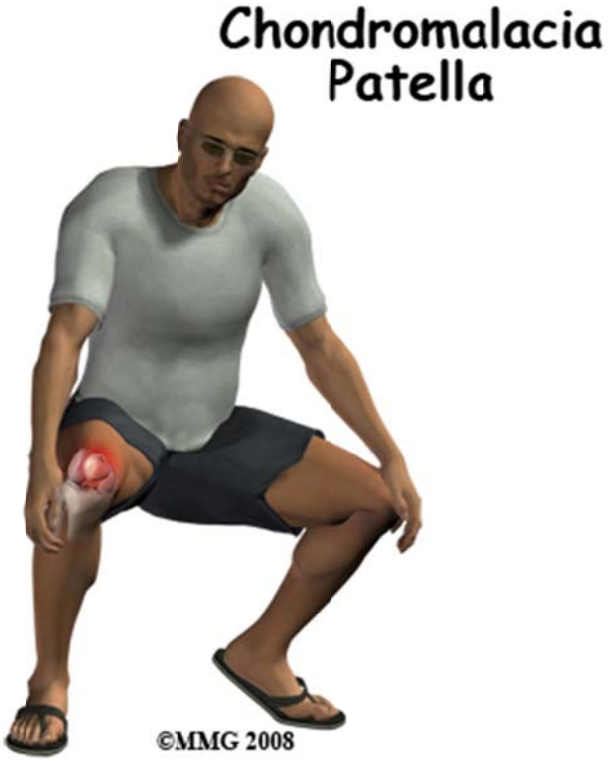
Chondromalacia Patella

Introduction



Welcome to BodyZone Physiotherapy's patient resource about Chondromalacia Patella.

The patella, or kneecap, can be a source of knee pain when it fails to function properly. Alignment or overuse pr
the patella can lead to wear and tear of the cartilage behind the patella. Chondromalacia patella is a common kne
that affects the patella and the groove it slides in over the femur (thigh bone). This action takes place at the patel
joint.

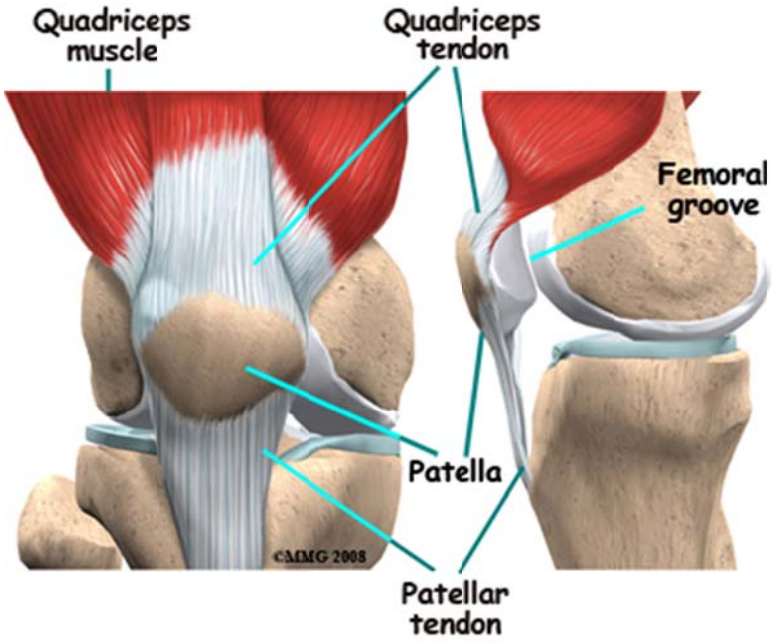
Chondromalacia is the term used to describe a patellofemoral joint that has been structurally damaged, while the patellofemoral pain syndrome(PFPS) refers to the earlier stages of the condition. Symptoms are more likely to be with PFPS.

