

## Traumatic articular cartilage injuries of the knee

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### Dizin travmatik eklem kıkırdığı yaralanmaları

Yaralı bir dizde kıkırdak lezyonu büyük bir tanınal sorun oluşturur. Amacımız gittikçe artan sıklıkla gördüğümüz konvansyonel metodlar ile tedavi edilmiş lezyonların tedavi sonuçlarını sunmaktır. Serimizde kıkırdak lezyonu olan 72 hastanın 73 dizi vardır ve bunlar A. Ü. İbn-i Sina Hastanesi Ortopedi ve Travmatoloji bölümüne yatırılmışlardır. 41 dizde patello-femoral eklem lezyonu vardı; geri kalan 32 dizde tibio-femoral eklem lezyonu vardı. Tedavi amacı dizin normal kayma-yuvarlanma mekanizmasını yeniden sağlamak ve kıkırdak lezyonunu tedavi etmektir.

**Anahtar kelimeler:** Diz eklemi, kıkırdak lezyonları

In an injured knee, cartilage lesions present a great diagnostic difficulty. Our purpose is to present the results of cartilage lesions treated with conventional methods which we met with an increasing incidence. There were 73 knees of 72 patients in whom cartilage injury was diagnosed and who were admitted for treatment at the Ankara University İbn-i Sina Hospital, Department of Orthopaedic Surgery and Traumatology. 41 knees had lesions in the patello-femoral joint; the remaining 32 knees had lesions in the tibio-femoral joint. Treatment was designed to regain the normal rolling-gliding mechanism of the knee and to reconstruct or minimize the lesions of cartilage.

**Key words:** Knee joint, cartilage injuries

Although the causes of internal decrement of the knee joint, especially meniscal and ligamentous pathologies, are well systemized with their symptoms and signs, controversy about the symptoms and treatment still exists.

In an injured knee cartilage lesions present a great diagnostic difficulty. Even though the physical examination and the mechanism of the injury is very helpful in diagnosing the cartilage lesion, it is still very hard to estimate the extent of the pathology (1).

Therefore arthroscopic examination is essential for accurate diagnosis and choices of treatment depend on the pathological signs and facilities of the arthroscopic technology (2).

Our purpose is to present the results of cartilage lesions treated with conventional methods which we met with an increasing incidence.

During the period of 1987-1991, there were knees of 72 patients in whom cartilage injury was diagnosed and who were admitted for treatment at the Ankara University İbn-i Sina Medical Center, Department of Orthopaedic Surgery and Traumatology. They ranged from 19-31 years of age. There were 35 female and 37 male patients.

41 knees had lesions in the patello-femoral joint; the remaining 32 knees had lesions in the tibio-femoral joint. Articular cartilage injuries were the second

most frequent arthroscopic diagnosis. It was exceeded only by meniscal injuries.

In 4 cases, traumatic cartilage lesions were combined with ligamentous injuries (Fig. 1).



Figure 1: Cartilage lesions occurred with the same mechanism of acute combined rotational instabilities

In these acute cases accompanying cartilage lesions were the main cause which was influencing the treatment outcome negatively. In 26 cases, clinical and arthroscopic findings were supported by other diagnostic methods such as conventional radiology, computerized tomography and magnetic resonance

imaging. In 43 cases, there were no signs of cartilage lesions with the routine and specific clinical examinations. In acute cases aside from hemarthrosis, most the patients were suffering from post-traumatic knee pain and hydrarthrosis.

The patients were evaluated and classified, with reference to the mechanism and the morphology of the injury (3, 4, 5).

Cartilage lesions associated with bone lesions:

- Intraarticular fracture(Arthroscopically detected) 1
- Osteochondral flake fracture 1
- Traumatic osteochondritis dissecans 2 (Fig. II)

Cartilage lesions without bone lesions;

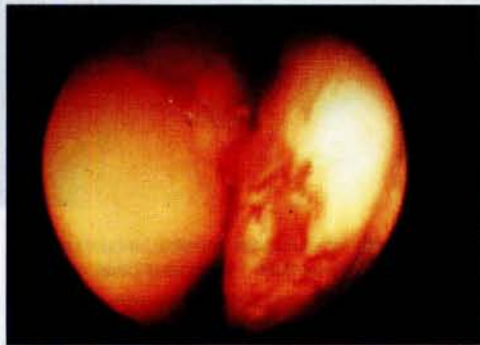
- Cartilage contusion 9 (Fig. III)
- Cartilage fractures 8 (Fig. IV)
- Cartilage flake fracture was observed in 4 knees



