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Case Report / *Olgu Sunumu*

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Arthroscopic resection of osteochondroma of the knee: two case reports

Diz osteokondromunun artroskopik rezeksiyonu: İki olgu sunumu

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In this article, we report two cases of arthroscopic resection of symptomatic intraarticular osteochondroma of the knee. The first case was a 27-year-old male presenting with slowly progressive left knee pain while sitting and climbing up stairs. The second case was a 24-year-old female presenting with slowly progressive right knee pain while running downhill and squatting deeply. Preoperative radiographs and magnetic resonance images revealed an intraarticular, locally expanding, mineralized mass at adjacent to the trochlea of the femur for both patients. These osteochondromas were arthroscopically resected, which led to complete relief of symptoms and return to full activity within two weeks. There has been no return of symptoms within three years and one year of follow-up, consecutively. We highlight that an arthroscopic resection of a symptomatic intraarticular osteochondroma may be less painful, has better cosmetic results and the postoperative recovery is faster, compared to the traditional open approach.

Key words: Arthroscopic surgery; exostosis; intraarticular; knee; osteochondroma.

Bu yazıda, diz eklemi içinde semptomatik osteokondromun artroskopik rezeksiyonunun yapıldığı iki olgu sunuldu. İlk olgu, oturma ve merdiven çıkma sırasında yavaş ilerleyici sol diz ağrısı ile başvuran 27 yaşında erkek hasta idi. İkinci olgu ise, yokuş aşağı koşma ve derin çömelme sırasında yavaş ilerleyici sağ diz ağrısı ile başvuran 24 yaşında kadın hasta idi. Ameliyat öncesi röntgen ve manyetik resonanans görüntülerde her iki hastada da femur trokleasına bitişik büyümüş, eklem içi mineralize kitle görüldü. Bu osteokondromlar artroskopik olarak çıkarıldı ve iki hafta içinde semptomlarda tamamen rahatlama ve tam aktiviteye dönüş gerçekleşti. Olgularda sırasıyla üçüncü ve birinci yıl sonunda semptomlara tekrarlama görülmedi. Semptomatik eklem içi osteokondromların artroskopik rezeksiyonun, geleneksel açık yöntemlere kıyasla, daha az ağrılı ve daha iyi kozmetik sonuçları olacağını ve daha çabuk ameliyat sonrası iyileşme görüleceğini vurgulamaktayız.

Anahtar sözcükler: Artroskopik cerrahi; egzostoz; eklem içi; diz; osteokondrom.

Osteochondroma is a benign bone tumor which consists of trabecular bone covered by a cartilage cap. If symptomatic, it causes clinical symptoms due to traumatic contusion and pressure on adjacent muscles, joints, nerves or blood vessels. It is usually located outside the joints.[1-5] We report two cases where the subjects had intraarticular osteochondromas and underwent arthroscopic surgery.

CASE REPORT

Case 1– A 27-year-old male teacher presented with slowly progressive left knee pain for two years and had no history of trauma. He complained of pain in the left knee when he ran, sat and climbed stairs. The pain was significant particularly when he played football which was the most frequent recreational activity in his lifestyle. He had been referred to a hospital for left knee pain one year before. The non-steroid anti-inflammatory drug he had taken for two months did not relieve his pain. He was finally unable to perform daily activities and consulted with orthopaedic surgery.

Clinical examination revealed a painful patellar grind test in the left knee. There was significant pain during loaded flexion. Maximum flexion was 110 degrees while he was capable of full extension.