This guide will help you understand:

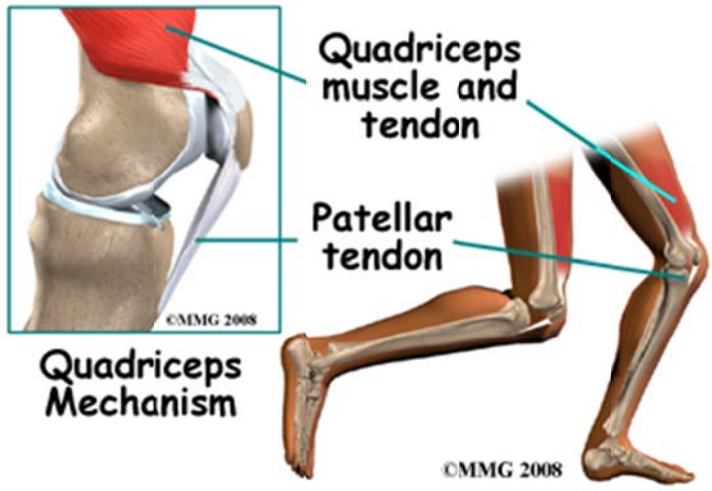
- what parts of the knee are affected
- how this condition develops
- how doctors diagnose the condition
- what treatment options are available

Anatomy

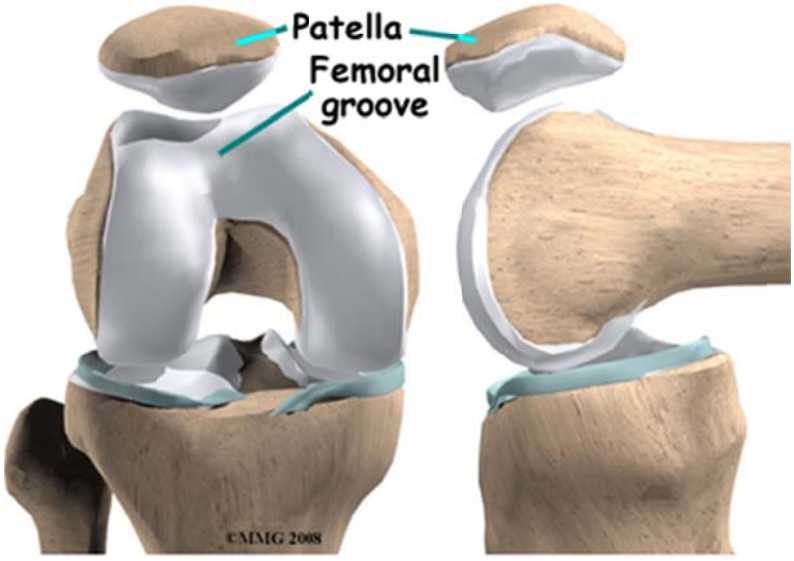
What is the patella, and what does it do?



The patella (kneecap) is the moveable bone on the front of the knee. This unique bone is wrapped inside a tendon connects the large muscles on the front of the thigh, the quadriceps muscles, to the lower leg bone. The large qua tendon together with the patella is called the quadriceps mechanism. Though we think of it as a single device, the mechanism has two separate tendons, the quadriceps tendon on top of the patella and the patellar tendon below t



Tightening up the quadriceps muscles places a pull on the tendons of the quadriceps mechanism. This action cau
to straighten. The patella acts like a fulcrum to increase the force of the quadriceps muscles.



