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Arthroscopic treatment of osteochondritis dissecans of the elbow in adolescents

Ergen kişilerin dirseklerinde osteokondritis dissekansın artroskopik tedavisi

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Objectives: We evaluated the results of arthroscopic management of osteochondritis dissecans (OD) of the elbow in adolescents.

Patients and methods: Seven patients with OD (age range 13 to 20 years) underwent arthroscopic surgery involving removal of the loose bodies followed by multiple drilling with a K-wire. Four patients were professional athletes and three patients enjoyed playing softball. There was pain on exertion in all the patients, accompanied by locking in five patients, joint effusion in two patients, and snap in one patient. The mean articular range of motion was 121° (range 105° to 145°), and the mean flexion contracture was 8°. Radiographic studies showed changes in the capitellum of the humerus and loose bodies within the joint. The results were evaluated using the Broberg and Morrey's scoring system. Medial instability of the elbow was compared with the normal side using the method of Conway et al. The mean follow-up period was 19.7 months (range 16 to 28 months).

Results: According to the Broberg and Morrey's evaluation system, the results were excellent in two patients (28.6%), and good in five patients (71.4%). Normal range of motion was achieved in all the patients and all returned to a normal living within an average of 7.3 days (range 5 to 11 days). The results of treatment were good in four professional athletes, but none could return to their professions. Compared to the healthy side, valgus instability test showed 3 mm difference in two patients and 1 mm difference in one patient, but this did not affect their living.

Conclusion: Arthroscopic surgery of the elbow has proven to be safe and effective in the treatment of loose bodies of the elbow and other associated pathologies.

Key words: Athletic injuries/surgery; elbow joint/injuries/surgery; joint loose bodies/surgery; osteochondritis dissecans/surgery; treatment outcome.

Amaç: Bu çalışmada, ergen kişilerin dirseklerinde gelişen osteokondritis dissekansın artroskopik tedavisinin sonuçları değerlendirildi.

Hastalar ve yöntemler: Osteokondritis dissekanslı yedi hastada (yaş dağılımı 13-20), K-teli ile multipl drilleme işleminden sonra serbest cisimciklerin çıkarılmasını içeren artroskopik tedavi uygulandı. Dört hasta profesyonel sporcu idi; üç hasta ise beysbol oyunu meraklısıydı. Tüm hastalarda egzersizle birlikte ağrı, beş hastada kilitlenme, iki hastada eklem efüzyonu, bir hastada ise çatırdama sesi vardı. Ortalama eklem hareket açıklığı 121° (dağılım 105°-145°), ortalama fleksiyon kontraktürü 8° idi. Radyografik incelemelerde humerus kapitellumunda değişiklikler ve eklem içinde serbest cisimcikler görüldü. Sonuçlar Broberg ve Morrey'in skorlama sistemiyle değerlendirildi. Dirsek medial instabilitesi sağlam tarafla karşılaştırılarak Conway ve ark.nın yöntemine göre değerlendirildi. Hastalar ortalama 19.7 ay (dağılım 16-28 ay) izlendi.

Bulgular: Broberg ve Morrey'in skorlama sistemine göre iki hastada (%28.6) mükemmel, beş hastada (%71.4) iyi sonuç alındı. Tüm hastalar normal hareket açıklığına kavuştu ve tümü ortalama 7.3 günde (dağılım 5-11 gün) normal yaşamlarına döndü. İyi sonuç alınan dört profesyonel sporcunun hiçbiri mesleklerine geri dönemedi. Normal tarafla karşılaştırıldığında, valgus instabilite testinde iki hastada 3 mm, bir hastada 1 mm fark bulundu; ancak bu durum yaşamlarını etkileyecek düzeyde değildi.

Sonuç: Artroskopik cerrahi, dirsekteki serbest cisimlerin ve beraberindeki sorunların tedavisinde güvenli ve etkili bir yöntemdir.

