Chondromalacia

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What is Chondromalacia?

Chondromalacia, also known as “runner’s knee,” is a condition where the cartilage on the undersurface of the patella (knee cap) deteriorates and softens. This condition is common among young, athletic individuals, but may also occur in older adults who have arthritis of the knee.

It is often seen as an overuse injury in sports like running, and is sometimes treated by taking a few days off from training. In other cases, it is caused by improper knee alignment and resting does not provide relief. Although runner’s knee is characterized by knee pain and grinding sensations, many people who have it never seek medical treatment.

What Causes Chondromalacia?

Your kneecap is normally positioned over the joint of your knee. When you bend your knee, the movement causes the backside of your kneecap to glide over the bones of the knee, specifically the femur or thigh bone. Tendons and ligaments attach your kneecap to your shinbone and your thigh muscle to the kneecap. When any of these components fails to move properly, it can cause your kneecap to rub up against your bone, leading to deterioration in the patella—i.e., chondromalacia or runner’s knee.

Improper kneecap movement may result from:

- poor alignment due to a congenital condition
- weak hamstrings and quadriceps (the muscles in the back and front of your thighs)
- muscle imbalance between the adductors and abductors (the muscles on the outside and inside of your thighs)
- repeated stress to your knee joints, such as from running, skiing, or jumping
- a direct blow or trauma to your kneecap

Who is at Risk for Chondromalacia?

Risk factors for developing runner’s knee include:

Age

Adolescents and young adults are at high risk for this condition. During growth spurts, the muscles and bones are developing rapidly, which may contribute to short-term muscle imbalances.

Sex

Females are more likely than males to develop runner's knee as they typically possess less muscle mass than males. This can cause abnormal knee positioning, as well as more lateral (side) pressure on the kneecap.

Flat Feet

Flat feet may place more stress on your knee joints than in people who have higher arches in their feet.

Previous Injury

A prior injury to the kneecap, such as a dislocation, can increase your risk of developing runner's knee.

High-Activity Level

If you have a high-activity level or engage in frequent exercises that place pressure on your knee joints, this can increase the risk for knee problems.

Arthritis

Runner's knee can also be a symptom of arthritis, a condition causing inflammation to the joint and tissue. Inflammation can prevent the kneecap from functioning properly.

What Are the Symptoms of Chondromalacia?

Chondromalacia will typically present itself with pain in the knee region, known as patellofemoral pain. You may feel sensations of grinding or cracking when bending or extending your knee. Pain may worsen after sitting for a prolonged period of time or during activities that apply extreme pressure to your knees, like standing for an extended period or exercising.

Diagnosing and Grading Severity of Chondromalacia

Diagnosis

Your doctor will examine your knee looking for areas of swelling or tenderness. Additionally, he or she may look at how your kneecap aligns with your thighbone. A misalignment can be an indicator of chondromalacia. Your doctor may also apply resistive pressure to your extended kneecap to determine the tenderness and severity.

Afterward, your doctor may request any of the following tests to aid in diagnosis and grading:

- X-rays to show bone damage or signs of misalignment or arthritis
- magnetic resonance imaging (MRI) to view cartilage wear and tear
- arthroscopic exam, a minimally invasive procedure involving use of an endoscope and camera inserted into the knee joint.

Grading

There are four grades, ranging from Grade I to IV, that designate the severity of runner's knee. Grade I is least severe, while Grade IV indicates the greatest severity.

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

Grade II designates a softening of the cartilage along with abnormal surface

characteristics. This usually indicates the beginning of tissue erosion.

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

Grade IV, 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.

Treatment Options for Chondromalacia

The goal of treatment is to reduce the pressure on your kneecap and joint. Resting, stabilizing, and icing the joint may be the first line of treatment. The cartilage damage resulting in runner's knee can often repair itself with rest.

Your physician may prescribe several weeks of **anti-inflammatory medication** (like ibuprofen) to reduce inflammation around the joint. If swelling, tenderness, and pain persist, the following treatment options may be explored:

Physical Therapy

Physical therapy focusing on strengthening the quadriceps, hamstrings, adductors, and abductors can help improve your muscle strength and balance. Muscle balance will help prevent knee misalignment.

Non-weight bearing exercises are typically recommended, such as swimming or riding a stationary bike. Additionally, isometric exercises that involve tightening and releasing your muscles can be used to maintain muscle mass.

Surgery

Arthroscopic surgery may be needed to examine the joint and determine whether there is misalignment of the knee. This surgery involves inserting a camera into your joint through a tiny incision. A surgical procedure may be used to fix the problem. One common procedure is called a lateral release. This operation involves cutting some of your ligaments to release tension and allow for more movement.

Other surgical options may involve smoothing the backside of the kneecap, implanting a cartilage graft, or relocating the insertion of the thigh muscle.

Tips to Prevent Chondromalacia

You can help reduce your risk of developing "runner's knee" by following these recommendations.

- Avoid repeated stress to your kneecaps. Wear kneepads if you have to spend time on your knees.
- Create muscle balance by strengthening your quadriceps and hamstrings, as well as your abductors and adductors.
- Wear shoe inserts that correct flat feet by increasing your arch. This will decrease the amount of pressure placed on your knees and may realign the kneecap.

Finally, excess body weight may stress your knees. Maintaining a healthy body weight can help take undue pressure off of knees and other joints. You can take steps to lose weight by:

- exercising at least 30 minutes three times a week
- reducing your sugar and fat intake
- eating plenty of vegetables, fruits, and whole grains

Article Sources:

- Bhave, A. & Baker, E. (2008). Prescribing quality patellofemoral rehabilitation before advocating operative care. *Orthopedic Clinics of North America, 39,* 275-285. Retrieved June 26, 2012, from http://www.med.nyu.edu/pmr/residency/resources/general%20MSK%20and%20Pain/Clinics%20Ortho_pat%20fem%20rehab%20before%20surgery.pdf
- Chondromalacia of the Patella. (2010, June 13). Wake Forest Baptist Health. Retrieved June 11, 2012, from http://www.wakehealth.edu/HealthEncyclopedia/ADAMImage.aspx?id=14102
- Chondromalacia. (n.d.). Cedars-Sinai. Retrieved June 11, 2012, from http://www.cedars-sinai.edu/Patients/Health-Conditions/Chondromalacia.aspx