



POSNA

The Core Curriculum

Knee ligament injuries

Objectives

1. Discuss the incidence of knee ligament injuries in children
2. Discuss the natural history of anterior and posterior ligament injury in the child
3. Discuss the physical exam and imaging of children and adolescents with knee injury
4. Discuss treatment options and preferred treatment of the skeletally immature patient with an anterior cruciate injury
5. Describe treatment of an isolated medial collateral sprain in a skeletally immature patient

Discussion

Although knee ligament injuries in children were thought almost to be a curiosity only a generation ago, it is presently acknowledged that they occur frequently. A study of acute hemarthrosis in children by Stanitski revealed ACL injuries in 47% of boys 7-12, and 65% of those 13 and over. The natural history of ACL injuries in children is also clarifying, and it is simply not good. There is little question at present regarding whether or not operative reconstruction is necessary, the question is technique which will not interfere with subsequent growth. Many ACL injuries in skeletally immature patients occur at the tibial insertion. Natural history of isolated posterior cruciate injuries in athletes is more favorable; a substantial series of untreated posterior cruciate injuries in children has not yet been reported.

Diagnostic maneuvers are the same as those for the adult, as patterns of instability of the skeletally immature tend to resemble those of the adult. The straight instabilities are outnumbered by the rotary and combined instabilities. Palpation for tenderness over the collateral ligaments is helpful, the cruciates obviously are inaccessible. Stress testing of the collaterals is done in complete extension and 30 degrees of flexion. The anterior cruciate is tested by the anterior drawer, Lachman, and pivot shift tests. The Lachman test appears most sensitive, meniscal pathology can alter the pivot shift. The posterior drawer and quadriceps contraction test assess posterior cruciate integrity. MR imaging of the knee is reasonably reliable in skeletally immature patients; however, O'Shea believes examination and plain radiography are sufficient in the vast majority of patients to decide arthroscopy is indicated without MR imaging.

Reconstruction of anterior cruciate instability is by means of intra-articular or extra-articular repair. Long-term evaluation of extra-articular reconstructions has been unfavorable. To avoid violating the physis, most attempts at anterior cruciate reconstruction in the skeletally immature patient have used the "over the top" method, but this is biomechanically suboptimal. Presently, there is increased emphasis on transphyseal reconstruction using ligament or tendon. Growth disturbance after ACL reconstruction in a skeletally immature patient has been reported. The questions

remaining at the present time are 1) can a transphyseal reconstruction reliably allow further growth, and 2) how does one balance the gravity of an untreated ACL injury in the skeletally immature patient against the risk of possible physeal injury? Both questions are being actively investigated at the present time.

Isolated medial collateral ligament injuries can be nicely managed nonoperatively with protective bracing.

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