



Osteochondritis dissecans occurring in the patella and medial femoral condyle in the same knee

Aynı dizde patella ve medial femoral kondilde görülen osteokondritis dissekans

Alper KAYA, Berk GUCLU, Dogac KARAGUVEN, Ismet Teoman BENLI, Omur ATAOGU¹

Ufuk University School of Medicine, Ortopedics and Traumatology Department; ¹Mikropat Pathology Laboratory

Osteokondritis dissekans (OKD) eklem kırırdağının, altındaki subkondral kemikle birlikte kemikten ayrıldığı bir durumdur. Klasik yerleşimi medial femoral kondilidir. Bu yazıda, aynı dizde hem medial femoral kondilde hem de patellada OKD tanısı konan 14 yaşında bir erkek hasta sunuldu. Hasta, spor yaptıktan sonra sol dizinde ortaya çıkan ağrı, şişlik ve takılma şikayetleriyle başvurdu. Manyetik rezonans görüntülemeye patelladaki lezyonun parçalı olduğu ve tam ayrıldığı, instabiliteye neden olduğu görülerek artroskopik cerrahi tedavi planlandı. Kondiler lezyona in situ tespit, patelladaki lezyona ise debridman uygulandı. Altıncı ay kontrolünde hastanın eklem hareket açıklığı tam idi, patellar öğütme testi ile bir miktar ağrı olduğu görüldü.

Anahtar sözcükler: Artroskopi; debridman; diz eklemi/cerrahi; osteokondritis dissekans/cerrahi; patella/cerrahi.

Osteochondritis dissecans (OCD) is a condition in which a portion of articular cartilage separates from the bone together with the underlying subchondral bone. Its classical localization is the medial femoral condyle. We presented a 14-year-old boy who had OCD lesions in both the medial femoral condyle and patella in the same knee joint. He presented with complaints of pain, swelling, and locking following sports activities. Magnetic resonance imaging showed completely detached loose bodies causing instability. Arthroscopic treatment was performed including in situ fixation of the condylar lesion and debridement of patellar lesions. At six-month follow-up, he had full range of motion of the knee joint, with some pain in the patellar grind test.

Key words: Arthroscopy; debridement; knee joint/surgery; osteochondritis dissecans/surgery; patella/surgery.

Osteochondritis dissecans (OCD) is a localised process in which an osteochondral fragment may detached from underlying subchondral bone, whose etiology is not clearly known.^[1] It mostly appears during the adolescence period. Its frequency is stated to be % 0.02 – 1.2. It is seen in males twice as frequent as the females. Even though its patophysiology is not clearly known, various investigations point to be an inflammatory phenomenon, vascular insufficiency, repetitive microtrauma, and genetic factors as playing a role in the etiology of this disease.^[2-6]

Osteochondritis dissecans (OCD) occurs mainly in the knee joint (75 %). Generally it relates to only

one joint. 15 – 30 % of the events are bilateral.^[7] Most frequent location in the knee joint are seen in the medial condyle (over 85 %), and here it is mostly seen in the lateral of the medial femoral condyle, in the intercondylar notch area.^[1,8] Its frequency in patella is less than 1 %.^[1]

Despite the absence of studies for treatment oriented for a wide range of patient groups, different treatment options have emerged as a result of small event series and experiences of the authors treating it.^[2] In addition to this, there is an agreement about the fact that not separated lesions, smaller than 2 cm settled at typical places in the femur seen in children

Correspondence / Yazışma adresi: Dr. Alper Kaya, University School of Medicine, Department of Orthopaedics and Traumatology, Dr. Ridvan Ege Hospital, Mevlana St. 86-88, Balgat, Ankara, Turkey. Phone: +90312 - 204 41 26 e-mail: alperkaya@yahoo.com

Submitted / Başvuru tarihi: 23.07.2008 **Accepted / Kabul tarihi:** 05.01.2009

© 2009 Türk Ortopedi ve Travmatoloji Derneği / © 2009 Turkish Association of Orthopaedics and Traumatology