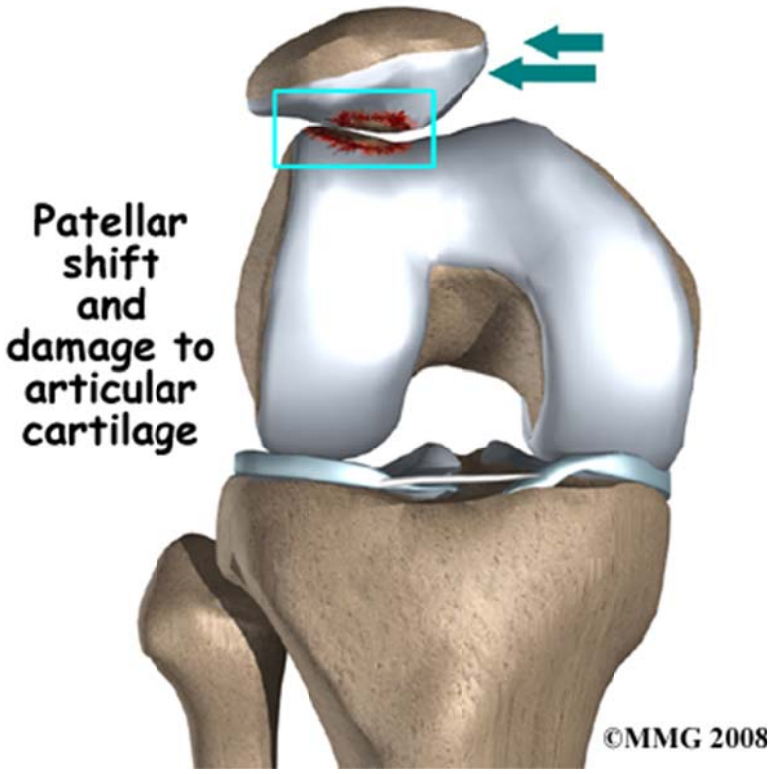
The underside of the patella is covered with articular cartilage, the smooth, slippery covering found on joint surfa
covering helps the patella glide (or track) in a special groove made by the thighbone, or femur. This groove is ca
femoral groove.

Two muscles of the thigh attach to the patella and help control its position in the femoral groove as the leg straig
muscles are the vastus medialis obliquus (VMO) and the vastus lateralis (VL). The vastus medialis obliquus (VM
along the inside of the thigh, and the vastus lateralis (VL) lies along the outside of the thigh. If the timing betwee
muscles is off, the patella may be pulled off track.

Causes

What causes this problem?

Problems commonly develop when the patella suffers wear and tear. The underlying cartilage begins to degenera
condition most common in young athletes. Soccer players, snowboarders, cyclists, rowers, tennis players, ballet
runners are affected most often. But anyone whose knees are under great stress is at increased risk of developing
chondromalacia patella.



Wear and tear can develop for several reasons. Acute injury to the patella or chronic friction between the patella
femur can result in the start of patellofemoral pain syndrome. Degeneration leading to chondromalacia may also
part of the aging process, like putting a lot of miles on a car.

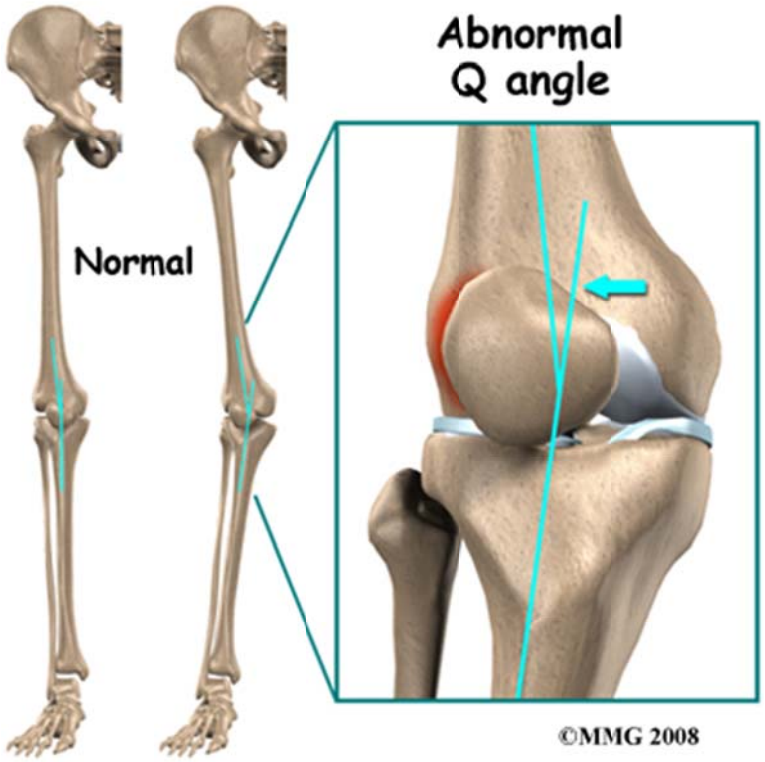
The main cause of knee pain associated with patellofemoral pain syndrome is a problem in the way the patella tr
the femoral groove as the knee moves. Physical and biomechanical changes alter the stress and load on the patell
joint.