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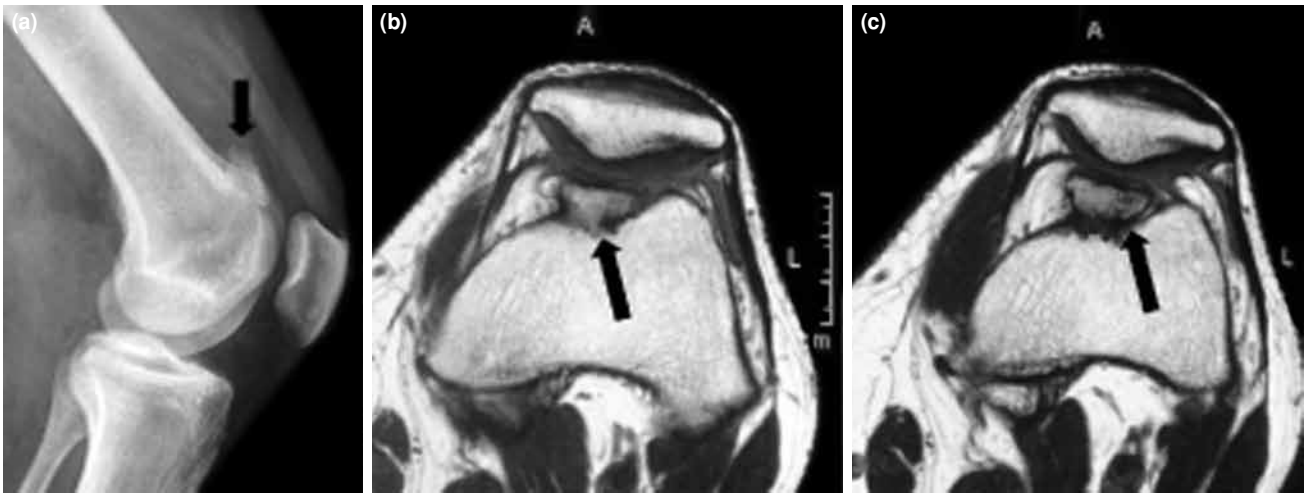

Figure 1. (a) Preoperative lateral radiograph of the left knee, **(b)** and **(c)** Preoperative magnetic resonance imagings, (arrows indicate the bony tumor) *(Case 1)*.

Anteroposterior, lateral and tangential view radiographs revealed an intraarticular, locally expending, mineralized mass at the trochlea of the femur (Figure 1a). Magnetic resonance imaging (MRI) confirmed direct radiographic findings and revealed no abnormalities in other intraarticular structures. Magnetic resonance scans identified continuity of the exostotic cortex and medullary cavity with the cortex and medullary cavity of the bone from which the lesion arose. Magnetic resonance imaging also identified a cartilage cap ranging in thickness from 0.2 to 0.4 mm in the sections (Figure 1b and 1c). Under general anesthesia, an anterolateral portal was used to arthroscopically access the knee. Ligaments, cartilaginous surface and menisci were normal. The mass could easily be seen at the trochlear sulcus from