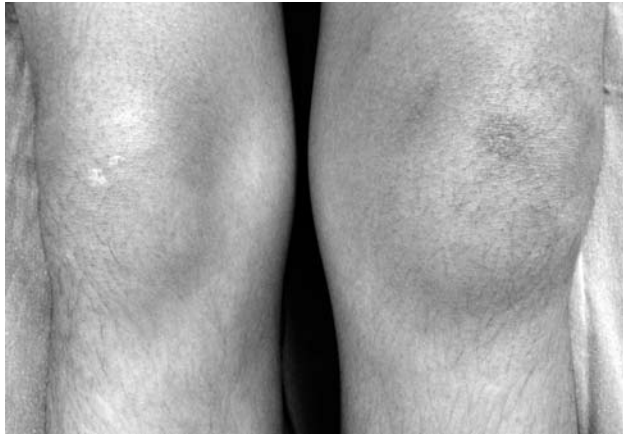


Figure 1. Effusion is seen in the left knee.

whose growing plates are open have good prognosis.^[2] As for the unstable and displaced lesions, surgical fixation is recommended in order to ensure the continuation of the joint surface, protect the hyaline cartilage and making the fragment heal to the main bone.

In the cases the fixation is not performed, cartilage reconstruction methods are preferred.^[1]

Case report

14 year-old boy presented with complaints of pain, swelling and locking in his left knee after sports activities. With physical examination, effusion was detected in the left knee. Range of knee motion was between 10 – 100 angle; full extension was very painful, and retropatellar pain and crepitating was observed in flexion – extension (Figure 1). It was learnt from his background that he had pain and swelling in the left knee from time to time and when he made sports and his brother had an operation when he was 15 with Osteochondritis dissecans (OCD) diagnosis.

Plain radiographs showed two osteochondral lesions on medial femoral condyle and patella in left knee (Figure 2a, b). Magnetic resonance imaging (MRI)

Figure 2. (a,b) Lesions in the femur medial condyle and patella at the antero-posterior and lateral radiographics. Lesions are seen in the magnetic resonance imaging (c) in the coronal T₁-, (d) sagittal T₂- and (e) transverse T₂-weighted images.



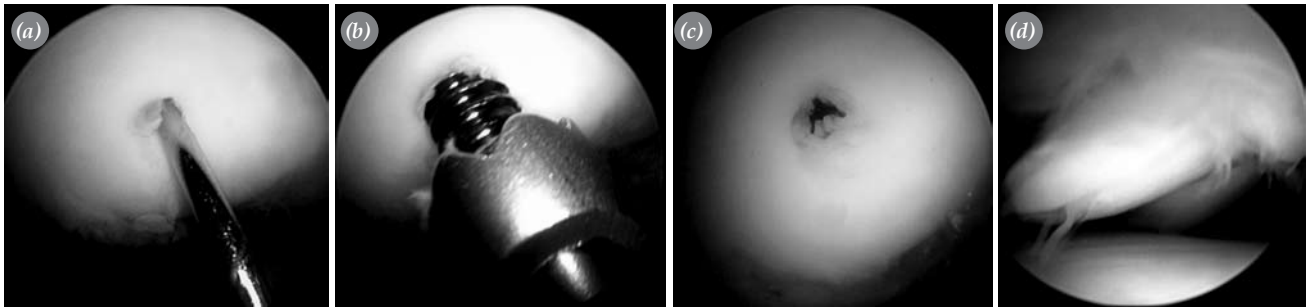


Figure 3. Intraoperative appearance of, (a) antegrade perforation of the lesion in the medial condyle, (b) fixation with cannulated compression screw, (c) appearance of the lesions after fixation, and (d) lesions in patella.

demonstrated an in situ Stage 1 OCD in medial femoral condyle and two fragment totally detached Stage 2 OCD in patella according to the MRG classification of Bohndorf.^[9] (Figure 2c - e). Arthroscopic treatment was planned for the patellar lesion that is fully separated and causing instability.

Arthroscopic surgery performed under general anesthesia under appropriate conditions using the anterolateral and anteromedial standard portals. Seeing that lesion in the femur medial condyle started to dispatch from the lateral side and medial side was in good condition (according to Guhl classification^[10] antegrad perforation was made with K – wires (Figure 3a). Later, the lesion was fixed with a cannulated, headless titanium compression screw of 3.5 mm width and 20 mm length (Figure 3 b, c). The screw was seen to be fully embedded in the cartilage; knee joint was moved and the screw was ensured not to harm the opposite joint surface. The lesion in the patella was seen to be dispatched from the flap type crater in two pieces and its was covered by fibrous tissues (Figure 3d). Having excised the osteochondral pieces, debridement was applied to the crater. Finding that the other in-joint structures are in normal condition, the operation was ended, ice and Jones bandage was applied. After the operation, the patient's knees were imaged in plain radiographies (Figure 4). Pieces taken from the patella were evaluated with pathological examination (Figure 5).