The quadriceps muscle helps control the patella so it stays within this groove. If part of the quadriceps is weak f
reason, a muscle imbalance can occur. When this happens, the pull of the quadriceps muscle may cause the patel
more to one side than the other. This in turn causes more pressure on the articular cartilage on one side than the o
time, this pressure can damage the articular cartilage leading to chondromalacia patella.

Weakness of the muscles around the hip can also indirectly affect the patella and can lead to patellofemoral join
Weakness of the muscles that pull the hip out and away from the other leg, the hip abductor muscles, can lead to
to the alignment of the entire leg - including the knee joint and the muscle balance of the muscles around the kne
causes abnormal tracking of the patella within the femoral groove and eventually pain around the patella. Many p
confused when their physiotherapist begins exercises to strengthen and balance the hip muscles, but there is a ve
reason that the therapist is focusing on this area.

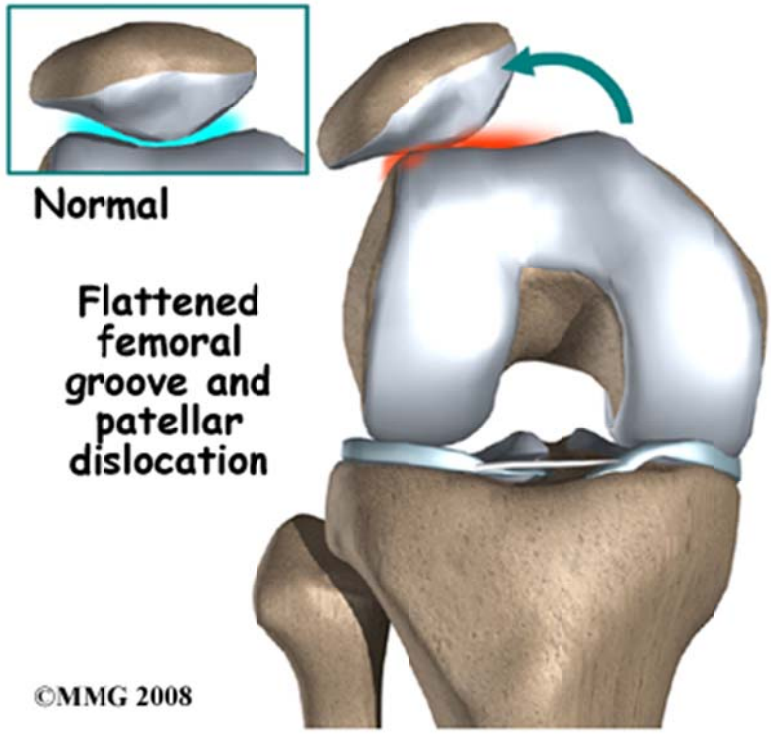
A similar problem can happen when the timing of the quadriceps muscles is off. There are four muscles that for
quadriceps muscle group. As mentioned earlier, the vastus medialis obliquus (the muscle on the inside of the fro
thigh) and the vastus lateralis (the muscle that runs down the outside part of the thigh) are two of these four mus

with patellofemoral problems sometimes have problems in the timing between the VMO and the VL. The VL co
before the VMO. This tends to pull the patella toward the outside edge of the knee. The result is abnormal pressu
articular surface of the patella.



