

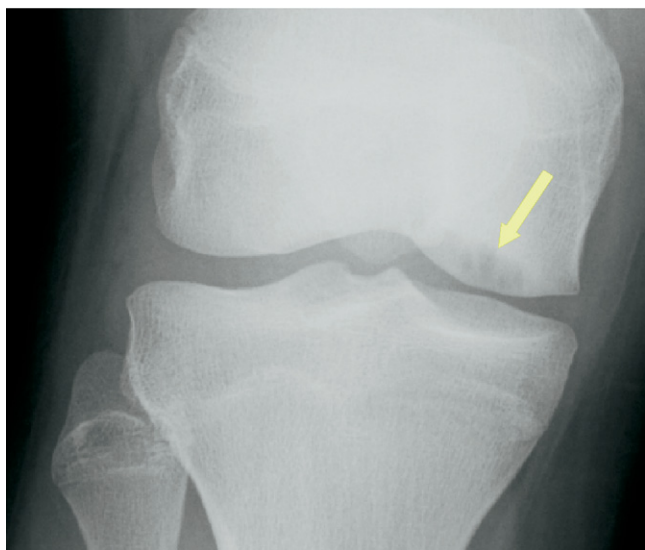
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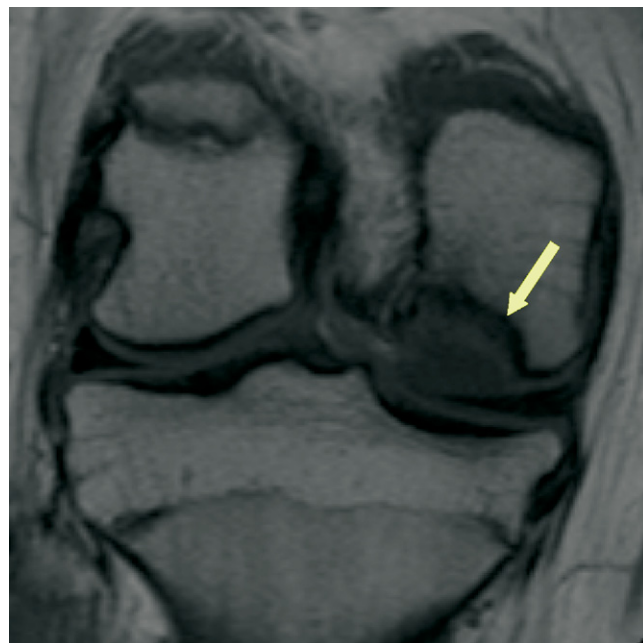
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**Figure 1.** Anteroposterior radiograph of the right knee of an adolescent athlete, revealing closed physes and a subcortical lucency at the articular surface of the medial femoral condyle (arrow).



**Figure 2.** Coronal T1-weighted MRI image reveals a very large osteochondral (ie, involving both cartilage and bone) defect of the medial femoral condyle (arrow). Used with permission of Daniel J. Pallin, MD, MPH, Division of Emergency Medicine, Children's Hospital Boston, and Department of Emergency Medicine, Brigham and Women's Hospital, Boston, MA.

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Figure 1 shows an anteroposterior radiograph of the right knee of a 15-year-old lacrosse player. She reported having fallen onto the flexed knee 1 week ago, experiencing only minor discomfort at the time. She was able to walk immediately after injury. On further questioning, she admitted to several months of vague pain in the knee, which had limited her athletic participation. She was otherwise healthy. Physical examination revealed a mildly antalgic gait; a normal-appearing knee; mild medial joint-line tenderness; stability to varus, valgus, anterior, and posterior stress; and negative Lachman's and McMurray's tests.

*For the diagnosis and teaching points, see page 409.*

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### DIAGNOSIS:

*Osteochondritis dissecans.* The radiograph reveals a lucency in the subchondral area of the lateral aspect of the right medial femoral condyle. This is diagnostic of osteochondritis dissecans, a necrotic bone lesion of unknown etiology, which occurs in adolescent athletes and can occur in adults. It is rare, with an incidence of about 20 per 100,000 people.<sup>1</sup> It is most commonly observed in the knee, especially in the lateral aspect of the medial femoral condyle, and is second most commonly observed in the ankle, usually in the talar dome. It often leads to separation of a bony fragment, resulting in a disrupted joint line and a loose body in the joint. Orthopedic referral is mandatory. Most cases are staged with magnetic resonance imagery (MRI) (Figure 2). Lesions meeting MRI criteria for stability are treated with a period of immobilization and close observation. Lesions thus deemed to be unstable are treated operatively with debridement, pinning, resection, or bone grafting. This patient required surgery. By the time of the operation, the fragment had displaced and was found in the suprapatellar bursa. The donor site was debrided and the fragment was reimplanted with absorbable nails.

This case of mild, subacute trauma also reminds us to think outside the box. The minor trauma 1 week before presentation was not relevant to the underlying disease process. Anchoring to the history of trauma would have led to misapplication of the Ottawa Knee Rule<sup>2</sup> and possibly false reassurance. Osteochondritis dissecans can certainly be managed with immobilization and orthopedic referral, and without radiographs. However, if the patient failed to follow up, the emergency physician could have been blamed for the eventual displacement of the fragment, described above.

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### DIAGNOSIS:

*Segond fracture.* The Segond fracture is a small vertical avulsion injury of the lateral aspect of the proximal tibia immediately distal to the tibial plateau. The mechanism of injury is an axial load on a semiflexed knee, with internal rotation and varus stress.<sup>1,2</sup> The fracture has a strong association with an anterior cruciate ligament tear (75% to 100%), as well as meniscal injury (67% to 75%)<sup>3-6</sup> (Figure 2). A hemarthrosis is commonly present.<sup>3</sup> Clinically, signs of anterior instability such as a positive pivot-shift test result, Lachman's test, and anterior draw sign may be present.<sup>3</sup> The most specific clinical test is the pivot-shift test, but false-negative results may occur from a locked knee or guarding.<sup>4</sup> Furthermore, physical examination (Lachman's and anterior draw test) to evaluate the function of the anterior cruciate ligament may be unreliable as result of pain, hamstring resistance, or effusion.<sup>7</sup> Radiographically, the bone fragment is located on the lateral edge of the tibial condyle and is best visualized on the anterior-posterior view. The Segond fragment, seen on plain radiograph, is identified by magnetic resonance imaging only in one third of cases.<sup>6</sup> Although magnetic resonance imaging is not sensitive in the detection of the Segond fracture fragment, it is useful in demonstrating associated ligamentous and meniscal injuries.<sup>6</sup>

Management entails elevation, ice application, crutches, knee immobilization, and prompt orthopedic referral.<sup>7</sup> Consideration should be given to drainage of tense effusions for pain relief.

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