

# Clinical and diagnostic outcomes in arthroscopic treatment for posterolateral plicae impingement within the radiocapitellar joint

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## Abstract

Synovial plica is rarely diagnosed as cause of elbow pain. Impingement of posterolateral plicae in the radiocapitellar joint tends to be usually overlooked. The purpose of this study was to present outcomes of arthroscopic treatment in relatively large number of cases and propose reliable diagnostic test for posterolateral plicae of the radiocapitellar joint.

From January 2000 to December 2010, 24 cases diagnosed with pathologic posterolateral radiocapitellar plica on arthroscopic finding were retrospectively reviewed. Magnetic resonance imaging (MRI) evaluation and preoperative physical examination were performed. The posterolateral radiocapitellar plica test newly proposed by the present study was also conducted. To measure postoperative clinical outcomes, the disabilities of the arm, shoulder, and hand (DASH) score and Mayo elbow performance score (MEPS) were employed. Minimum duration of follow up was 24 months.

According to the preoperative MRI, pathologic radiocapitellar plica was identified in 17 cases (70.8%). Preoperatively, maximal tender point was present on the radiocapitellar joint line in 20 cases (83.3%) and mechanical symptoms were observed in 9 cases (37.5%). 6 cases (25%) demonstrated pain at terminal extension and limitation of extension. 20 (83.3%) cases tested positive for posterolateral radiocapitellar plica test. The sensitivity and specificity of the posterolateral radiocapitellar plica test were 83.3% and 87.5%, respectively. The accuracy value was 86.3%. Arthroscopic debridement of pathologic plica in the radiocapitellar joint demonstrated clinical improvements: DASH score was from 36.6 to 8.9 and MEPS was from 56.9 to 95.6 at the latest follow-up.

Symptomatic impingement by the pathologic posterolateral plica of the radiocapitellar joint should be considered when posterolateral elbow pain which is refractory to conservative treatment, and other prevalent diseases are excluded. The posterolateral radiocapitellar plica test and radiocapitellar joint line tenderness could be recommended as reliable examination maneuvers to obtain accurate diagnosis. Arthroscopic debridement was an effective method for treating symptomatic plicae.

**Abbreviations:** DASH = disabilities of the arm, shoulder, and hand, MEPS = Mayo elbow performance score, MRI = magnetic resonance imaging.

**Keywords:** arthroscopy, chondromalacia, elbow, impingement, plica, radiocapitellar joint

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## 1. Introduction

Synovial plica is a remnant of the embryonic septae. These are recognized as normal structures formed during development.<sup>[1,2]</sup> Impingement of hypertrophic and inflamed synovial plica is a well-known disease entity in the knee.<sup>[3-5]</sup> However, synovial plica is rarely known to be a cause of elbow pain and it is not a common pathologic finding in the elbow. Impingement of posterolateral plicae in the radiocapitellar joint is usually overlooked and can be mistaken for other common diseases such as lateral epicondylitis.<sup>[6-8]</sup> Only a few studies of case series including small number of patients regarding radiocapitellar plicae have been reported previously.<sup>[6,9,10]</sup> According to these previous studies, triggering mechanical symptom such as catching caused by the thickened and inflamed synovial plicae of elbow was reported to be the most reproducible findings for diagnosis of radiocapitellar plicae. However, there is still a lack of an examination maneuver producing an accurate diagnosis and consequently, it is still troublesome to diagnose plicae of the elbow accurately. The purpose of this study was to present the outcomes of arthroscopic treatment in relatively large number of cases and propose a reliable diagnostic test for posterolateral plicae of the radiocapitellar joint. It was hypothesized that clinical outcomes including symptoms and function would be significantly improved after arthroscopic treatment, and that accurate

preoperative diagnosis of the posterolateral plica in radiocapitellar joint could be made with a more reliable diagnostic test.

## 2. Materials and methods

### 2.1. Patients

The medical records of 240 cases treated with arthroscopic management for elbow pain between January 2000 and December 2010 were retrospectively reviewed after institutional review board approval. Patients who met the following criteria were included:

- (1) no arthritis involving bone change;
- (2) no loose body;
- (3) no elbow instability with negative pivot shift test;
- (4) no previous surgery on the ipsilateral upper extremity;
- (5) minimum duration of follow up of 24 months.

Exclusion criteria were

- (1) additional arthroscopic finding other than synovitis and chondromalacia related to plica on the radial head and capitellum;
- (2) radiologic or arthroscopic evidence demonstrating lateral epicondylitis.