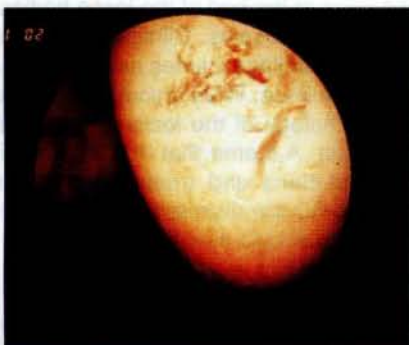
Figur IV: Arthroscopic view of cartilage fractures



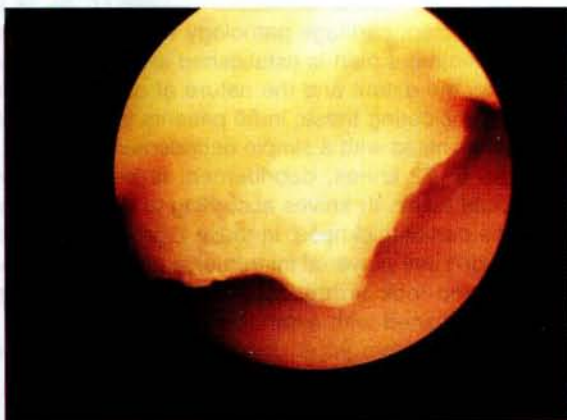
Figur V: Arthroscopic view of grade II in patella



Figur II: Arthroscopic view of cartilage impression fracture



Figur III: Arthroscopic view of cartilage contusion



Figur VI: Arthroscopic view of grade III in patella

Grade I : This lesion involves the superficial and arthroscopically, it appears as a laceration, fibrillation or softening of the articular cartilage to a depth of 1 mm in 19 knees.

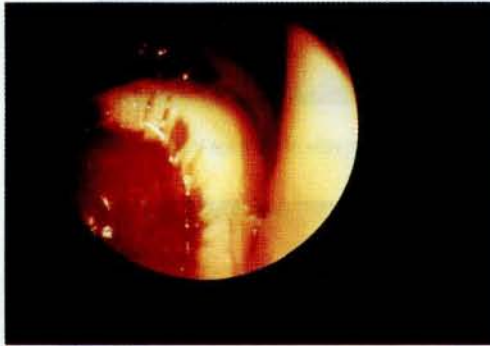
Grade II : This lesion involves the transtional zone; is 1-2 mm in depth, and presents as an ulceration or fibrillation. It may be in the form of an unstable "flap" of articular cartilage in 11 knees (Figur V).

Grade III : In this injury, the deep layer is exposed, but not calcified zone or subchondral bone. It is seen at arthroscopy as loose and fragmented "crab-

McAndrew utilized current knowledge about the influence of depth and size of a lesion on cartilage repair and a classification of chondromalacia is presented for use during arthroscopic evaluation (6). This classification incorporates a slightly modified version of Ficat, Philippe, and Hungerford's system based upon the location of patellar lesions (6, 7).

meat" involving a depth greater than half the articular thickness in 5 knees (Figur VI).

Grade IV : These lesions involve the calcified cartilage and subchondral region. Arthroscopically, a bough gritty sensation is felt upon probing the lesions and subchondral bone is directly exposed in 5 knees (Figur VII).

