Dynamic Chiropractic

Figure 1. AP pelvis view of a patient

PEDIATRICS

Slipped Capital Femoral Epiphysis

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When children or adolescents present to the chiropractic office with pain at the hip, thigh or knee, there are only a handful of common conditions to consider. More specifically, if there is a painful limp originating at the hip, the list of conditions trickles down to even fewer. The main conditions to consider would be developmental hip dysplasia, Legg-Calvé-Perthes disease and slipped capital femoral epiphysis (SCFE).[1] This discussion will focus on SCFE.

Etiology

Figure 1. AP pelvis view of a patient presenting with left hip pain and a limp. Note the posterior, inferior and medial translation of the left femoral epiphysis.

SCFE is a relatively common hip disorder in adolescents, with an incidence of approximately 10 per 100,000 in the United States.[2] Although its cause is not understood, biomechanical factors play a primary role. Variables that could impact the biomechanics in the adolescent hip include obesity, physeal orientation, abnormalities in physeal architecture, and hormonal changes during adolescence affecting physeal strength.[1] The stresses at the hip that are most likely to produce a sheering force at the growth plate are abduction and external rotation.[3] These biomechanical factors lead to slippage of the epiphysis inferiorly and posteriorly in the direction of the weight-bearing force.[2,3]

Patient Presentation

Figure 2. Bilateral Klein's line: The line is used on an AP spot hip or AP pelvis study. It is drawn along the lateral aspect of the femoral neck. A portion of the femoral epiphysis/head should be present lateral to the line, as seen on the right.

The greatest association SCFE has is with obesity (defined as above the 95th percentile of weight for age). It is an unusual presentation in thin children.[1,3,4] SCFE is most frequently seen in children between the ages of 8 and 17, with the average age of onset being 11 or 12 in girls and 13 or 14 in boys.[3,4] There is a female-to-male ratio of occurrence that is approximately 1-to-1.5, but it can vary.[1,3] In addition, there is a slight increase of occurrence in African-American and Polynesian children.[1,3,4] In females, it is almost never seen after the onset of menses and will affect both hips equally.[1] In males, however, the left hip is affected twice as frequently as the right.[3]

The patient can present with or without a limp, but generally there will be significant pain if they can walk. Some will present with extreme pain that prevents them from walking at all. The hip and groin is the most frequent region of pain; however, the thigh and knee can be common areas of

referral.[1,3,4]

Radiographic Findings

Figure 3. Normal Klein's line: The line is drawn along the lateral aspect of the femoral neck and transects a portion of the femoral epiphysis/head (white arrow).

Plain-film radiographs are the most appropriate imaging to confirm the presence of SCFE. An AP pelvis view (Figure 1) and bilateral frog-leg views to compare both sides is most appropriate.[4] The key radiographic finding is posterior, inferior and medial displacement of the femoral epiphysis, which can be subtle on the AP view, but more obvious to the frog leg. Because this finding is subtle on the AP view, the use of Klein's line (Figures 2 - 4) can be of great assistance. Once the slip has been identified on radiographs, the diagnosis has been made.

Treatment

Early diagnosis is the key to avoiding both short- and long-term complications. Short-term

complications consist of avascular necrosis, chondrolysis and the need for a more complicated surgical procedure.[1,3,5] Long-term complications include the following: severe varus deformity, leg shortening, reduced range of motion, degenerative joint disease and pain.[1,3,5]

Figure 4. Abnormal Klein's line: The line is drawn along the lateral aspect of the femoral neck and should transect a portion of the femoral epiphysis. In this case, it does not, indicating a slipped capital femoral epiphysis. Note the posterior, inferior and medial translation of the femoral epiphysis.

The Kocher, et al., study, which reviewed 196 cases of SCFE, evaluated the time from onset of

symptoms to the time of diagnosis. They found that the median delay in diagnosis was eight weeks[5] and a direct correlation with delay in diagnosis and degree of slippage. There was also a correlation with the degree of slippage and pain that radiated to the thigh and knee. More significant slippage revealed a pain referral farther from the hip.[5] This is important because the farther the pain referral is from the hip, the longer the length of time until proper diagnosis.

If an early diagnosis is made, immobilization and reduction of weight-bearing may have a successful outcome. However, if there is too much slippage, the treatment becomes surgery, ranging from single-screw fixation to urgent hip-joint aspiration, followed by closed reduction and single- or double-screw fixation.[2]

Conclusion

For the chiropractic physician, the key to making an early diagnosis is including a hip evaluation in all adolescent and child patients who present with knee, thigh or groin pain. Once radiographs have been acquired, Klein's line will confirm the presence of SCFE. Once the diagnosis has been established, an immediate orthopedic referral should be made.

References

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