Another type of imbalance may exist due to differences in how the bones of the knee are shaped. These differenc
anatomic variations, are something people are born with. Doctors refer to this the "Q angle". Some people are bo
greater than normal angle where the femur and the tibia (shinbone) come together at the knee joint. Women tend
greater angle here than men. The patella normally sits at the center of this angle within the femoral groove. Wher
quadriceps muscle contracts, the angle in the knee straightens, pushing the patella to the outside of the knee. In c
this angle is increased, the patella tends to shift outward with greater pressure. This leads to a similar problem as
described above. As the patella slides through the groove, it shifts to the outside. This places more pressure on or
the other, leading to damage to the underlying articular cartilage.

Problems at the foot level can also contribute to poor tracking of the patella. If the long arch of the foot is too fla
the foot will roll in during gait, a situation called over-pronation. This causes the tibia to rotate inwards causing
the angle of the femur and tibia and altering the pull of the muscles. This causes increased pressure and poor fun
alignment of the patella during walking or running similarly to increases in "Q" angle as described above.



Finally, anatomic variations in the bones of the knee can occur such that one side of the femoral groove is smalle
normal. This creates a situation where the groove is too shallow, usually on the outside part of the knee. People v
shallow groove sometimes have their patella slip sideways out of the groove, causing a patellar dislocation. This
painful when it occurs, but it can damage the articular cartilage underneath the patella. If this occurs repeatedly,
degeneration of the patellofemoral joint occurs fairly rapidly.

Symptoms

What does chondromalacia patella feel like?

The most common symptom is pain underneath or around the edges of the patella. The pain is made worse by an
that load the patellofemoral joint, such as running, squatting, or going up and down stairs. Kneeling is often too p
even try. Keeping the knee bent for long periods, as in sitting in a car or movie theater, may cause pain.

There may be a sensation like the patella is slipping. This is thought to be a reflex response to pain and not becau
any instability in the knee. Others experience vague pain in the knee that isn't centered in any one spot.

The knee may grind, or you may hear a crunching sound when you squat or go up and down stairs. If there is a c
amount of wear and tear, you may feel popping or clicking as you bend your knee. This can happen when the un
of the underside of the patella rubs against the femoral groove. The knee may swell with heavy use and become s
tight. This is usually because of fluid accumulating inside the knee joint, sometimes called 'water on the knee'. T

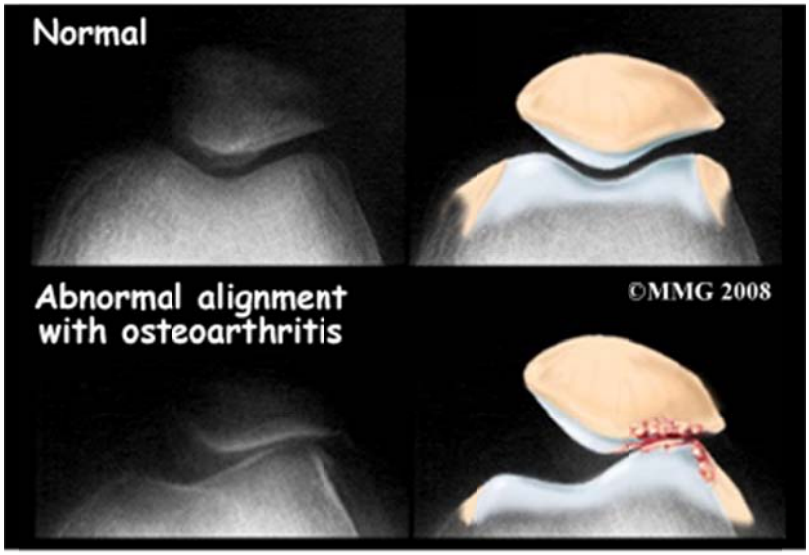
unique to problems of the patella but sometimes occurs when the knee becomes inflamed.