After the operation knee exercises performed, and he walked with two crutches with non weightbearing. At the sixth month's follow-up, the knee extension was full and at the patellar grind test there was a little pain; but the patient said that he was more comfortable while walking up and down the stairs, the pain in the knee was less compared to the pre-operation time and the feeling of locking disappeared.

Discussion

The term “osteochondritis dissecans” was first used for Franz Könnig in 1887 for the free cartilage fragments in knee, elbow and ankle joints seen in young adults.^[11] This is a disease generally seen



Figure 4. Postoperative plain radiographies of the patient, (a) antero-posterior, and (b) lateral

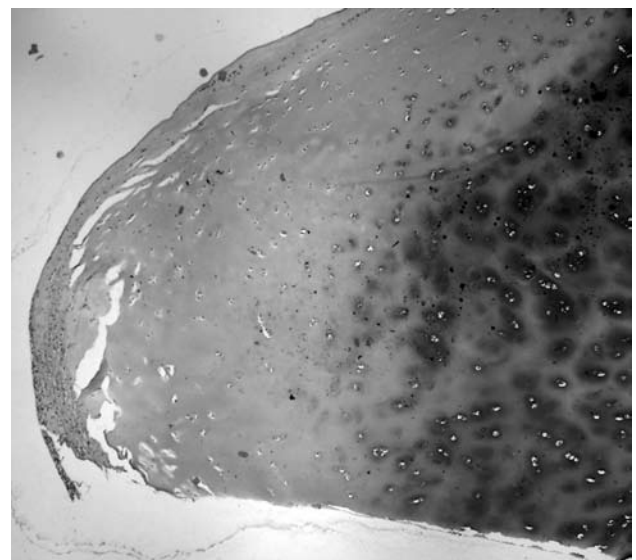


Figure 5. Histological appearance of the lesions excised from the patella. Cartilage and the subchondral bone are seen (H-Ex40).

in the knee joint with etiology not fully understood and that the cartilage can separate together with some subchondral bony tissue. The case we report was an adolescent who has excessive sportive activities. As one more member of the family was diagnosed with OCD, it can be interpreted that both genetic factors and cumulative trauma can play roles in the etiology.

Treatment of juvenile OCD is conservative in early periods. Surgical therapy is applied in stages when separation begins or in full separation. Fixation is recommended when there are any fragments that can be fixed, and cartilage re-construction techniques are applied if condition is not suitable for fixation. K-wires, Herbert and similar compression screws, absorbable screws or rods can be used for fixation.^[2] Good results have been reported for 3.5 mm AO compressions screws used for fixation. Together with this, Makino et al.^[12] reported stable healing and smooth joint surface with second-look arthroscopy in 14 patients out of 15 that they performed fixation with headless Herbert compression screws. Screws do not cause damage on the joint surface as long as they do not protrude out on the cartilage surface. We preferred fixation with 3.5 mm headless compression screw in our case also. Drilling or micro-fracture, autolog chondrocyte implantation and osteochondral autogenous grafting (mosaicplasty) are included in cartilage reconstruction techniques.^[1,8,11,13]

Hefti et al.^[7] reported in the multicenter study that 713 patients were evaluated that 51% of the lesions had classical localization (on the lateral side of the medial condyle), 19% were in central localization in the medial condyle, 7% were in the medial of the medial condyle, 17% in lateral condyle, and 7% were in the patella. In the same article, lesions in more than one joint other than the knee were reported only in three patients (one ankle and two elbows). In the case report of Hanna et al.^[11] however, two cases with medial and lateral femoral condyles OCD lesions were reported for the first time in the literature. Distinction of our case was that there were OCD lesions in different stages both in femoral medial condyle and patella in the same knee in different stages. Although etiology of OCD in patella is unknown, it is thought that impairment of the circulation in patella, trauma, genetic factors, or a combination of these can be effective.^[14] Trauma can be direct, or it can arise from acute or chronic effects of tangential shearing forces on pa-

