Osteochondritis Dissecans of the Lateral Tibial Condyle Associated With Agenesis of Both Cruciate Ligaments

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Abstract

Osteochondritis dissecans is a rare cause of painful knees in children. Only 10 cases of lateral tibial condyle involvement have been reported in the literature. Congenital agenesis of both cruciate ligaments has been described even less, and its prevalence is unknown. The authors report an atypical association of osteochondritis dissecans of the tibia with congenital absence of both cruciate ligaments. A 12-year-old male soccer player presented with a painful right knee. Magnetic resonance imaging revealed the diagnosis. The child was treated conservatively. At 18-month follow-up, radiographs showed osseointegration of the osteochondritis dissecans, and the patient had resumed normal athletic activity without pain. To the authors’ knowledge, this is the only report describing such an association. The authors discuss the possible etiology of osteochondritis dissecans associated with agenesis of the cruciate ligaments and highlight the possibility of this association when osteochondritis dissecans of the tibia is diagnosed in a child with a painful knee. In this patient, the strain due to anteroposterior instability may have been the cause of osteochondritis. Conservative treatment should be considered in this setting.

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The etiology of osteochondritis dissecans remains unclear. Osteochondritis dissecans consists of partial or complete separation of an osteochondral fragment from the articular surface and is most commonly observed in boys and athletes.1 The sites most commonly affected are the medial femoral condyle, the lateral femoral condyle,2 and, less often, the bottom of the patella.3 Only 10 cases of lateral Tibial condyle involvement have been reported in the literature.4 A discoid lateral meniscus is the associated congenital abnormality most commonly described with osteochondritis dissecans of the knee.3 Congenital absence of the anterior cruciate ligament is a rare anomaly, described sporadically in the literature.2–10 Congenital agenesis of both cruciate ligaments has been described even less, and its prevalence is unknown.11–16 The association of agenesis of the cruciate ligaments and osteochondritis dissecans of the lateral Tibial condyle has not been previously reported.

**CASE REPORT**

A 12-year-old male soccer player presented with a painful right knee. Physical examination of the knee revealed full range of motion with no frontal laxity, a slightly positive result on the anterior drawer test, a positive result on the Lachman test, and a negative result on the pivot shift test. Radiographs showed a zone of radiolucency of the right lateral tibial condyle with hypoplasia of both the tibial intercondylar eminence and the femoral intercondylar notch (Figure 1). Hypoplasia of the medial tibial condyle and lateral femoral condyle was also observed with significant distal femoral valgus. Magnetic resonance imaging (MRI) showed a 12-mm osteochondral fragment dissection in the lateral tibial condyle surrounded by circular cartilage damage (Figure 2). Magnetic resonance imaging also showed complete agenesis of the cruciate ligaments. The femoral intercondylar notch was not sufficiently deep and was completely covered with cartilage. In addition, a single tibial spine also completely covered by cartilage was revealed. The middle segment of the lateral meniscus presented an incomplete horizontal lesion (Figure 3). Surgery was not performed. Treatment consisted of rest without sport for 1 year.

At 6-month and 1-year clinical follow-up, the patient had no lameness or pain on palpation of the lateral tibial condyle. At 1 year, MRI findings were stable for both osteochondritis of the lateral tibial condyle and the lateral meniscal lesion. At 18-month follow-up, radiographs showed osseointegration of the osteochondritis dissecans, and the patient had resumed normal athletic activity without pain (Figure 4).

**Discussion**

The knee is the main site of osteochondritis dissecans, which causes separation of pathological subchondral bone, resulting in the formation of an intra-articular free foreign body in the most advanced forms of the disease. The etiology of osteochondritis dissecans remains unknown. Several pathophysiological hypotheses have been proposed, including traumatic, ischemic, genetic, and abnormality of accessory ossification centers, but it probably has a multifactorial cause.17–19 In the current patient, the strain due to anteroposterior instability may be the cause of osteochondritis. It could also be due to the meniscal lesion.

This patient had anteroposterior laxity and an objective positive result on the Lachman test. This laxity may have caused unusual, repeated microtrauma to the lateral tibial condyle, especially during athletic activities. Agenesis of both cruciate ligaments is a possible etiology of osteochondritis dissecans of the lateral tibial condyle in the context of this hypothesis of repeated trauma. This is the
first report of osteochondritis dissecans of the lateral tibial condyle associated with agenesis of the cruciate ligaments.

A review of the literature revealed 10 cases of osteochondritis of the lateral tibial condyle. Michiels suggested a relationship between the site of tibial osteochondritis and the lateral meniscus. In that brief review, 3 cases of meniscectomies for associated meniscal lesions, 3 cases of meniscectomies without meniscal lesions, and 1 case of suture of the anterior horn of the lateral meniscus were described.

The current patient had a stable lesion of the middle segment of the lateral meniscus on MRI at 1 year. An association between the discoid lateral meniscus and osteochondritis dissecans of the lateral femoral condyle has been described. The hypothesis is that this lesion occurred secondary to microtraumatic stress caused by the discoid meniscus on the growing osteochondral structure because the lesion was located in the inferocentral area in contact with a damaged discoid meniscus. These lesions are only observed in young patients and disappear after meniscectomy.

Conservative treatment was justified because of the patient’s young age. Spontaneous healing of small meniscal tears and osteochondritis dissecans of the femoral condyle is common before the age of 12.

Given the frequent but fickle association between meniscal lesions and osteochondritis dissecans of the lateral tibial condyle and the unknown origin of osteochondritis dissecans, it is difficult to determine the most likely cause of osteochondritis dissecans of the tibial condyle. Agenesis of the cruciate ligaments causes repeated microtrauma, which could lead to osteochondritis. However, microtrauma can also cause a meniscal lesion, and osteochondritis would be secondary to this lesion.

**CONCLUSION**

This case highlights the rare association of agenesis of the cruciate ligaments and osteochondritis dissecans of the tibia. Clinicians should be aware of this association when isolated osteochondritis dissecans of the tibia is diagnosed radiographically for a child with a painful knee. Conservative treatment should be considered in this setting.

**REFERENCES**