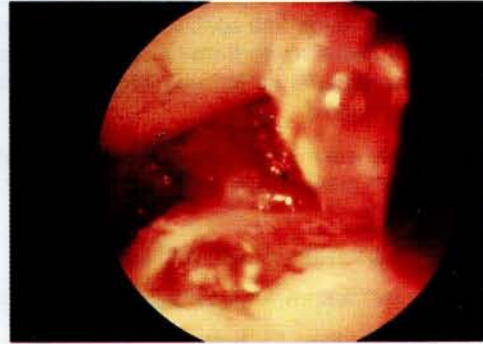


Figur VII: Arthroscopic view of grade IV in patella

Treatment was designed to regain the normal rolling-gliding mechanism of the knee and to reconstruct or minimize the lesions of the cartilage. The first step of treatment was towards primary etiologic pathology. In this group, 4 patients had ligamentous reconstruction and 7 had reconstruction of the extensor mechanism mostly lateral retinacular release (7, 8). In the second step, cartilage pathology was reconstructed. The treatment plan is established after clearly determining the extent and the nature of cartilage lesions (9). Considering these; in 30 patients the primary access is limited with a simple debridement or salina lavage. In 12 knees, debridement is performed with manual curets or knives according to the dimensions of the partial thicknesses. In these 2 groups of patients we didn't use powered instruments and didn't perform a second look arthroscopy as well. The treatment was combined with extensive physiotherapy. In 18 knees debridement is combined with abrasion arthroplasty and perforation (Figur VIII).

In 6 knees, debridement abrasion arthroplasty is combined with internal fixation of the osteochondral fracture (4, 5). In 3 cases Kirschner wires, in 2 cases mini AO screws and in 1 case a Herbert screw is used as a fixation method. In this group, we followed the results with curiosity and on the average in children the stabilization is observed in 6 months time, but in adults the stabilization of the fragments were seen 1 year later in second look arthroscopies.

In all of these cases, the fragments which do not contain a bone block resorbition of the margins of cartilage is debrided in the control arthroscopies. We couldn't see any sign of healing at the marginal parts of the chondral fragments (Figur IX).



Figur VIII: Arthroscopic view of abrasion arthroplasty with powered instruments



Figur IX: Radiologic view of an osteochondral fracture internally fixed by Kirschner wires 1 years postoperatively.

The area of resorbition could be observed

In 4 cases loose bodies were taken out and debridement, abrasion and perforation is performed. In the follow-up over a period of 2 years, fibrocartilagenous tissue was observed at the bed of the loose bodies at the second look arthroscopies. Clinically crepitation was present. Single cartilage injuries are very rare after the injuries of the knee. Wide articular surfaces of the bones and pathology of the lesion expands the scope of the subject. A theme that has such a wide spectrum, classifications and treatment accesses which are made so far are discussed and compared with the current arthroscopic developments.

## References

1. Binnet, MS., Ateş, Y., Işıklar, U: Diz ekleminin kırık ve lezyonlarında Artroskopik Artroplasti ve Artroskopik Dergisi 1: 33-40, 1989.
2. Glinz, W: Arthroscopy in articular cartilage injury, in: Hastings DE (ed). The knee: Ligament and articular cartilage injuries. Springer Verlag, Berlin, Heidelberg, NewYork 95-103, 1978.
3. Gachter, A., Rosetto, M.: Verteilung der relevanz Knorpel schädigung am knie, in: Hofer H (ed). Fortschritte in der arthroscopie: Ferdinand, Enke, Verlag, Stuttgart. 31-6, 1985.
4. Ganz, R.: The isolated shear injury to articular cartilage in: Hastings DE (ed). The knee: Ligament and articular cartilage injuries. Springer verlag, Berlin, Heidelberg, NewYork 113-6, 1978.
5. Morscher, E.: Post traumatic cartilage impression of the femoral condyles. in: Hastings DE (ed). The knee: Ligament and articular cartilage injuries. Springer verlag, Berlin, Heidelberg, NewYork 105-111, 1978.

6. McAndrew, S.: Arthroscopic classification of chondromalacia patella in: Grana A. (ed) Techniques in Orthopaedics. Uptake in arthroscopic techniques. Edward Arnold, NewYork 37-42, 1986.
7. Hungerford, DS. : Patellar subluxation and excessive lateral pressure as a cause of fibrillation, in: Pickett JC, Radin EL (ed). Chondromalacia of the patella. Williams & Wilkings Baltimore/London 24-42, 1983.
8. Goodfellow, MSJ.: Cartilage lesion and chondromalacia, in: Pickett JC, Radin EL (ed). Chondromalacia of the patella. Williams & Wilkings, Baltimore/London 43-48, 1983.
9. Meachim, G.: Cartilage lesions on the patella, in: Pickett JC, Radin EL (ed). Chondromalacia of the patella. Williams & Wilkings, Baltimore/London 1-10, 1983.

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