Diagnosis

How do health care providers diagnose the problem?

Diagnosis begins with a history and physical exam. Your BodyZone Physiotherapy physiotherapist will try to de
where the pain is located and if you have any grinding, clicks or pops with knee movement.

Some patients may be referred to a doctor for further diagnosis. Once your diagnostic examination is complete, t
physiotherapists at BodyZone Physiotherapy have treatment options that will help speed your recovery, so that y
more quickly return to your active lifestyle.



Chondromalacia
patella

Our Treatment

What treatment options are available?

Non-surgical Rehabilitation

Nonoperative treatment is usually recommended for this problem. Although the time required for recovery varies with chondromalacia often benefit from approximately four to six weeks of physiotherapy. The aim of treatment pain and inflammation, to correct muscle imbalances, and to improve function of the patella.

Getting the pain and inflammation under control is the first step. It is important for you to understand the need to activity level below what will trigger more pain and tissue damage. You may need to ice your knee during the da certain activities such as stairs, squatting, or running. The overall goals of BodyZone Physiotherapy rehabilitatio improve muscle function and flexibility while providing pain relief or pain control.

Our physiotherapist may suggest rest and anti-inflammatory medications, such as aspirin or ibuprofen, especially problem is coming from overuse. Acetaminophen (Tylenol®) may be used for pain control if you can't take anti- inflammatory medications for any reason. Our physiotherapist may also use ice massage and ultrasound to limit swelling.

Your physiotherapist will examine your standing leg alignment and watch how you walk, run, or climb stairs in determine which areas of the leg are weak or imbalanced. The goal will be to correct any muscle length, strength issues in order to prevent the condition from returning or worsening.

Activity modification, flexibility, and strengthening are key parts of our rehabilitation program. Good results can expected when working slowly but steadily on flexibility and strengthening exercises. The motto of no pain, no g not apply to this problem. The most successful program is one of common sense. If an activity causes pain, then frequency, intensity, or duration of that activity until you are once again pain free. We will help you to gradually what you can do while maintaining your pain free status.

Bracing or taping the patella can help you do exercises and activities with less pain. Most braces for patellofemo are made of soft fabric, such as cloth or neoprene. You slide them onto your knee like a sleeve. A small buttress side of the patella to keep it lined up within the groove of the femur.

An alternative to bracing is to tape the patella in place. Our physiotherapist applies and adjusts the tape over the realign the patella. The idea is that by bracing or taping the knee, the patella stays in better alignment within the groove. This in turn is thought to improve the pull of the quadriceps muscle so that the patella stays lined up in th Patients report less pain and improved function with these forms of treatment. Taping or bracing is usually temp used only until the muscles can effectively maintain optimal alignment of the patella again.

As the pain and inflammation become controlled, we will work with you to improve flexibility, strength, and mu in the knee. Muscle imbalances are commonly treated with stretching and strengthening exercises but improvem takes at least six to eight weeks. You may then need to continue a modified program of flexibility and strengthen exercises to maximize control and strength of the quadriceps muscles. This type of program is typically done two times each week, and, although the time required for recovery varies, you may need this type of physiotherapy fo

months (or longer if you continue to experience pain during progressive sports participation).

Quadriceps strengthening exercises that address deficits in knee extension strength include non-weight-bearing s
(e.g., knee extension) and weight-bearing multiple-joint exercises (e.g., seated leg press).

Non-weight bearing exercises are also known as open kinetic chain exercise. Weight-bearing exercises are refern
closed-chain exercise. Closed-chain exercises place less stress on the patellofemoral joint and may be used first t
improved function before progressing to open kinetic chain exercises. Studies also show greater VMO activity w
kinetic chain exercise. And a closed-chain exercise program also addresses hip muscle weakness at the same tim
muscle deficits.

