Occult Osteochondral Fracture in Knee
Kodali Siva R K Prasad MBBS; Altaf Hussain Ms, Mch Orth

ABSTRACT

Occult osteochondral fracture with normal radiographs and MRI scan is extremely rare. This radiological exception to the accuracy of imaging calls for excellence in the exercise of clinical sense, judgment and decision rather than blind dependence on the normality of even sophisticated investigations in the presence of conflicting clinical picture. We are reporting a case of an occult osteochondral fracture of the lateral femoral condyle, which precisely reflected this concept. Arthroscopic intervention and removal of the loose osteochondral fragment alleviated the symptoms promptly and led to a happy result.

Introduction

Osteochondral fractures of knee result from either a direct peripheral shear force or an indirect combination of rotation and compression. The former could involve a substantial peripheral osteochondral fragment, while the latter could lead to central lesions of medial and lateral condyles in adolescents. The role of tibial spine in central intercondylar lesions is debatable. MR imaging is accepted as the gold standard in the diagnosis and management of osteochondral lesions. Even though the central lesions in general are less substantial, it is exceptional that both plain radiographs and MR imaging fail to demonstrate the fragment and consequent defect in the articular cartilage, especially when the lesion is of sufficient size. We are reporting an occult osteochondral fracture, which precisely matched this radiological exception—a situation, which calls for excellence in the exercise of clinical sense and judgment rather than blind dependence on the normality of even sophisticated investigations in the presence of conflicting clinical picture.

Case report

A 14-year old girl presented to the Accident department with a history of twisting her right knee while trying to climb over a fence. She complained of pain over medial aspect of the knee and associated swelling. She also had difficulty in weight bearing. Examination of the knee revealed Grade II effusion, slight tenderness over medial joint line and a restricted range of movements of 0°-40°. Standard X rays of the knee were normal. She was treated with wool and crepe bandage. After a week, she still had pain and difficulty in weight bearing, tender medial joint line and restricted flexion of 90°. She had a course of physiotherapy with no tangible benefit. On subsequent review in orthopaedic clinic, she complained of persisting pain over medial aspect of right knee, occasional clicking, but no locking or giving way. On examination, she had minimal wasting of quadriceps, no effusion, normal patellar tracking and marked tenderness over medial aspect of the knee. Collateral and cruciate ligaments were clinically intact. McMurray’s test was negative with a range of movement from 0°-100°. MRI scan was found to be normal. Because of persisting symptoms, it was decided to schedule her for arthroscopy of the right knee.

Arthroscopy revealed Grade I fibrillation on the superolateral part of patellar articular surface, normal menisci and anterior cruciate ligament. A loose body was found in front and medial to anterior cruciate ligament in the intercondylar region. A healed crater, which was relatively smooth, was noted on the (non-weight bearing) lateral aspect of the lateral femoral condyle.

KEY WORDS: Occult Osteochondral fracture Lateral femoral condyle Knee Loose body
Figure 1: Photographs of right knee anteroposterior and lateral projections.

Figure 2: Photographs during arthroscopy, showing the loose body medial to ACL and osteochondral defect in the non-weight bearing area of the lateral femoral condyle.

Figure 3. Photograph of the loose body after arthroscopic removal.
Arthroscopic appearances were consistent with an osteochondral fracture, which sheared off from the non-weight bearing lateral aspect of the lateral femoral condyle and lodged in the medial intercondylar region. Following arthroscopic removal of the loose fragment, she made a swift uneventful recovery with complete resolution of symptoms and regained full function of the knee.

**Discussion**

Osteochondral fracture is the most common cause of a loose body in an otherwise normal knee before epiphyseal closure. Concomitant association of ligamentous and meniscal injuries and vice versa influence the management of symptomatic osteochondral fractures. The differential diagnosis of an osteochondral loose body includes osteochondritis dissecans with complete separation of an osteochondral segment from the adjacent normal articular cartilage. Fairbank, Aichroth and Smillie subscribed to the aetio-pathological basis of fracture in osteochondritis dissecans. Osteochondral fractures are frequently found on the weight bearing surfaces of the femoral condyles, while osteochondritis dissecans is common on the inner aspect of the medial femoral condyle.