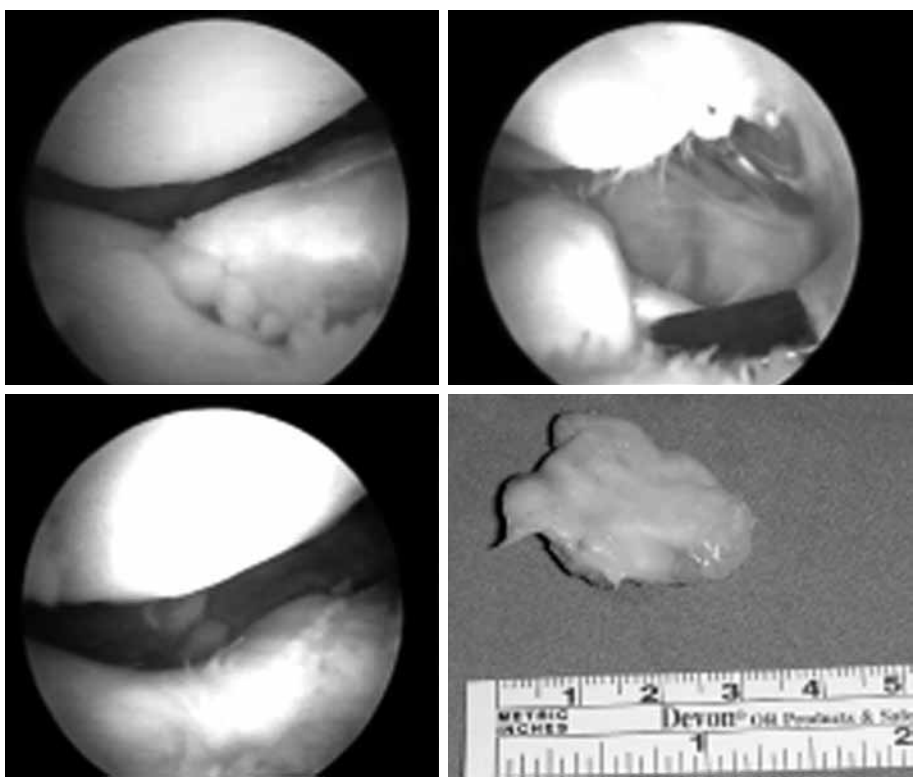

Figure 2. The arthroscopic view of the osteochondroma at the trochlear sulcus of the left femur before (top row) and after resection (bottom left) and the material taken out (bottom right). The bony tumor was 3.5 cm in diameter *(Case 1)*.

Figure 3. (a) Preoperative lateral radiograph, **(b)** and **(c)** T_1 and T_2 weighted images, *(Case 2)*.

anterolateral and anteromedial portals and rubbed on the inferior patellar face during flexion from 50 to 110 degrees (Figure 2). There were mild degenerative chondral changes at the patellofemoral surface. The bony tumor was resected through the auxiliary, superomedial and superolateral portals with the help of an osteotome and the remaining bony surface was abraded by the motorized shaver. The bony tumor was approximately 3.5 cm in diameter (Figure 2). The histologic examination revealed an osteochondroma consisting of cancellous bone covered with a bony cartilage.

Case 2– A 24-year-old female student presented with slowly progressive right knee pain when she ran downhill and deep squatted for one year, with no history of trauma. She had undergone physical therapy for right knee pain for one month before her admission to our hospital. Clinical examination revealed swelling of the right knee and tenderness on the lateral aspect

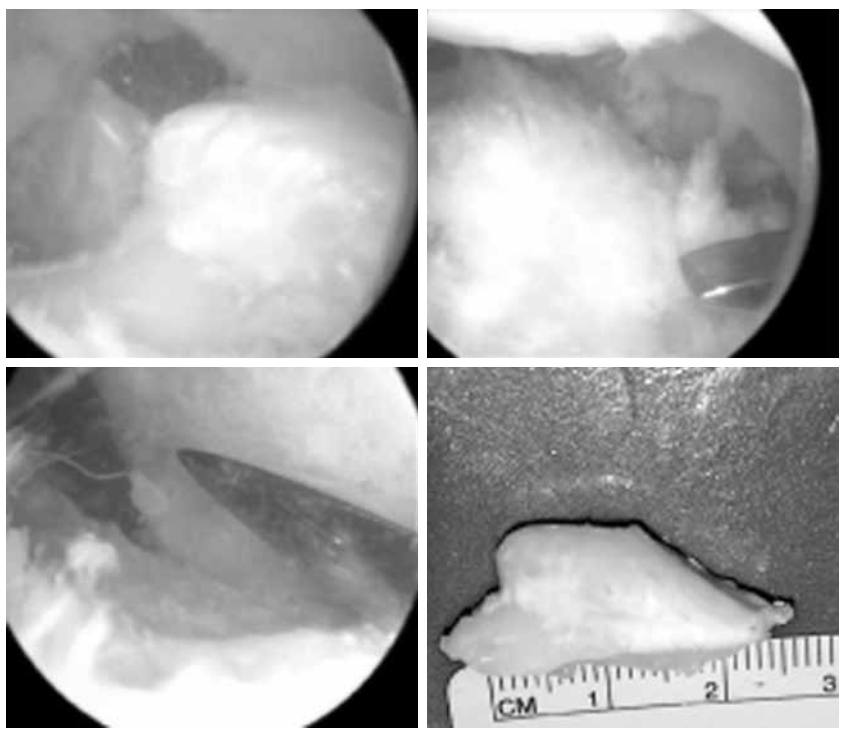

Figure 4. The arthroscopic view of the osteochondroma before (top row) and after resection (bottom left) and the material taken out (bottom right). The bony tumor was 2.5 cm in diameter *(Case 2)*.