Your physiotherapist at BodyZone Physiotherapy will adjust your rehab program to provide you with the most p
effective method of treatment. Your personalized program will also include exercises that you will do at home, s
stretching, agility exercises, balance activities, and strengthening designed to return you to your former level of p
participation in sports and other activities.

Post-surgical Rehabilitation

Many surgeons will have their patients take part in formal physiotherapy after knee surgery for patellofemoral pr
Patients undergoing a patellar shaving usually begin rehabilitation right away. More involved surgeries for patell
realignment or restorative procedures for the articular cartilage require a delay before going to therapy, and rehal
may be slower to allow the bone or cartilage to heal before too much strain can be put on the knee.

When you begin your post-surgical therapy program at Myo Sport Physiotherapy, the first few treatments are des
help control the pain and swelling from the surgery. Our physiotherapist will choose exercises to help improve k
and to get the quadriceps muscles toned and active again. Muscle stimulation, using electrodes over the quadrice
may be needed at first to get the muscle moving again.

As the program evolves, we will choose more challenging exercises to safely advance your knee's strength and fu
key is to get the soft tissues in balance through safe stretching and gradual strengthening.

Our goal is to help you keep your pain under control, ensure you place only a safe amount of weight on the heali
and improve your strength and range of motion. When your recovery is well under way, regular visits to BodyZo
Physiotherapy will end. Although our therapist will continue to be a resource, you will be in charge of doing you
as part of an ongoing home program.

Physician Review

Diagnosis begins with a complete history of your knee problem followed by an examination of the knee, includin
patella. X-rays may be ordered on the initial visit to your doctor. An X-ray can help determine if the patella is pr
aligned in the femoral groove. Several X-rays taken with the knee bent at several different angles can help deterr

patella seems to be moving through the femoral groove in the correct alignment. The X-ray may show arthritis b
patella and thighbone, especially when the problems have been there for awhile.

Diagnosing problems with the patella can be confusing. The symptoms can be easily confused with other knee p
because the symptoms are often similar. In these cases, other tests, such as magnetic resonance imaging (MRI), m
suggested. The MRI machine uses magnetic waves rather than X-rays to show the soft tissues of the body. This m
creates pictures that look like slices of the knee. Usually, this test is done to look for injuries, such as tears in the
ligaments of the knee. Recent advances in the quality of MRI scans have enabled doctors to see the articular cart
scan and determine if it is damaged. This test does not require any needles or special dye and is painless.

In some cases, arthroscopy may be used to make the definitive diagnosis when there is still a question about wha
your knee problem. Arthroscopy is an operation that involves placing a small fiber-optic TV camera into the kne
allowing the surgeon to look at the structures inside the joint directly. The arthroscope allows your doctor to see
condition of the articular cartilage on the back of your patella. The vast majority of patellofemoral problems are
without resorting to surgery, and arthroscopy is usually reserved to treat the problems identified by other means.

There is no clear link between the severity of symptoms and X-ray or arthroscopic findings. Most often, the doct
upon the history, symptoms, and results of the examination.

Surgery

If nonsurgical treatment fails to improve your condition, surgery may be suggested. The procedure used for patel
problems varies. In severe cases a combination of one or more of the following procedures may be necessary.

Arthroscopic Method

Arthroscopy is sometimes useful in the treatment of patellofemoral problems of the knee. Looking directly at the
cartilage surfaces of the patella and the femoral groove is the most accurate way of determining how much wear
there is in these areas. Your surgeon can also watch as the patella moves through the groove, and may be able to
whether or not the patella is moving normally. If there are areas of articular cartilage damage behind the patella t
creating a rough surface, special tools can be used by the surgeon to smooth the surface and reduce your pain. Th
procedure is sometimes referred to as shaving the patella.

