



Results of Conservative Treatment of First Time Acute Lateral Patella Dislocation

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ABSTRACT

Objective: Acute patellar dislocations account for 2–3% of all knee injuries. Patients with first-time acute lateral patellar dislocations can be conservatively treated. This study aimed to evaluate the conservative treatment method and clinical outcomes in these patients.

Methods: Between 2013 and 2016, patients with traumatic first-time acute patellar dislocation were retrospectively evaluated. Clinically, patients with positive knee joint medial retinaculum tenderness, joint effusion, and positive patellar scaring test results were evaluated. The diagnosis of these patients was supported using direct anteroposterior and lateral knee radiographs and magnetic resonance imaging. The patients' visual pain scale evaluations were performed before and after treatment. Kujala functional assessment scoring was performed only after treatment. Wilcoxon statistical analysis was used to evaluate dependent groups.

Results: The mean follow-up period of the patients was 13 months (range, 7–34 months). Three patients were female and 12 were male. Fifteen patient's mean preoperative VAS (Görsel Ağrı Skoru) scores were 8.6 points (range, 7–10), and 1.4 points (range, 0–3) after treatment. The decrease in VAS score was statistically significant ($p < 0.05$). The Kujala score was 87.2 (range, 80–96) in the final evaluations. According to this score, 5 patients were rates as excellent and 10 as good and there were no patients who were worse.

Conclusion: The most important aspect of this study is the observation that conservative treatment can achieve good functional outcomes for MPFL tears from bone adherence sites during first-time traumatic patellar dislocation. We conclude that conservative treatment can provide a successful outcome when appropriate patient selection is done.

Keywords: Medial patellofemoral ligament, patellar dislocation, treatment of acute patellar dislocation

INTRODUCTION

Acute patellar dislocations constitute 2%–3% of all knee injuries (1). They can be seen with some predisposing conditions such as trochlear dysplasia, patella alta, and extremity alignment disorder, or they can be encountered in normal patellofemoral joint after serious traumas (2).

Medial patellofemoral ligament (MPFL) extends from between the medial margin of the patella to the point between the adductor tubercle and medial epicondyle in the femur (3). It is thought that this ligament provides 50%–60% resistance to lateral dislocation (4, 5). After lateral patellar dislocation, MPFL is often ruptured. This rupture can be total or partial, and its diagnosis is established with the help of magnetic resonance imaging (MRI) (6, 7).

If there is no osteochondral fracture, conservative treatment can be applied after the first patellar dislocations (8, 9). Conservative treatment is mostly begun with brace or plaster cast and completed with exercises, particularly for strengthening the quadriceps muscle (10, 11). The aim of this study is to evaluate the clinical results of conservative treatment in patients having lateral patellar dislocation for the first time.

METHODS

The patients diagnosed with traumatic lateral patellar dislocation for the first time between the years 2013 and 2016 were evaluated. The informed consents of the patients were received for the study. The study was performed in accordance with the ethical principles for medical research involving human subjects stated in the Declaration of Helsinki developed by the World Medical Association. In clinical examination, all patients had the anamnesis of lateral patellar dislocation. They had tenderness in the medial retinaculum on palpation, effusion in the joint, and positive patellar apprehension test result. Anterior-posterior and lateral direct radiographies of the knee joint were evaluated in all patients (Figure 1a, b). Routine MRI was performed to investigate the presence of chondral or osteochondral lesion, to view MPFL rupture, and to understand whether rupture developed in the point of bone adhesion or any point in the ligament (Figure 2). The patients with a history of injury shorter than 3 weeks, the first lateral patellar dislocation, dislocation in a single extremity, and diagnosis of MPFL rupture from the areas of bone adhesion through MRI were included in the study. On the other hand, the patients having a history of two or more patellar dislocations, chondral or osteochondral fragment in the joint revealed through MRI, patellar alta or trochlear dysplasia revealed through



radiological evaluation, and dislocation in the contralateral knee were excluded from the study.

MRI reports were evaluated by a radiologist experienced in musculoskeletal system radiology and having an achievement certificate from the Turkish Radiology Proficiency Exam. Moreover, direct radiographs and MRIs were also evaluated by two experienced orthopedic surgeons dealing with sports traumatology.

Statistical Analysis

For statistical analysis, the Wilcoxon test, which is a non-parametric test in dependent groups, was used. The value of $p < 0.05$ was considered significant.

Conservative Treatment

The patellae of all patients were spontaneously reduced at the time of admission. Aspiration of hematoma was performed for the patients with high effusion, and an appropriate-sized knee brace that supported the patella from the lateral to the medial

regions were placed in all patients. This knee brace included a pad for supporting the patella from the lateral to the medial (Figure 3). Knee flexion was forbidden for 6 weeks for the patients. Weight bearing was allowed at a tolerable level provided that the knee joint was in the position of full extension. At the end of this period, passive and active flexion-extension exercises were begun to provide knee range of motion for 2 weeks. Isometric quadriceps-strengthening and straight leg raise exercises were simultaneously initiated. Next, brace was removed and quadriceps-strengthening exercises were performed, giving particular importance to the vastus medialis muscle. During the same period, hamstring-stretching exercises were added to the program. At the end of the 6-month period, the patients with negative patellar apprehension test, no pain on the medial retinaculum on palpation, and full range of motion were evaluated to be recovered. Subsequently, functional measurement was performed using Kujala patellofemoral joint scoring. The score of 95 and above was evaluated as excellent, 85–94 as good, 65–84 as poor, and 64 and below as very poor. Pain levels of all patients were measured with Visual Analogue Scale (VAS).