After applying these inclusion and exclusion criteria, patient group who was the main subject of the present study consisted of the patients diagnosed with the pathologic posterolateral plicae in the radiocapitellar joint based on arthroscopic finding. Four cases who met the inclusion criteria were lost to follow-up. Accordingly, 24 cases were included in this study as the posterolateral radiocapitellar plicae patient group. Clinical findings of patients included in the posterolateral radiocapitellar plica patient group were listed in the table of supplemental content, <http://links.lww.com/MD/C950>. Before the patients were referred to our clinic, no one was diagnosed with posterolateral radiocapitellar plica. Previous diagnosis was lateral epicondylitis in 20 cases (83.3%), osteochondritis dissecans of capitellum in 1 case (4.2%), loose body in 1 case (4.2%), synovitis in 1 case (4.2%), and synovitis with loose body in 1 case (4.2%) (see Table, Supplemental Content, <http://links.lww.com/MD/C950>, which illustrates clinical finding of each patient diagnosed with the posterolateral radiocapitellar plicae patient group).

All patients underwent magnetic resonance imaging (MRI) examination of the elbow joint. At MR imaging, synovial plica can be seen as a band of low signal intensity within the high signal intensity of joint fluid. Fat-suppressed T2-weighted image is one of the most valuable MR images for diagnosis of plicae. Synovial fold of more than 3 mm in thickness measured at coronal and sagittal images was interpreted to be a pathologic plica as an abnormal finding.<sup>[11–13]</sup> The MR images were reviewed and interpreted by an experienced musculoskeletal radiologist in the present study.

Physical examinations including joint line tenderness, range of motion, and mechanical symptoms such as snapping and catching were performed. Additionally, we have developed a new examination maneuver for the diagnosis of the posterolateral radiocapitellar plica referred to as the posterolateral radiocapitellar plica test. In order to analyze the reliability of this preoperative diagnostic test for the impingement of posterolateral plicae in the radiocapitellar joint, another patient

group was organized including 56 cases treated with elbow arthroscopy for lateral epicondylitis. These patients met the abovementioned inclusion criteria, but absence of pathologic posterolateral plica at the radiocapitellar joint was confirmed through arthroscopy.