Anahtar sözcükler: Atletik yaralanma/cerrahi; dirsek eklemi/yaralanma/cerrahi; eklem serbest cismi/cerrahi; osteokondritis dissekans/cerrahi; tedavi sonucu.

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Osteochondritis dissecans (OD) of the elbow is a relatively common disease among young athletes involved in throwing activity.[1] Due to frequent misdiagnoses, severe problems may ensue as the disease progresses.

Osteochondritis dissecans is treated with a splint or conservative therapy when there is no displacement. However, in advanced cases, surgical treatment is needed including loose body removal, multiple drilling, articular surface shaving, and fixation of the diseased site.[2-7]

We evaluated the results of arthroscopic removal of loose bodies followed by multiple drilling in patients with OD of the elbow.

PATIENTS AND METHODS

Seven patients with OD with ages ranging from 13 to 20 years were evaluated. Four patients were professional athletes, with three baseball pitchers and a gymnast specialized in floor exercise. The remaining three patients played softball as a favorite hobby. In athletes who were involved in throwing action, OD occurred on the right side (the dominant side) while the left side (nondominant) was affected in the gymnast.

On examination, there was pain on exertion in all the patients, accompanied by locking in five patients, joint effusion in two patients, and snap in one patient. The mean articular range of motion was 121° (range 105° to 145°), and the mean flexion contracture was 8°.

Radiographic studies showed changes in the capitellum of the humerus and loose bodies within the joint. In one patient, the stability of the loose body was evaluated with magnetic resonance imaging (MRI) to determine whether the borderline contained fluid or not.

In the prone position, with the elbow flexed at 90°, the lateral portal was made for viewing in the triangle outlined by the olecranon process, radial head, and lateral epicondyle of the humerus, where a 2.8 mm arthroscope was inserted. After the osteochondral loose body was confirmed, another portal was made 1 cm distal to the lateral portal and the loose body was removed (Fig. 1) followed by multiple drilling using a K-wire. Then the arthroscope was inserted into the proximal medial portal to remove any remaining loose bodies (Fig. 2).

The mean follow-up period was 19.7 months (range 16 to 28 months). The results were evaluated using the Broberg and Morrey's[8] scoring system. Medial instability of the elbow was compared with the normal side on radiographies using the method described by Conway et al.[2]

RESULTS

According to the Broberg and Morrey's[8] evaluation method, the results were excellent in two patients (28.6%), and good in five patients (71.4%). Normal range of motion was achieved in all the patients and all returned to a normal life within an average of 7.3 days (range 5 to 11 days). The results of treatment were good in four professional athletes, but none could return to their professions. Compared to the healthy side, valgus instability test showed 3 mm difference in two patients and 1

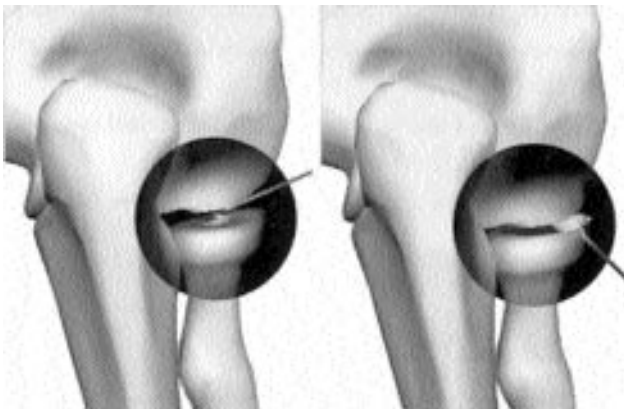

Fig. 1. Illustration showing the loose osteochondral fragment.