RESULTS

The mean duration of follow-up was 13 months (range: 7–34 months). Of the patients, 3 were female and 12 were male. Of 20 patients, 1 patient was excluded from the study because of trochlear dysplasia, 1 patient because of patella alta, and 3 patients because of chondral-osteochondral fragment in the joint. MRI evaluation revealed that all ruptures were at the places of bone adhesion. In other 15 patients, while the mean VAS score was 8.6 (range: 7–10) before treatment, it was 1.4 (range: 0–3) after treatment. Decrease in the VAS score was statistically significant ($p = 0.001$). The mean Kujala score was 87.2 (range: 80–96)

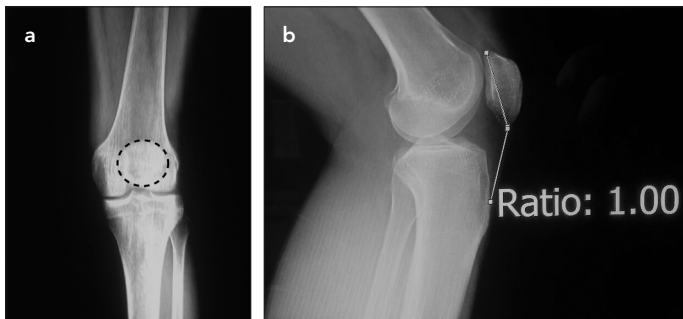


Figure 1. a, b. (a) After previous patellar dislocation, AP direct radiography view (yellow lines: projection of the patellar margin). (b) After previous patellar dislocation, lateral direct radiography view. AP: acute patellar

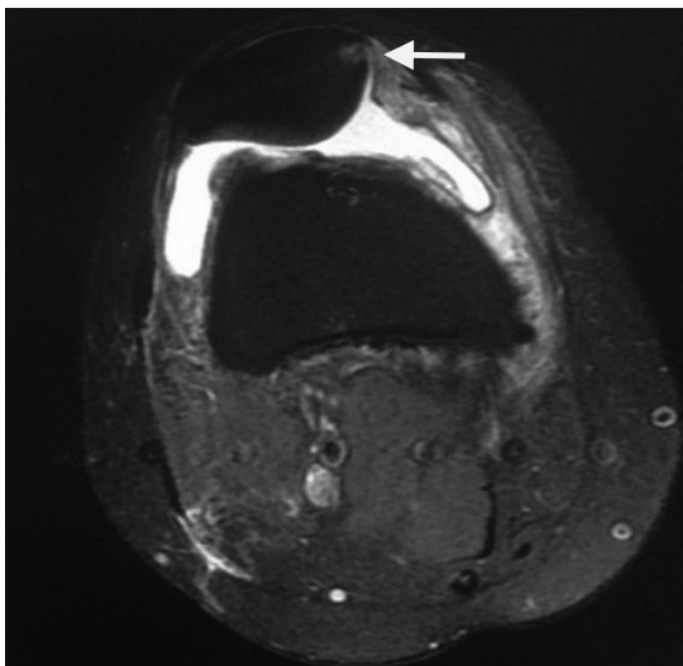


Figure 2. After previous acute patellar dislocation, axial MRI evaluation of MPFL injury from the place of patellar adhesion (yellow arrow). MPFL: medial patellofemoral ligament; MRI: magnetic resonance imaging

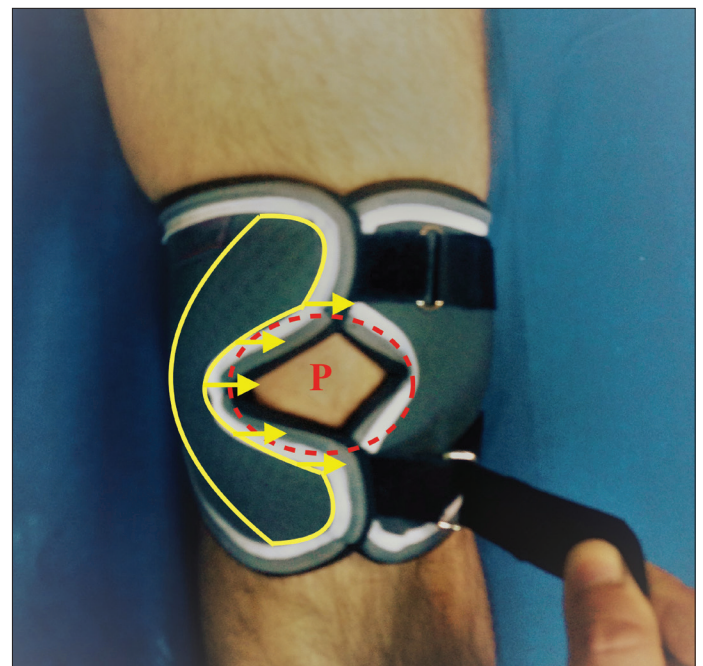


Figure 3. After the procedure, anterior-posterior view of knee brace with lateral patellar support. Yellow lines: lateral support; red dashed line: projection of the patellar margins; the patella is supported from the lateral in the direction of yellow arrows; P: Patella