### 2.2. Posterolateral radiocapitellar plica test

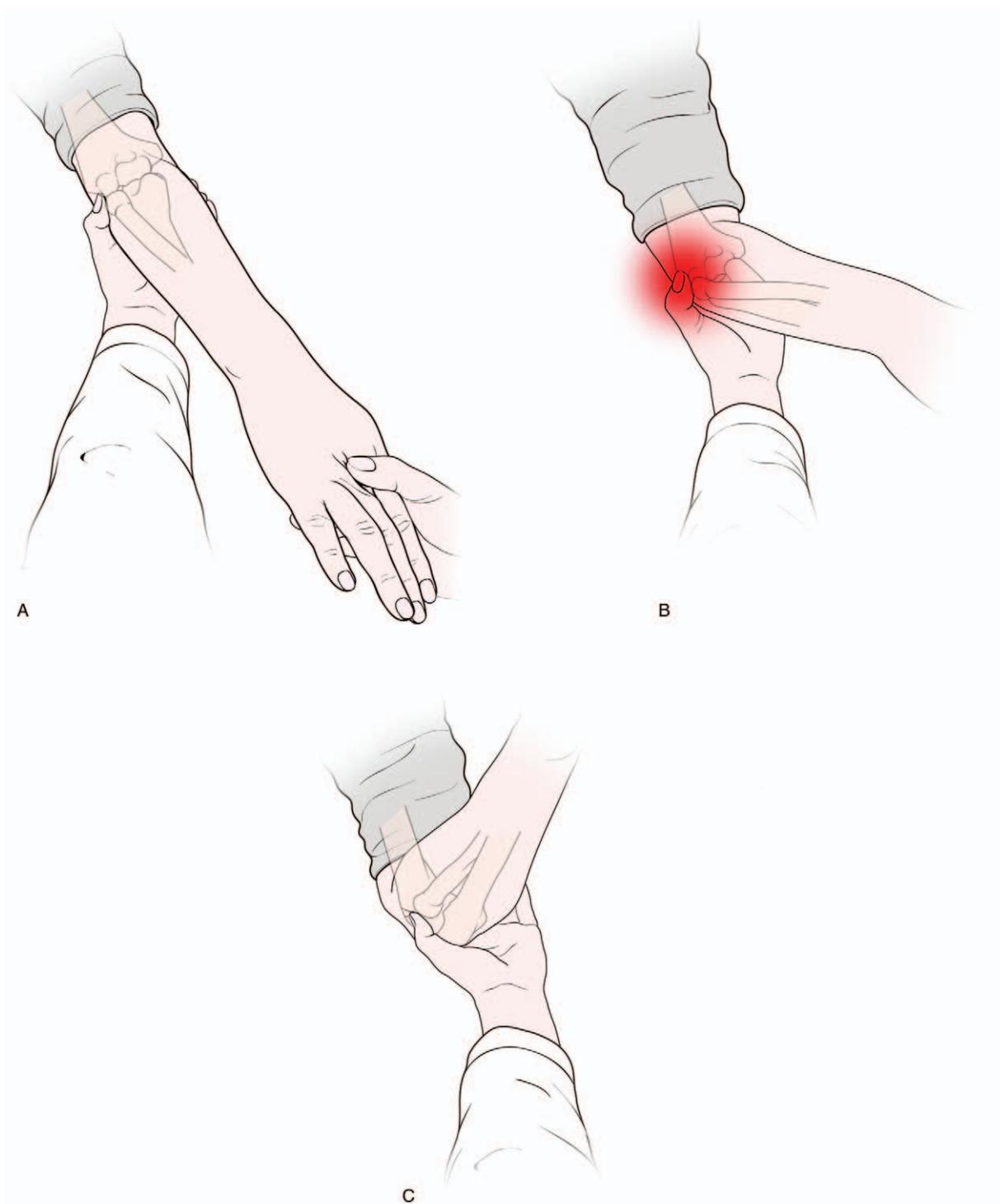
The procedure of the posterolateral radiocapitellar plica test is as follows (Fig. 1). The test is conducted while an examiner places 1 hand's thumb at the posterolateral aspect of radiocapitellar joint and turns the patient's forearm into a pronated position grasping a wrist with the examiner's another hand. The starting position of the test is an extended position of elbow. While applying manual force to the posterolateral aspect of radiocapitellar joint, the examiner checks the presence of tenderness. And then the examiner bends the patient's elbow into a flexed position while applying a manual force to the posterolateral aspect of radiocapitellar joint. If the tenderness at the radiocapitellar joint which occurs at low flexion angle is markedly diminished at more than 90° of flexion with maintaining manual compression force, the test is counted as "positive." The posterolateral plica is located between radiocapitellar joint in the extended elbow position. When manual force is applied to the posterolateral aspect of the radiocapitellar joint, the pathologic plica is inserted and squeezed between radiocapitellar joint. Accordingly, tenderness at the radiocapitellar joint occurs. However, when flexion angle of elbow increases, the entrapped plica slips away from the radiocapitellar joint at more than 90° of flexion even with maintaining manual compression force. Therefore, the tenderness at the radiocapitellar joint is markedly diminished.

### 2.3. Operative procedures

All surgical procedures were performed by the senior author. The patients were placed in the prone position with the affected arm supported over a padded bolster. The procedure was performed under inflated tourniquet. The transarticular approach was used for initial entry of the 2.7 mm diameter arthroscope.<sup>[14]</sup> The entry point for the transarticular approach was at the intersection of a horizontal line drawn from the radiocapitellar joint to the olecranon, with a sagittal line drawn just lateral to the olecranon (Fig. 2). The proximal anteromedial portal was created viewing from the transarticular portal, and anterior compartment of the joint was examined. Then the lateral and posterior compartments were inspected with the posterolateral portal and straight posterior portal. Using posterolateral portal, thickened plica was excised and debrided with a basket punch and shaver. If there were any other pathologic findings of synovitis and chondromalacia, additional debridement was performed (Fig. 3 and see Video, Supplemental Video, <http://links.lww.com/MD/C949>, which demonstrates arthroscopic treatment for posterolateral plicae in the radiocapitellar joint).

