Dynamic Chiropractic

SOFT TISSUE / TRIGGER POINTS

Tidbits on the Knee

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Tidbit is defined as "a delicate bit or choice morsel of food or news."[1] I would like to elucidate some choice morsels about the knee that might be of use regarding evaluation and treatment.

Exercising the Quadriceps

Strengthening of the *vastus medialis obliquus* (VMO) has been shown to be very important in maintaining the balance of the patella against the usually stronger fibrous lateral patella stabilizers. Quadriceps exercises emphasizing the VMO have been recommended, but at present, the literature does not support the existence of isolated VMO exercises.[2] Atrophy of the VMO should be looked at as weakness of the whole quadriceps. If a patellofemoral articular problem exists, leg press exercises, where-by the patient sits and pushes his or her feet against a weight, are considered the most desirable in the early range of motion from 0 degrees (knee extension) to 30 degrees knee flexion.[3]

Leg terminal-extension exercises, such as quadriceps setting (roll under the knee with patient sitting), provide increased activity of the VMO and VL without putting much pressure on the patellofemoral joint.

Closed-chain exercises (foot on the ground): With the patient standing, feet facing forward, positioned at the width of the pelvis, squeeze the gluteals and slowly flex the knees to 30 degrees and return to full extension without locking the knees.[4] It is an excellent beginning exercise. Of course, all exercises should be tailored to the specific sport or activities of the individual.

Effect of Tight Muscles on Patellofemoral Pain

If the hamstrings are tight, a relative knee flexion occurs, which requires the quadriceps to work harder to extend the knee. Increased quadriceps force increases pressure on the patellofemoral joint. If there is a tight iliopsoas causing a hip flexion contracture, hip extension will be diminished during the stance phase of gait, resulting in compensatory knee flexion to keep the foot underneath the center of gravity.

Increased knee flexion results in increased pressure on the patella. If the gastrocnemius muscle is short (decreased ankle dorsiflexion with the knee extended) during gait, the subtalar joint will increase its pronation, resulting in increased tibial internal rotation. With excessive pronation, the tibial internal rotation leads to excess femoral internal rotation, forcing the lateral portion of the trochlear anteromedially against the lateral patellar facet,[5] resulting in lateral knee pain.

Location of Most Free Nerve Endings (FNEs) in the Knee

The tendon of the quadriceps muscle (inserts into the superior patella pole) has the highest density, while the retinacular and patellar tendon has the second-highest density of FNEs. These pain-sensitive nerves also have a high proprioceptive capability for coordinating acceleration,

deceleration and rotation of the knee joint, and are important in balancing the patella while it glides over the trochlear.[6]

We Should Be Evaluating and Treating the Retinacular

The medial and lateral retinacular, along with the patellar tendon and quadriceps tendon, are the principle passive soft-tissue stabilizers of the patella. The retinacular insert into the patella. The lateral retinacular is especially influenced by its origin from the deep portion of the iliotibial band. When the iliotibial band is shortened, it will definitely influence the lateral retinacular, since on knee flexion, the lateral retinacular bands are drawn posteriorly, along with the iliotibial band, resulting in lateral tilting of the patella. This stretches the medial stabilizers, and if this situation is allowed to exist, the lateral tilt and displacement of the patella may lead to subluxation, excessive tilt, dislocation or excessive lateral pressure syndrome.[7]

Patients with chronic anterior knee pain have shown small nerve injury in the lateral retinaculum, due to the adaptive retinacular shortening. It is thought that the nerve injury may be due to a relative ischemia from the connective tissue hardening.[7] With the knee in extension, the patella is free, since it is not articulating with the trochlear. It is possible to determine if the lateral retinacular is shortened by tilting the medial side of the patella. The lateral side should reach a neutral position. With the patient supine and the knee extended, have him or her contract the quadriceps. Normally, there should be a proximal and slightly lateral movement of the patella. Excessive lateral patella motion may also indicate a shortened lateral retinaculum. Compare with the opposite side. Palpation of the areas of involved retinaculum will be tender, and deep friction massage or instrumented-assisted soft- tissue mobilization will help the problem.

Chondromalacia Not Usually the Source of Anterior Knee Pain

It is normal for the patellar cartilage to degenerate with age, and there is a poor association of knee pain with softened articular cartilage.[8] More importantly, there are no nerve fibers in articular cartilage. Look to the retinaculum as a major source of anterior knee pain.

The Q Angle

For years, everyone has been measuring the Q angle (the line of pull of the quadriceps and the patellar tendon). So far, no studies have shown a direct correlation with an increased Q angle and patel-lofemoral pain.[7]

References

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