of the patellofemoral joint and a painful patellar grind test in the right knee. Range of motion of the right knee was normal. Radiographs revealed an intraarticular, bony wide-based protrusion, a sessile metaphyseal enlargement, or osteochondroma adjacent to the trochlea of the femur (Figure 3). Magnetic resonance imaging confirmed direct radiographic findings and revealed no other abnormalities in other intraarticular structures. Magnetic resonance scans identified continuity of the exostotic cortex and medullary cavity with the cortex and medullary cavity of the bone from which the lesion arose. Magnetic resonance imaging also identified a cartilage cap ranging in thickness from 0.3 to 0.4 mm in the sections (Figure 3). Under spinal anesthesia, arthroscopy was performed and ligaments, cartilaginous surface and menisci were normal. The bony mass was resected through the auxiliary, superolateral and superomedial portals with the help of an osteotome and the remaining bony surface was abraded by the motorized shaver. The bony tumor was approximately 2.5 cm in diameter (Figure 4). The histologic examination revealed an osteochondroma consisting of cancellous bone covered with bony cartilage (Figure 5).

The patients' complaints were completely relieved after surgery and they were able to return to their daily activities by the third postoperative week. Arthroscopic resection of this tumor dramatically eliminated their symptoms. During the three-month and one-year follow-up, the patients had no pain and had full range of motion. The patients had no complaints during sports activities.

DISCUSSION

Osteochondromas, also known as osteocartilaginous exostoses, are the most common benign tumors of bone.[1,6-8] The tumors are usually seen in extraarticular areas however in our patients, the osteochondromas located intaarticularly caused mechanical symptoms and could have caused degenerative osteoarthritis of the patellofemoral chondral surfaces of the knee. The postoperative symptomatic elimination was dramatic and the patients could flex their knees in the normal range. This technique was successful in eliminating clinical symptoms. In addition this technique has better cosmetic results, faster postoperative recovery, and better relief of pain in the postoperative period compared to the traditional open approach. Osteochondromas, although generally asymptomatic, occasionally come to clinical attention for various reasons. Symptoms may result from exostotic impingement on adjacent neural, vascular, or periarticular structures. Pain may result from the traumatic contusion or the fracture of an osteochondroma. The presence of a visible mass may create a cosmetic problem. The exostotic cartilage cap may rarely undergo malignant degeneration, giving rise to chondrosarcomas.[9,10] In our cases the symptoms obviously resulted from the bony impingement on the patellofemoral joint. It is rare to see an osteochondroma in the joint space. As proved by our case as well as the literature, arthroscopic excision is the best treatment and the results are satisfactory.[6,8]

Siebenrock and Ganz[7] reported four cases of osteochondroma of the femoral neck, which were intraarticular in the hip joint. Atik et al.[1] reported a case of intraarticular osteochondroma of the talus which was resected in open fashion. In the literature, there are two case reports of arthroscopic resection of an osteochondroma of the knee.[6,8] We used a four portals approach. This is the best way to visualize