### 2.4. Clinical assessments

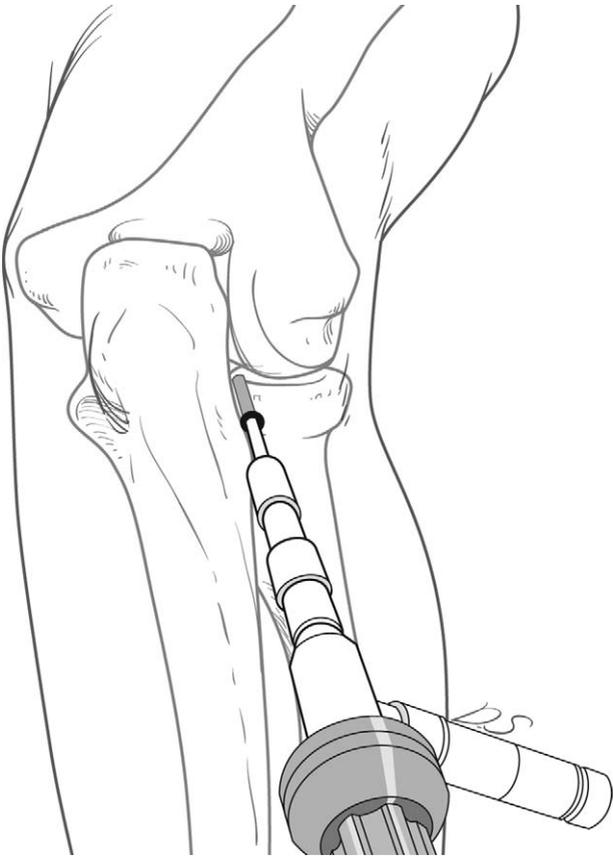
Postoperative follow-up examinations after surgery were done at 3 months, 6 months and then annually. The preoperative values and the follow-up values measured at minimum 2 years after surgery were assessed. Abovementioned physical examinations including joint line tenderness, mechanical symptom, range of motion, and the posterolateral radiocapitellar plica test were



**Figure 1.** The procedure of the posterolateral radiocapitellar plica test. (A) The starting position of the test is an extended position of elbow, while an examiner places one hand's thumb at the posterolateral aspect of radiocapitellar joint and turns the patient's forearm into a pronated position grasping a wrist with the examiner's another hand. (B) The examiner bends the patient's elbow into a flexed position while applying a manual force to the posterolateral aspect of radiocapitellar joint. The examiner checks the presence of tenderness. (C) If the tenderness at the radiocapitellar joint which occurs at low flexion angle is markedly diminished at more than 90° of flexion with maintaining manual compression force, the test is counted as "positive."

performed preoperatively and postoperatively. Subjective pain level and elbow function were investigated. The disabilities of the arm, shoulder, and hand (DASH) questionnaire<sup>[15]</sup> and Mayo elbow performance score (MEPS)<sup>[16]</sup> were used to evaluate elbow

function. The DASH score system is composed of 30 questions and self-report questionnaire designed to measure physical function and symptoms. The DASH score ranges between 0 and 100 points. A lower score correlates to a better function of



**Figure 2.** The entry point for the transarticular approach is at the intersection of a horizontal line drawn from the radiocapitellar joint to the olecranon, with a sagittal line drawn just lateral to the olecranon.