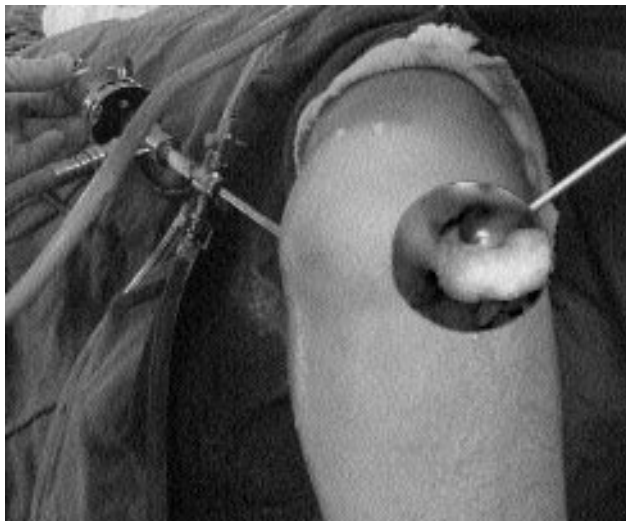

Fig. 2. Removal of the loose body with forceps.

mm difference in one patient, but this did not affect the maintenance of a normal life.

DISCUSSION

Osteochondritis dissecans of the elbow is common in young athletes, making it impossible for teenager athletes to throw the ball without pain. Even with many treatment methods, the results have been unsatisfactory.[1,9] The predominant hypothetical pathophysiology of the disease is that it is caused by repetitive trauma under poor blood supply, especially when the hard radial head conducts compression and shearing forces to the relatively smooth capitellum of the humerus.[10,11]

The most common symptom is pain, which is aggravated by activity and relieved by rest. Restriction of elbow movement may develop, as well. According to Peterson et al.[4] extension limitation of 5°-10° usually develops. In our study, extension restriction was seen in six patients. Schenck and Goodnight[12] reported that, in the late stages, an irregular articular surface, localized destructive lesions, cystic changes, and relative hypertrophy of the radial head can be seen on anteroposterior radiographs, and flattening of the capitellum on lateral radiographs. In addition, loose bodies can be seen when osteochondral fragment is detached into the intra-articular cavity and degenerative changes can be seen in the late stage. When computed tomography is performed at this stage, the lesion can be easily observed in the subchondral bone. In this study, all the cases were in the late stage with already formed loose bodies.[4] A localized destructive lesion and relative hypertrophy of the radial head were found on anteroposterior radiograms.

For early diagnosis, Takahara et al.[13] attached great importance to ultrasonography and MRI, whereas Rosenberg et al.[14] reported that, despite the advantage of MRI to evaluate the extent of exfoliation or the stability of the osteochondral fragment, the presence of pseudodefects might be misleading, giving the appearance of an osteochondral defect. In this study, MRI was performed in only one patient and was helpful in the evaluation of the extent of exfoliation.

Treatment of OD differs depending on the disease stage. Before loose bodies appear on the articular surface, it can be treated conservatively with restriction of motion, splint, braces, and nonsteroidal anti-inflammatory drugs; however, when loose bodies are formed and symptoms appear surgical treatment is recommended.[7,13] Surgery is indicated when symptoms persist or aggravate even with sufficient conservative treatment, when loose body-associated symptoms appear, when fracture is detected in the articular cartilage, and when dislocation or exfoliation of the articular cartilage develops.[12,14] Surgery may involve either excision or fixation of the osteochondral fragment. Surgeons usually prefer excision of unstable or loose osteochondral fragments.

In recent decades, arthroscopic surgery of the elbow is also a well-established technique and has proven to be safe and effective in the treatment of loose bodies of the elbow and other associated pathologies.[3,5,15,16] This is recommended as the most reliable method to evaluate the state of the anteroposterior articulation and to confirm the lesion site. In our patients, displaced loose bodies caused considerable restriction in articular motion. With arthroscopic removal and multiple drilling, all the patients could return to their daily lives within an average of 7.3 days (range 5 to 11 days), with satisfactory results.

In conclusion, compared to open surgery, arthroscopy is considered to be an excellent means of observing anterior and posterior articular lesions simultaneously and removing loose bodies, with an additional advantage of early rehabilitation.

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