The understated, underdiagnosed and undertreated picture of osteochondral fractures has changed by the recent explosion of sporting enthusiasm and injuries, expansion of sensitive diagnostic magnetic imaging and evolution of surgical advances and techniques. Plain x-rays are of limited value because chondral fractures are not at all visualised and even a large osteochondral fragment may have only a small ossific component. Therefore x-rays merit careful assessment for telltale signs of even the smallest ossified fragment.

MR imaging is sensitive, specific and accurate and represents a most valuable non-invasive imaging modality of choice in the diagnosis, assessment, therapeutic planning and monitoring of osteochondral fractures and lesions and avoids unnecessary interventional procedures. Excellent contrast and spatial resolution coupled with multiplanar image reconstruction ensures the unsurpassed superiority of MR imaging. The state of the articular cartilage is the key determinant in the management of osteochondral lesions. MR images not only elucidate the nature, site, size, surface, subchondral status and stability of the lesion relative to weight bearing, but also delineate and distinguish an intact articular cartilage, an affected segment without a defect, a defect with partial detachment or a totally detached loose body.

Hogerle et al correlated 3-D MRI with subsequent arthroscopy and found good demonstration of normal anatomical structures and excellent reliability for the diagnosis of serious cartilage damage (sensitivity 100%, specificity 100%), but sub-optimal for mild cartilage lesions (sensitivity 60%, specificity 99%).

Riel et al prospectively compared MRI and arthroscopy within 48 hours of imaging and concluded that the sensitivity, specificity and accuracy for full thickness articular cartilage lesions are 73, 100 and 92 per cent respectively and therefore is a safe and valuable adjunct to clinical examination and efficient preoperative planning.

Zampa et al concluded that opposed-phase of GRE, quick sequences, available on all MR systems, are superior to conventional T1 weighted images in detecting occult injuries of the knee. Injuries are more conspicuous because their signal intensity is lower due to simultaneous presence of fat and water protons, which is typical of bone trauma. GRE sequences make a useful and rapid complement to T1/T2-weighted fat saturation acquisitions in the study of the post-traumatic knee.

Discrepant findings between MRI and arthroscopy may be due to insufficient MRI technique, inexpert interpretation or insufficient arthroscopic evaluation. Close cooperation between radiologists and surgeons improves the understanding of their respective methods and enhances the accuracy. Fixation of osteochondral fragment is recommended in large accessible weight bearing areas. However, if surgery is delayed for more than 10 days as in our case, fixation is contraindicated as the articular defect has already started to fill with fibrocartilage.

Our case has several unique features. Standard roentgenograms did not demonstrate any abnormality. MRI neither identified the condylar defect, nor the loose body. Presence of effusion on initial presentation and persisting symptoms raised a high index of suspicion of an occult osteochondral fracture, not evident on radiographs and MRI scan. Arthroscopy confirmed the clinical suspicion and revealed a loose osteochondral fragment from the non-weight bearing area of the lateral condyle of femur, lodged anterior to the anterior cruciate ligament in the intercondylar region. Arthroscopic removal of the offending loose osteochondral fragment led to prompt relief of symptoms.

Our case clearly illustrates that while imaging normality and interpretation may have a high degree of accuracy, sensitivity and specificity, imaging is not a substitute to clinical sense. Clinical awareness of the limitations of even the most advanced and sophisticated investigations is an essential ingredient of sound clinical acumen and judgment and a hallmark of a good clinician. Clinician should be alert to protect himself from being lulled into a false sense of security and inaction because of investigational normality.

**REFERENCES:**

5. Zampa V. Carafoli D. Grassi L. Cosottini M. Trippi D. Ortori S.
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>

Bagnolesi P Usefulness of opposed-phase gradient-echo technique in the diagnosis of occult lesions of the knee and comparison with traditional T1-weight sequences (in-phase), Radiologia Medica.99 (1-2) :31-5, 2000.