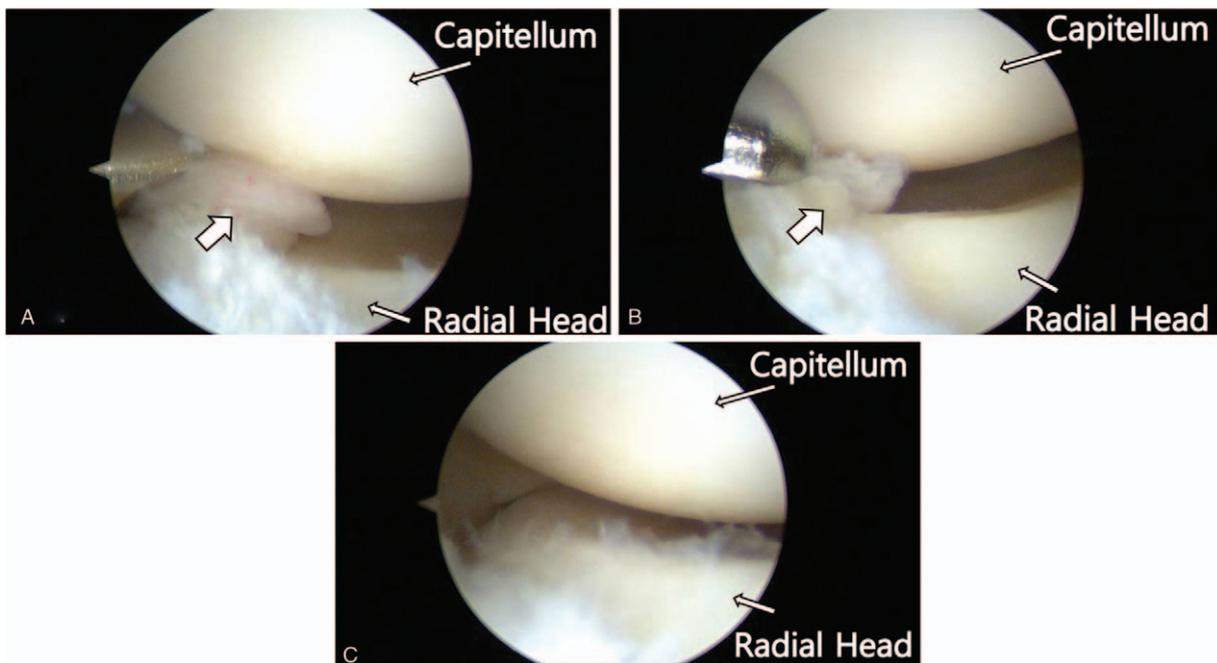
the upper extremity of patients. Postoperative change of more than 15 points means that an actual change in function and symptoms has occurred.<sup>[17]</sup> MEPS is composed of four criteria for measurement of elbow performance. It ranges from 0 to 100 points. Ninety points or more indicate excellent, 75 to 89 points indicate good, 60 to 74 points indicate fair, and less than 60 points indicate poor performance status.

### 2.5. Statistical analysis

Continuous variables were tested for normality using Shapiro–Wilk test. To compare the demographic data between the groups. The independent-samples *t* test or the Mann–Whitney *U* test was employed for continuous variables and the chi-square test or the Fisher exact test was used for categorical variables. Comparison between preoperative and postoperative values regarding DASH score and MEPS was performed using the paired *t* test or the Wilcoxon signed rank test. The McNemar test was used to determine if there were differences on a dichotomous dependent variable between preoperative and postoperative values. Diagnostic values were calculated with sensitivity, specificity, positive predictive and negative predictive values. All statistical analysis was done with SPSS software (version 23.0; IBM). The level of significance was set at  $P < .05$ .

### 3. Results

Demographic data of the patient group with radiocapitellar plica and the patient group with lateral epicondylitis for analysis of the reliability of the posterolateral radiocapitellar plica test were listed in the Table 1. In group consisting of patients with radiocapitellar plica, there were 18 men (75.0%) and 6 women (25.0%). Mean age was 44.0 years (range, 15–62 years). Thirteen cases (54.2%) were on the dominant side and 11 cases (45.8%)



**Figure 3.** Arthroscopic images of impingement by the posterolateral plica on the radiocapitellar joint. (A) Thickened and inflamed synovial plica (arrow). (B) Arthroscopic debridement of the plica. (C) Radiocapitellar joint after arthroscopic excision.

**Table 1**  
**Demographic data of the patient group with radiocapitellar plica and the patient group with lateral epicondylitis.**

Variable	Patient group with radiocapitellar plica (n=24)	Patient group with lateral epicondylitis (n=56)	P-value
Sex*			
Male	18 (75.0%)	33 (58.9%)	.210
Female	6 (25.0%)	23 (41.1%)	
Age, yr†	44.0±10.4 (15–62)	40.1±9.7 (19–58)	.224
Side*			
Dominant side	13 (54.2%)	35 (62.5%)	.619
Nondominant side	11 (45.8%)	21 (37.5%)	
Duration of symptom, mo†	19.8±14.5 (2–52)	15.2±14.9 (3–72)	.212
Trauma history*			
Yes	3 (12.5%)	10 (17.9%)	.745
No	21 (87.5%)	46 (82.1%)	

\*The values are given as n (%).

†The values are given as mean±standard deviation.

were on the nondominant side. The average duration from onset of symptom to operation was 19.8 months (range, 2–52 months). Three of 24 cases (12.5%) had traumatic events: 2 patients had direct trauma to elbow and 1 patient had a hyperextension injury. According to the interpretation of preoperative MR images by radiologist, the thickened radiocapitellar plica was identified in 17 cases (70.8%) (Fig. 4), but only synovial proliferation at the posterolateral aspect of elbow joint was identified in other 7 cases (29.2%).