in the last evaluations of the patients. The results of scoring were excellent for 5 patients, good for 10 patients, and poor and very poor for none. In one patient, a superficial skin wound developed under the brace in the 2nd week. In this patient, the brace was loosened enough not to allow the patella to slide to the lateral region. The wound was treated with simultaneously applied topical antibiotic and moisturizing cream.

DISCUSSION

The most important aspect of this study is that it has demonstrated that successful functional results can be obtained in the conservative treatment of MPFL ruptures developing from the places of bone adhesion during the first traumatic patellar dislocation. It is known that healing capacity of injuries due to ruptures of ligament structures from the bone adhesion is higher than the injuries occurring in any other point on the ligament (12). In a recent study investigating healing potentials according to the anatomic localization of MPFL rupture after the first patellar dislocation, it was reported that good results after conservative treatment were obtained only for MPFL ruptures in the place of adhesion to the patella. The detection of the localization of MPFL rupture has been the subject of many studies, and it remains to be controversial at present (13, 14). We suggest that further studies with higher evidence level are needed on this topic.

While some studies recommend surgical treatment after the first patellar dislocation, some recommend conservative treatment (15-17). Because the evidence in the literature is unsatisfying, no optimal treatment choice is available for this issue (18). Complexity of patellofemoral instability can make the decision of treatment more difficult. In the study, successful functional results after conservative treatment were obtained in cases without accompanying osteochondral-chondral fragment and patellafemoral development anomaly. In the randomized-controlled study of Palmu et al. (19), in which they compared surgical and conservative treatment methods after acute patellar dislocation, although they found higher recurrence rate after conservative treatment, they reported no significant functional difference between the two groups, and they stated that conservative treatment could be successful with the selection of appropriate patients. Similarly, Buchner et al. (3) reported that the development of recurrence had no negative effect on clinical outcomes, and they concluded that these patients could perform their daily activities easily. In our study, good functional results were attributed to the fact that this treatment was preferred for the patients with no accompanying predisposing disorders, such as patella alta and trochlear dysplasia.

Cheng et al. (20) examined seven randomized prospective studies in their recent review, in which they evaluated functional results of conservative treatment and surgical treatment for first acute patellar dislocation and recurrence rates. They found that while recurrence rates were higher after conservative treatment, functional scores were better. In our study, functional results were found to be satisfying and no recurrence was observed in any patient during follow-up. Half of recurrences after acute patellar dislocation have been reported to be seen after 2 years (21). Similarly, Harilainen and Sandelin (22) reported 2% recurrence in the first 1 year, but they stated that the recurrence rate increased

to 17% at 6.5-year follow-up. In our study, no recurrence can be explained because of inadequate length of follow-up.

In this study, early mobilization was not applied for complete soft tissue healing. While rigid stabilization and slow rehabilitation were recommended previously (23, 24), earlier and more rapid rehabilitation is recommended at present (25). The negative effects of immobilization on the bone, cartilage, ligament, and muscle have been demonstrated (26). On the other hand, early mobilization can be useful in decreasing pain and strengthening the quadriceps muscle. Jarvinen also demonstrated that brace could support the lateral patella and provide alignment and that more rapid rehabilitation could be obtained when mobilization of the joint was allowed (25). On the other hand, biomechanical studies revealed that tension of MPFL during the first 20° of knee flexion was at maximum level. Therefore, early mobilization was not applied in the patients, but weight bearing was allowed at tolerable level in full extension. In addition, isometric quadriceps exercises were simultaneously performed. A significant decrease was detected in the VAS scores of all patients after treatment. No active or passive restriction occurred in the movement arc in any patient.

A previous study reported that recurrence rates were higher in female patients than in male patients (22). There is no explanatory information about this higher rate in women (3). In our study, the number of female patients was not enough to make a comparison, but no recurrence was observed in the three female patients. We suggest that further studies with higher evidence level should be conducted on this issue.

The limitations of this study are retrospective design of the study, low number of patients, and the absence of a control group. Besides that, the number of studies evaluating conservative treatment administered after the first patellar dislocation and its results is restricted. Moreover, the selection of patients without patellofemoral development anomaly among those diagnosed with this dislocation increased the homogeneity of this study, which is a non-negligible advantage.

CONCLUSION

In conclusion, we suggest that conservative treatment can provide a successful result if appropriate selection is done in patients diagnosed with lateral patellar dislocation for the first time. On the other hand, in the conservative treatment of first dislocation cases having patellofemoral development anomaly, further studies with high evidence level are needed for demonstrating the effects of anomalies on recurrence rates and functional outcomes.

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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