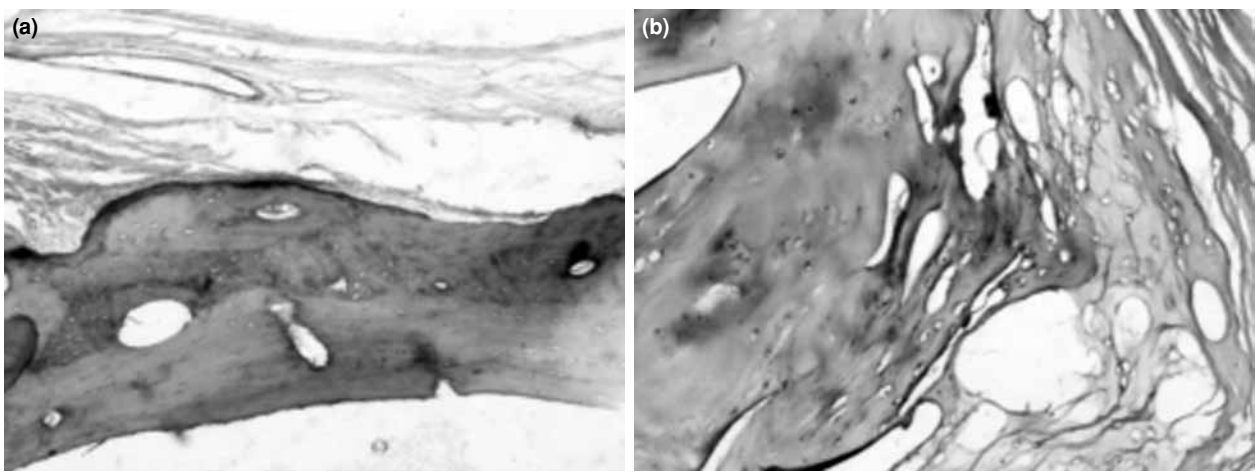

Figure 5. Histologic views of benign cartilage cells. **(a)** Case 1 (H-E x 200) **(b)** Case 2 (H-E x 400).

and resect the bony mass in such a location. We used auxiliary, superomedial and superolateral portals so we could be able to use an osteotome from four different directions for an en bloc resection. This approach is important for two reasons; en bloc excision of the mass make the histological examination enable more accurate and unwanted articular fracture of femur could be less likely.

To our knowledge, this is the third and fourth reported arthroscopic resection of an osteochondroma in the knee joint, a technique found successful in eliminating clinical symptoms.[6,8] Avoiding a standard skin incision may be cosmetically more pleasing, potentially less painful, and lead to a quicker recovery.

Declaration of conflicting interests

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REFERENCES

1. Atik OS, Sarikaya B, Kunat C, Muradi R, Ocaktan B, Topçu H. Osteochondroma of the talus. Eklem Hastalik Cerrahisi 2010;21:116-7.
2. Brien EW, Mirra JM, Luck JV Jr. Benign and malignant cartilage tumors of bone and joint: their anatomic and theoretical basis with an emphasis on radiology, pathology and clinical biology. II. Juxtacortical cartilage tumors. Skeletal Radiol 1999;28:1-20.
3. Carmont MR, Davies S, Gey van Pittius D, Rees R. Accelerated para-articular osteochondroma formation within the knee: a case report. Cases J 2008;1:6. doi: 10.1186/1757-1626-1-6.
4. Ermiş MN, Aykut US, Durakbaşa MO, Ozel MS, Bozkuş FS, Karakaş ES. Snapping scapula syndrome caused by subscapular osteochondroma. Eklem Hastalik Cerrahisi 2012;23:40-3.
5. Ogura K, Goto T, Nemoto T, Imanishi J. Para-articular osteochondroma of the infrapatellar fat pad. J Knee Surg 2011;24:209-13.
6. Schmoyer S, Ciullo JV. Arthroscopic resection of an osteochondroma of the knee. Arthroscopy 2001;17:765-7.
7. Siebenrock KA, Ganz R. Osteochondroma of the femoral neck. Clin Orthop Relat Res 2002;211-8.
8. Takahashi M, Nishihara A, Ohishi T, Shiga K, Yamamoto K, Nagano A. Arthroscopic resection of an intra-articular osteochondroma of the knee in the patient with multiple osteochondromatosis. Arthroscopy 2004;20 Suppl 2:28-31.
9. Lee JK, Yao L, Wirth CR. MR imaging of solitary osteochondromas: report of eight cases. AJR Am J Roentgenol 1987;149:557-60.
10. Murphey MD, Choi JJ, Kransdorf MJ, Flemming DJ, Gannon FH. Imaging of osteochondroma: variants and complications with radiologic-pathologic correlation. Radiographics 2000;20:1407-34.