### 3.1. Arthroscopic findings

The thickened plicae and inflamed synovial villi were arthroscopically confirmed in the radiocapitellar joint in all patients of the posterolateral radiocapitellar plica patient group (Fig. 3). Plica was seen to wrap over the radial head and move in and out of the joint during elbow motion. In the extended elbow position, the posterolateral plica is located between radiocapitellar joint.

When manual force is applied to the posterolateral aspect of the radiocapitellar joint, the plica is inserted and squeezed between radiocapitellar joint. However, when flexion angle of elbow increases, the entrapped plica slips away from radiocapitellar joint at more than 90° of flexion even with maintaining manual compression force. As additional findings, 9 cases (37.5%) had associated synovitis around the radiocapitellar joint. Three cases (12.5%) had chondromalacia on the radial head and 1 case (4.2%) had chondromalacia on the capitellum. Three cases (12.5%) had chondromalacia on both the radial head and capitellum.

### 3.2. Clinical assessment

Preoperatively, mechanical symptoms such as snapping and catching were present in 9 cases (37.5%) of the posterolateral radiocapitellar plica patient group. Six cases (25%) demonstrated pain at terminal extension and limitation of extension ranging



**Figure 4.** Appearance of pathologic hypertrophic posterolateral plica of the radiocapitellar joint on MR images. (A) Coronal T2-fat suppressed MR image and (B) Sagittal T2-fat suppressed MR image demonstrating thickened posterolateral plica impinged on the radiocapitellar joint. MR = magnetic resonance.

**Table 2**  
Comparison of clinical findings between preoperative value and postoperative value at the last follow up.

Variable	Preoperative value	Postoperative value	P-value
Joint line tenderness*			<.001
Yes	20 (83.3%)	1 (4.2%)	
No	4 (16.7%)	23 (95.8%)	
Mechanical symptom*			.008
Yes	9 (37.5%)	1 (4.2%)	
No	15 (62.5%)	23 (95.8%)	
Limitation of extension*			.125
Yes	6 (25.0%)	2 (8.3%)	
No	18 (75.0%)	22 (91.7%)	
Posterolateral radiocapitellar plica test*			<.001
Yes	20 (83.3%)	0 (0%)	
No	4 (16.7%)	24 (100%)	
DASH score†	36.6±4.3	8.9±4.8	<.001
MEPS‡	56.9±7.2	95.6±7.0	<.001

DASH=the disabilities of the arm, shoulder, and hand, MEPS=Mayo elbow performance score.

\* The values are given as n (%).

† The values are given as mean±standard deviation.

from 12° to 20°. Twenty cases (83.3%) had joint line tenderness and the maximal tender point was located at the posterolateral aspect of the elbow corresponding with the radiocapitellar joint in the extended elbow position. In terms of the posterolateral radiocapitellar plica test, 20 cases (83.3%) of 24 cases diagnosed with posterolateral radiocapitellar plica tested positive (Table 2). Whereas only 7 cases (12.5%) of 56 cases diagnosed with lateral epicondylitis tested positive. The sensitivity and specificity of the posterolateral radiocapitellar plica test were 83.3% (95% confidence interval=62.6%–95.3%) and 87.5% (95% confidence interval=75.9%–94.8%), respectively. The positive and negative predictive values were 74.1% (95% confidence interval=58.3%–85.4%) and 92.5% (95% confidence interval=83.3%–96.8%), respectively. The accuracy value was 86.3% (95% confidence interval=76.7%–92.9%) (Table 3).

In patients of the posterolateral radiocapitellar plica patient group, preoperative DASH score averaged 36.6 (range of 27.5–47.5 points). The mean DASH score at 3 months postoperatively was 10.1 (range of 2.5–21.6 points). The mean postoperative DASH score was 8.9 (range of 0–18.3 points) at the last follow up. The differences between preoperative value and both of postoperative values at 3 months and the last follow up were statistically significant ( $P<.001$ ) (Table 2). The difference

**Table 3**  
Evaluation of the posterolateral radiocapitellar plica test in diagnosing impingement of the pathologic posterolateral plica in the radiocapitellar joint.

Number of elbows	Pathologic Plica (+)	Pathologic Plica (–)	Total
Test (+)	20	7	27
Test (–)	4	49	53
Total	24	56	80

Sensitivity=83.3% (20/24) (95% confidence interval=62.6%–95.3%).

