

Knee Stiffness in a Young Athlete After Activity

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A mother brings her 12-year-old to your office that may or may not be involved in organized sports, with the complaint of knee stiffness. This occurs only after activity, and then disappears. The coach or parent may have noticed a slight limp (after the activity) that didn't last very long. These may be the only symptoms, and physical examination and x-rays may be negative. Beware, especially of juvenile osteochondritis dissecans (JOCD). Symptoms may be vague with nonlocalized pain (as mentioned above) and difficult to diagnose, or may be "low-grade pain, crepitus, decreased range of motion, joint line tenderness, and recurrent knee effusions with no obvious mechanical symptoms."¹ Anytime there is any effusion after exercise in a young athlete, it must be considered serious. The ankle and elbow are other common areas.

The pathology of JOCD in the knee is located in the subchondral bone of the femoral condyle. A principal cause is the cumulative process of microtrauma over months or years, resulting in stress fractures of the subchondral bone. JOCD has escalated over the past 40 to 50 years, a result of the explosive growth of intensive, year-round sports for children of both sexes.² JOCD can also develop after a macrotrauma, due to patella dislocation or anterior cruciate ligament injury. In the traumatic event, the anterior tibial spine abuts the medial femoral condyle, or there is shearing, which is more commonly found in the lateral joint compartment of the knee.³ In an osteochondral injury, there is a separation of a segment of articular cartilage along with its underlying bone. If the condition is allowed to continue, the lesion usually will detach, but if JOCD is diagnosed early, conservative treatment can often result in healing that prevents future degenerative arthritis.

Radiographs may show the "lateral notch sign," which is a deepened lateral femoral notch. Wilson's sign may be helpful: extending a 90° flexed knee with the tibia in internal rotation could create pain at around 30° of flexion, while external rotation with extension will usually relieve the pain. The position of external rotation avoids impingement pain, caused by pressure of the tibial eminence on the lateral aspect of the medial femoral condyle. The child may be found to walk, with the tibia externally rotated for relief. There may be tenderness at the site of the effusion. Sometimes a defect is palpable on the femoral condyle with the knee flexed. There may be a decrease in range of motion with quadriceps atrophy. Crepitus can be retropatellar or at the medial or lateral joint line.³ If radiographs are negative, it is necessary to obtain scintigrams. If a JOCD lesion is not healed by the time of distal femoral physis closure, the lesion will progress to adult osteochondritis dissecans. According to Cahill and Ahten: "Unless there are signs of detachment of the fragment, or the patient is within eight months of physis closure, all JOCD patients should be placed on conservative treatment."

Probably one of the most difficult problems in dealing with the conservative treatment of JOCD in an active youth is creating compliance with the youth and the parents. Conservative treatment could last a year or more, with the total elimination of competitive sports. Usually, the child is relieved by rest, and considers the problem as minor, and although no longer competing in organized sports, goes out and shoots a few baskets to stay in shape. No reaggravation is allowed. The continuation of mild, periodic symptoms can be devastating regarding the future of the

condition. If there is pain with ambulation, patients are placed on crutches with weightbearing as tolerated, lasting 6-8 weeks. Casts and braces are not recommended, since they will limit range of motion and cause further deterioration of the femoral condylar articular surface.²

Indications for surgery are: detachment of the fragment; increasing or unremitting symptoms; persistently elevated bone scans; and the nearing of epiphyseal closure.² It is necessary that the lesion be healed before the time of distal femoral physis closure. The success of conservative treatment depends mainly on the presence of adequate subchondral bone attached to the articular fragment, since if no subchondral bone is attached to the fragment, there is no chance for the articular cartilage lesion to heal. The penetration of subchondral bone initiates an inflammatory healing cascade, since the subchondral bone has an adequate vascular supply. Patient compliance is extremely important, since conservative treatment has been unsuccessful in 50 percent of patients, and surgery is not always positive.² Rehabilitation of the muscles associated with the knee, especially the quadriceps and soft tissue methods to remove all adhesions and fibrotic areas, is important. Recently, it has been found that use of the Graston technique has been very effective for removing deep adhesions and soft tissue restrictions around the joints.⁴

References

1. Cain EL, Clancy WG. Treatment algorithm for osteochondral injuries of the knee. *Clinics in Sports Medicine*, 20(2), 2001:321-342.
2. Cahill BR, Ahten SM. The three critical components in the conservative treatment of juvenile osteochondritis dissecans (JOCD). *Clinics in Sports Med*. 20(2), 2001:287-298.
3. Birk GT, DeLee JC. Osteochondral injuries. *Clin. Sports Med*, 20(2), 2001:279-286.
4. Carey T. *The Graston Technique*. Therapy Care Resources, Indianapolis, Indiana (317-926-2996).

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