tella. Our case being involved particularly in contact sports suggests that the underlying cause of patellar lesions can be a combination of trauma and genetic factors. Although there is not a consensus in the treatment of patellar OCD, general approach is to perform only debridement in advanced stages.^[13] Since fixation of small lesions does not give results as good as expected, removing the fragment and debridement of the crater is recommended, while fixation is recommended for large lesions.^[13,14] However, fragments large enough for fixation are rarely seen. Schwarz et al.^[14] have reported the results of 31 cases that surgical treatment was performed because of patellar OCD. Curettage and removal of the free fragment was applied for most of the cases; however, it was reported that results were good only in 38% of the patients, and pain in the anterior of the knee continued. Lesion with dimensions of 1x1cm in the midline of patella was removed in two separate fragments and debridement was applied in the crater. Results of patellar OCD lesions are poorer as compared to those with classical localizations.^[14] Although our case did not have any complaints when walking simply in the control in the sixth month, having some pain when climbing up and down stairs that is similar with the findings in the literature. Difference of our case from those reported in the literature is that his OCD lesions were in two different localizations in the same knee joint. Patellar lesions are seen very rarely. Although two cases have been reported with bicondylar OCD accompanying medial condyle,^[11] OCD in both medial condyles and patella have not been reported. Treatment of particularly patellar lesions is more problematic as compared to those in condyles, and their results are also worse as compared to those with classical localizations.

In conclusion, OCD is a disease that must be thought of in sportive patients complaining of frequent pain and swelling in the knee and that are exposed to low-energy traumas, particularly in adolescence period. Physical examination, plain x-rays and MRI are valuable for diagnosis. Treatment must be planned according to the stage of the lesion, and reserving the intact cartilage must be attempted to. Simultaneous lesions can be seen in the same joint with different localizations, although they are rare.

References

1. Tandoğan NR, Ozgür F, Akkaya T. Osteokondritis dissekans. *Acta Orthop Traumatol Turc* 2007;41 Suppl 2:113-22.

2. Gomoll AH, Flik KR, Hayden JK, Cole BJ, Bush-Joseph CA, Bach BR Jr. Internal fixation of unstable Cahill Type-2C osteochondritis dissecans lesions of the knee in adolescent patients. *Orthopedics* 2007;30:487-90.
3. Lindén B. The incidence of osteochondritis dissecans in the condyles of the femur. *Acta Orthop Scand* 1976;47:664-7.
4. Bradley J, Dandy DJ. Osteochondritis dissecans and other lesions of the femoral condyles. *J Bone Joint Surg [Br]* 1989;71:518-22.
5. Mubarak SJ, Carroll NC. Familial osteochondritis dissecans of the knee. *Clin Orthop Relat Res* 1979;(140):131-6.
6. Reddy AS, Frederick RW. Evaluation of the intraosseous and extraosseous blood supply to the distal femoral condyles. *Am J Sports Med* 1998;26:415-9.
7. Hefti F, Beguiristain J, Krauspe R, Möller-Madsen B, Riccio V, Tschauer C, et al. Osteochondritis dissecans: a multicenter study of the European Pediatric Orthopedic Society. *J Pediatr Orthop B* 1999;8:231-45.
8. Crawford DC, Safran MR. Osteochondritis dissecans of the knee. *J Am Acad Orthop Surg* 2006;14:90-100.
9. Bohndorf K. Osteochondritis (osteochondrosis) dissecans: a review and new MRI classification. *Eur Radiol* 1998;8:103-12.
10. Guhl JF. Arthroscopic treatment of osteochondritis dissecans. *Clin Orthop Relat Res* 1982;(167):65-74.
11. Hanna SA, Aston WJ, Gikas PD, Briggs TW. Bicondylar osteochondritis dissecans in the knee: a report of two cases. *J Bone Joint Surg [Br]* 2008;90:232-5.
12. Makino A, Muscolo DL, Puigdevall M, Costa-Paz M, Ayerza M. Arthroscopic fixation of osteochondritis dissecans of the knee: clinical, magnetic resonance imaging, and arthroscopic follow-up. *Am J Sports Med* 2005;33:1499-504.
13. Akgün I. Osteokondritis dissekans. In: Tandoğan NR, Alpaslan AM, editörler. *Diz cerrahisi*. Ankara: Haberal Eğitim Vakfı Yayınları; 1999. s. 247-59.
14. Schwarz C, Blazina ME, Sisto DJ, Hirsh LC. The results of operative treatment of osteochondritis dissecans of the patella. *Am J Sports Med* 1988;16:522-9.