Specificity=87.5% (49/56) (95% confidence interval=75.9%–94.8%).

Positive predictive value=74.1% (20/27) (95% confidence interval=58.3%–85.4%).

Negative predictive value=92.5% (49/53) (95% confidence interval=83.3%–96.8%).

Accuracy value=86.3% (69/80) (95% confidence interval=76.7%–92.9%).

between the mean preoperative DASH score and postoperative DASH score at the last follow up was 27.7. The difference was more than the minimal clinically important difference (MCID), which is the minimal difference in functional score before and after treatment that clinically reflects changes that are significant for patients. The MCID of the DASH score was reported as 10.83 in a previous study.<sup>[18]</sup> Preoperatively MEPS averaged 56.9 points with a range of 50 to 70 points. The mean MEPS at 3 months postoperatively was 93.1 (range of 85–100 points). The mean postoperative MEPS was 95.6 points with a range of 85 to 100 points at the last follow up. The differences between preoperative value and both of postoperative values at 3 months and the last follow up were statistically significant ( $P<.001$ ) (Table 2). Seventeen cases (70.8%) had an excellent outcome with more than 90 points postoperatively at the last follow up. Seven cases (29.2%) had a good outcome with 85 points. The difference between the mean preoperative MEPS and postoperative MEPS at the last follow up was 38.7. The difference was also more than the MCID of the MEPS, which was reported as 15.0.<sup>[19]</sup>

Intermittent snapping remained postoperatively in only 1 case (4.2%). Two cases (8.3%) had persistent limitation of extension. But loss of extension was improved (6° and 7°). One case (4.2%) had persistent tenderness around the posterolateral aspect of radiocapitellar joint. This tenderness did not dissipate even at more than 90° of flexion of elbow (Table 2). However, symptom improved compared with preoperative findings. The patient did not need further treatment for the symptom.

#### 4. Discussion

Impingement of the posterolateral radiocapitellar plica is not a common finding as an intraarticular pathology in the elbow. There is still a lack of a physical examination maneuver to diagnose accurately, leading to inappropriate treatment. The present study focused on a reliable diagnostic test for the impingement of the pathologic posterolateral plicae of the radiocapitellar joint, and presented the outcomes of arthroscopic treatment in relatively larger number of cases compared with previous studies.<sup>[6,9,10]</sup>

In the present study, a new clinical test for the diagnosis of the impingement of the pathologic posterolateral radiocapitellar plica was proposed. The test was positive if the tenderness at the radiocapitellar joint which had occurred at low flexion angle was markedly diminished at more than 90° of flexion with maintaining manual compression force. The mediopatellar plica test of the knee joint performed in a similar way to the posterolateral radiocapitellar plica test proposed by the present study has been presented and conducted for diagnosis of pathologic mediopatellar plica in the knee joint.<sup>[3,20]</sup> According to the previous studies<sup>[21–23]</sup> consisting of a small number of patients, mechanical symptoms such as snapping and catching have been highlighted as a pathognomonic finding. Clarke<sup>[23]</sup> first described elbow plica of the radiohumeral joint in 1988. It caused painful snapping by posterolateral impingement and chondromalacia on the radial head in 3 patients. All patients showed improvement after arthroscopic debridement. Akagi et al<sup>[21]</sup> reported a case with a thickened synovial plica impinged between the radiocapitellar joint which developed pain and mechanical symptom after repetitive flexion and extension. Antuna et al<sup>[22]</sup> presented 14 cases with painful snapping caused by radiocapitellar plicae. All patients had painful snapping in the

posterolateral or anterolateral aspect of the elbow. The snapping occurred between 90° and 110° of flexion with the forearm in pronation. The snapping was reproducible in 7 patients (50%), and it was referred to as the flexion-pronation test. Twelve of 14 patients had successful arthroscopic treatments in this study. In the present study, simple mechanical symptoms such as snapping and catching in range of motion were observed in only 9 of 24 cases (37.5%). However, when the posterolateral radiocapitellar plica test was applied, 20 of 24 patients (83.3%) tested positive.