Cartilage Procedure

In more advanced cases of patellar arthritis, surgeons may operate to repair or restore the damaged cartilage. The
surgery needed for articular cartilage is based on the size, type, and location of the damage. Along with surgical
fix the cartilage, other procedures may also be done to help align the patella so less pressure is placed on the heal
cartilage.

Lateral Release

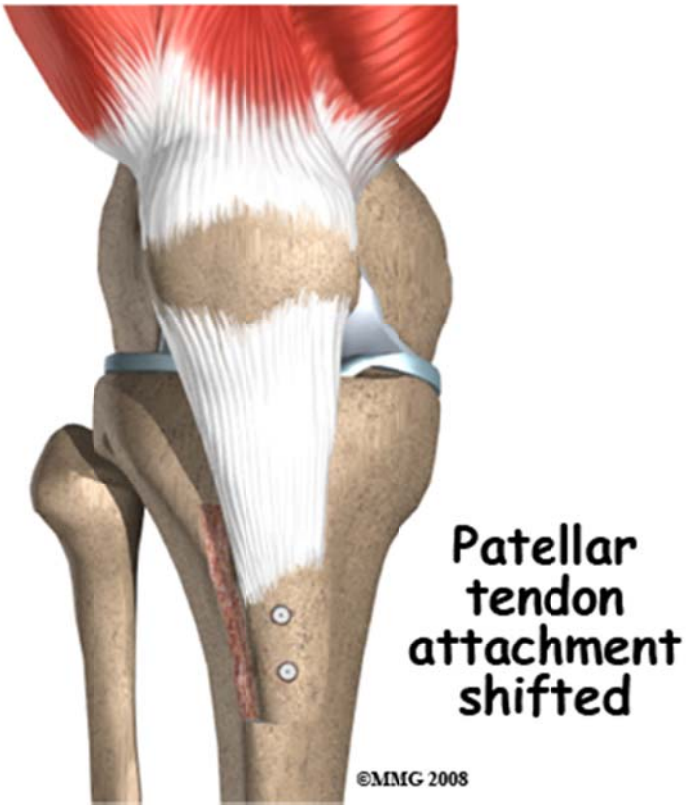
If your patella problems appear to be caused by a misalignment problem, a procedure called a lateral release may suggested. This procedure is done to allow the patella to shift back to a more normal position and relieve pressur articular cartilage.

In this operation, the tight ligaments on the outside (lateral side) of the patella are cut, or released, to allow the pa slide more towards the center of the femoral groove. These ligaments eventually heal with scar tissue that fills in created by the surgery, but they no longer pull the patella to the outside as strongly as before the surgery. This he balance the quadriceps mechanism and equalize the pressure on the articular cartilage behind the patella.

Ligament Tightening Procedure

In some cases of severe patellar misalignment, a lateral release alone may not be enough. For problems of repeat dislocations, the surgeon may also need to realign the quadriceps mechanism. In addition to the lateral release, th on the inside edge of the knee (the medial side) may have to be tightened as well.

Bony Realignment



If the misalignment is severe, the bony attachment of the patellar tendon may also have to be shifted to a new spo
tibia bone. Remember that the patellar tendon attaches the patella to the lower leg bone (tibia) just below the kne
moving a section of bone where the patellar tendon attaches to the tibia, surgeons can change the way the tendon
patella through the femoral groove.

The surgeon removes a section of bone where the patellar tendon attaches on the tibia. This section of bone is the
reattached on the tibia closer to the other knee.

Usually, the bone is reattached onto the tibia using screws. This procedure shifts the patella to the medial side. O
surgery heals, the patella should track better within the center of the groove, spreading the pressure equally on th
cartilage behind the patella.

Arthroscopic procedures to shave the patella or a simple lateral release can usually be done on an outpatient basi
you can leave the hospital the same day. If your problem requires the more involved surgical procedure where bo
cut to allow moving the patellar tendon attachment, you may need to spend one or two nights in the hospital.