

CHONDROMALACIA PATELLAE

Chondromalacia patellae (CMP) also known as runner's knee or anterior knee pain, is a condition where the cartilage on the undersurface of the patella deteriorates and softens. This condition is common among young athletic individuals but may also occur in older adults who have arthritis of the knee.

CAUSES:

Chondromalacia patella is usually described as an overload injury caused by malalignment of the femur to the patella and the tibia.

Main reasons for patellar malalignment;

- **Q-angle:** An abnormality of the Q-angle is one of the most significant factors of patellar malalignment. A normal Q-angle is 14° for men and 17° for women. An increase can result in an increased lateral pull on the patella.
- **Tightness** of muscles like, Rectus femoris, Tensor Fascia late, Hamstrings and Gastrocnemius.
- **Excessive pronation:** Prolonged pronation of the subtalar joint is caused by internal rotation of the leg. This internal rotation will result in malalignment of the patella.
- **Patella alta:** This is a condition where the patella is positioned in an abnormally superior position.
- **Vastus medialis insufficiency:** A muscular balance between the VL and VM is important. If the strength of VM is insufficient this will cause a lateral drift of the patella.

Degenerative changes of the articular cartilage can be caused by:

- **Trauma:** Instability caused by previous trauma or overuse during recovery
- Repetitive micro-trauma and inflammatory conditions

SYMPTOMS:

- Pain in the knee region known as patellofemoral pain.
- Grinding or cracking when bending or extending the knee.
- Pain after sitting for a prolonged period of time or during activities that apply extreme pressure on the knees such as standing for an extended period or exercising.

STAGES OR GRADING OF CMP: There are four grades. Grade 1 is least severe while grade 4 indicates the greatest severity.

Grade 1 severity indicates softening of the cartilage in the knee area.

Grade 2 indicates a softening of the cartilage along with abnormal surface characteristics. This usually marks the beginning of tissue erosion.

Grade 3 shows thinning of cartilage with active deterioration of the tissue.

Grade 4 the most severe grade, indicates exposure of the bone with a significant portion of cartilage deteriorated. Bone exposure means bone-to-bone rubbing is likely occurring in the knee.

DIAGNOSIS: It includes the following;

EXAMINATION:

- **Observation:** Joint appearance is usually normal but there may be a slight effusion.
- **Movement:** Passive movements are usually full and painless but repeated extension of the knee from flexion will produce pain and a grating feeling underneath the patella, especially if the articular surfaces are compressed together.
- **Palpation:** Pain and crepitus will be felt when patella is compressed against the femur with the knee in full extension. Tenderness of one or other margin may be elicited and more frequently felt medially. Static quadriceps contraction against resistance will generally produce a sharp pain under the patella.

Knee X-ray - These may help to rule out some types of arthritis or inflammation.

MRI scan - Shows details of the knee joint and can show up many cases of chondromalacia.

Arthroscopy - A tiny flexible camera is inserted into the knee to see exactly what the cartilage looks like.

Specific test:

Patellar grind test or Clarke's sign:

Patient is positioned in supine or long sitting with the involved knee extended. The examiner places the web space of his hand just superior to the patella while applying pressure. The patient is instructed to gently and gradually contract the quadriceps muscle. A positive sign on this test is pain in the patellofemoral joint.

TREATMENT:

Conservative treatment:

- Initially the knee is immobilized in POP cylinder cast. The exercise plan then includes:
- Gentle isometric quadriceps contraction.
- Assisted SLR
- Strong hip, ankle and foot movement.
- Ambulation with shoe raise on the normal side, so as to facilitate movement of affected leg encased in POP cast.

When treated without a POP cast:

- Isometric quadriceps with the knee in slight flexion to avoid patellar movement within the pain limit.
- Avoid strenuous activity.

- Assisted SLR without hyperextension of the knee.
- Relaxed passive or active swinging movement to maintain the ROM.
- Controlled ambulation to avoid hyperextension of the knee.
- As pain reduced PRE should be started and functional activities should be encouraged except squatting.
- Thermotherapy like pulsed SWD or therapeutic Ultrasound can be given.

Taping of the patella: Adhesive tape is applied over the patella to alter the alignment or the way the patella moves. It helps to reduce the pain.

Surgical treatment:

It is indicated only when the conservative treatment fails. It includes:

Arthrotomy: This is also known as chondrectomy or shaving. The affected area of articular cartilage is removed by shaving and smoothing. This procedure is effective in very early cases of chondromalacia patellae.

Patellectomy: It is indicated when fragmentation and fissuring affects an area of more than 1.3cm in diameter or erosion of the articular cartilage and subchondral bone occurs.

Post-op physiotherapy:

0-4 WEEKS:

Therapeutic exercises:

- Passive ROM exercises for lower extremity.
- Isometric exercises of Quadriceps, Hamstrings, Calf and Gluteal muscles.
- Ankle pumps
- Isometric hip adduction
- Calf stretch

Weight bearing:

- NWB with crutches or walker with brace or knee immobilizer thrice per week.

4-8 WEEKS:

Therapeutic Exercises:

- Initiate SLR
- Initiate multi-angle knee isometrics
- Heel slides, supine wall slides or sitting knee flexion
- Continue ROM within limits of brace Initiate aquatics if available and wound is healed

Weight Bearing:

- Progress to 20% WB with appropriate assistive device two to three times per week.

8-12 WEEKS:

Therapeutic Exercises:

- Initiate gentle AROM
- Initiate PRE's
- Initiate stationary bicycle
- Continue aquatics if available

Weight Bearing:

- Progress to FWB with crutches or walker

References:

<https://www.universityorthopaedic.com/rehab-protocols.aspx>

<https://www.healthline.com/health/chondromalacia-patella>

https://www.physio-pedia.com/Chondromalacia_Patellae