In addition to mechanical symptoms, tenderness to palpation in the anconeus soft spot was reported as another reproducible finding on physical examination.<sup>[9]</sup> In the present study, maximal tender point was on the posterolateral aspect of elbow overlying the radiocapitellar joint line in 20 of 24 cases (83.3%). The tenderness to direct palpation on the radiocapitellar joint line was shown to be a more sensitive test for diagnosis of posterolateral plica in elbow than simple mechanical symptoms (37.5%), and the sensitivity of radiocapitellar joint line tenderness was similar to that of the posterolateral radiocapitellar plica test. Accordingly, radiocapitellar joint line tenderness and the posterolateral radiocapitellar plica test can be considered to play key role in differential diagnosis between impingement of radiocapitellar plicae and other prevalent diseases of the elbow.

No patients were diagnosed with radiocapitellar plicae initially before referral to our clinic. Previous diagnosis was lateral epicondylitis in most patients (83.3%). Ruch et al<sup>[6]</sup> reported on ten patients with radiocapitellar plicae who were misdiagnosed as having lateral epicondylitis. Patients with lateral epicondylitis tend to present with lateral elbow pain radiating down the proximal forearm, weakened grip strength and pain aggravated with passive wrist flexion and resistive wrist extension. The tender point of lateral epicondylitis is typically medial and distal to the lateral epicondyle.<sup>[24,25]</sup> On the other hand, pain and tender point of impingement by radiocapitellar plicae are located at the posterolateral aspect of elbow over the radiocapitellar joint. When patients present with posterolateral elbow pain over the radiocapitellar joint, the impingement by radiocapitellar plicae should not be overlooked, even in the absence of mechanical symptoms. Additionally, if patients test positive for the posterolateral radiocapitellar plica test, the impingement by radiocapitellar plicae has to be considered as a cause of pain.

Previous radiologic studies suggested that synovial fold more than 3 mm in thickness was considered to be a pathologic plica as an abnormal finding.<sup>[11–13]</sup> In the present study, thickened radiocapitellar plica was detected by MRI in 17 cases (70.8%). MRI examination is a very useful radiologic tool in diagnosing plica of the elbow joint. However, Husarik et al<sup>[11]</sup> noted that high prevalence of a posterolateral plica in asymptomatic subjects (98%) suggested that mere presence of plica might not indicate clinical symptoms. Physical examination can complement weakness of diagnosis based solely on radiologic evaluation. When thickened radiocapitellar plica on MRI is accompanied with positive findings on physical examination, the impingement by the pathologic hypertrophic radiocapitellar plica can be diagnosed more accurately.

In present study, all patients who were treated with arthroscopic surgery for the pathologic posterolateral radiocapitellar plica had significant improvement compared to preoperative symptoms. The functional outcomes at 3 months postoperatively were significantly improved, and the improved functional outcomes tended to be maintained until the 2-year follow-up period. In this respect, critical point in treating

posterolateral radiocapitellar plica is that appropriate diagnosis should be made preoperatively. In arthroscopic finding, some patients had chondromalacia in addition to pathologic plicae. Thickened plicae can cause erosive lesion on radial head and capitellum by abrasion.<sup>[10,26]</sup> However, the mean of the postoperative functional scores of the patients with chondromalacia did not show significantly worse result than mean scores of those without chondromalacia. To draw a more reliable result, the long-term prospective study is needed, but after proper resection of plica, chondromalacia caused by radiocapitellar plica is considered to have no severe adverse effect on clinical outcome in the present study.

There were several inherent limitations that warrant review before definitive conclusions can be made. First, this study was retrospective in nature. To draw a solid conclusion, a prospective study is needed. Second, the MR images were reviewed and interpreted by an experienced musculoskeletal radiologist. However, radiologic evaluation unavoidably tends to be subjective. Experience is even more important because impingement by the posterolateral radiocapitellar plica is not a common lesion. Therefore, inevitable subjectivity in radiologic evaluation could pose a limitation and affect the results. Third, although our study was the largest case series in comparison to previous studies,<sup>[6,9,10]</sup> this study also consisted of a small number of patients. Only 24 cases during a period of 10 years were included in this study. This study had a relatively low power for statistical analysis due to a small number of patients. It does; however, show the rare prevalence of impingement by posterolateral plica in the radiocapitellar joint, and clinical importance of the present study.

## 5. Conclusions

Symptomatic impingement by a pathologic posterolateral plica of the radiocapitellar joint should be considered when posterolateral elbow pain which is refractory to conservative treatment, and other prevalent diseases are excluded. The posterolateral radiocapitellar plica test and radiocapitellar joint line tenderness could be recommended as reliable examination maneuvers to obtain accurate diagnosis. Arthroscopic debridement was an effective method for treating symptomatic plicae.

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