low level of surgical complications (less than 1%). There is not usually or commonly any associated or resulting long term problems having had a synovial plica or having undergone arthroscopic excision.

### Prognosis

Following non-operative treatment of physiotherapy, eccentric quadriceps exercises and anti-inflammatory medication 44% of patient may be improved after a year. Conversely Johnson reported a 94% improvement and return to full sporting activities following arthroscopic excision of the symptomatic synovial plica.

### Overview

Symptomatic synovial plica is a common condition and one of many which can present with anterior knee pain. The condition is commonly in children or young adults who present with painful episodic clicking in the knee whilst in sports, jumping or climbing stairs. If non-operative treatment fails then arthroscopy is usually very effective.

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### Further information:

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