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# Intra-articular lesions and their relation to arthroscopic stabilization failure in young patients with first-time and recurrent shoulder dislocations

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**Background:** This study aimed to compare the frequency of intra-articular lesions between young patients with first-time shoulder dislocations and those with recurrent shoulder dislocations and to assess the correlation between intra-articular lesions and failure of arthroscopic stabilization.

**Methods:** The study enrolled 33 patients who underwent arthroscopic Bankart repair after first-time shoulder dislocation before the age of 30 years. There were 89 age-matched patients who were treated arthroscopically for recurrent dislocation included as a control group.

**Results:** Among intra-articular pathologic findings, anterior glenoid erosion ( $P = .043$ ) and anterior labral periosteal sleeve avulsion lesions ( $P = .048$ ) were found more frequently in the recurrent dislocation group. There was no statistically significant difference between the 2 groups in American Shoulder and Elbow Surgeons ( $P = .675$ ) and Rowe ( $P = .132$ ) scores at the last follow-up. However, there was a significant difference in the failure rate after operation between the 2 groups ( $P = .039$ ). In the first-time dislocation group, 1 patient had redislocation and none showed positive apprehension. In the recurrent dislocation group, 6 patients had redislocation and 10 patients had positive apprehension. Eight of 10 patients who showed positive apprehension had either anterior labral periosteal sleeve avulsion lesions or anterior glenoid erosion. The patients' satisfaction with daily activities was significantly better in the first-time dislocation group ( $93.0 \pm 5.2$ ) than in the recurrent dislocation group ( $82.7 \pm 7.2$ ;  $P < .001$ ).

**Conclusions:** Primary surgical treatment for first-time traumatic anterior shoulder dislocation provided satisfactory functional outcomes and improved quality of life. Primary arthroscopic stabilization can be considered one of the treatment options in patients younger than 30 years with first-time shoulder dislocation to prevent further intra-articular injuries that may contribute to recurrence.

**Level of evidence:** Level III; Retrospective Cohort Design; Treatment Study

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**Keywords:** Anterior shoulder dislocation; first-time shoulder dislocation; recurrent shoulder dislocation; arthroscopic stabilization procedure; ALPSA lesion; glenoid erosion

The Institutional Review Board of Ewha Womans University approved this study: No. ECT 14-06-01. Informed consent was obtained from all patients.

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The first episode of anterior shoulder dislocation usually occurs in a young population with high functional demands and overhead sports activity. Failure to intervene early in young patients with first-time traumatic anterior shoulder dislocation results in impaired shoulder function, apprehension in

sports activities, and recurrent dislocation.<sup>10</sup> The recurrence rate of acute traumatic anterior shoulder dislocation in young patients after conservative treatment is in the range of 50% to 82%.<sup>11,16,23</sup> Meanwhile, surgical treatment of first-time shoulder dislocation in young patients is associated with a lower recurrence rate of 3% to 15%.<sup>2,9,21</sup> Despite the high recurrence rate with conservative treatment, the necessity for early surgical stabilization to prevent further recurrence and morbidity for first-time traumatic shoulder dislocation in young patients is controversial. Several studies regarding the natural course of first-time shoulder dislocation supported conservative treatment as only half of high-risk patients with first-time shoulder dislocation require surgery after conservative treatment.<sup>12,22</sup>

Studies have demonstrated that intra-articular pathologic processes, such as anterior glenoid bone loss and engaging Hill-Sachs lesion, are more frequently found in patients with recurrent shoulder dislocations than in those with first-time dislocations.<sup>13,17,27</sup> Although some intra-articular findings are known to be contributing factors for recurrent dislocation, no study has correlated the presence of articular pathologic lesions with clinical outcomes. If specific pathologic lesions are found in shoulders with recurrent dislocation that contribute to poor outcomes and recurrences, it would be helpful to recommend early surgical intervention for first-time shoulder dislocations and to predict the prognosis of arthroscopic stabilization surgery in recurrent dislocation of the shoulder.

The purpose of this study was to compare the frequency of intra-articular pathologic lesions between patients younger than 30 years with first-time traumatic anterior shoulder dislocation and those with recurrent shoulder dislocation and to correlate their clinical outcomes after an arthroscopic stabilization procedure with arthroscopic findings. Our hypotheses were that patients treated with early surgical stabilization demonstrate a lower recurrence rate and that patients with chronic instability have more intra-articular pathologic changes, which may increase the recurrence rate.

## Methods

A total of 213 consecutive patients underwent primary arthroscopic stabilization procedures for anterior shoulder instability from January 2006 to May 2010.

Data from patients with first-time anterior shoulder dislocation who underwent arthroscopic Bankart repair were collected prospectively during the study period. Patients who experienced acute traumatic anterior shoulder dislocation for the first time, who were younger than 30 years when the first dislocation occurred, who had a radiograph of the dislocated shoulder or a medical record of closed reduction at the hospital, who had undergone preoperative magnetic resonance (MR) arthrography and three-dimensionally reconstructed computed tomography (3D CT) at 1 institute, who had anterior labral diseases such as Bankart or anterior labral periosteal sleeve avulsion (ALPSA) lesions demon-

strated on MR arthrography and confirmed by both a senior orthopedic surgeon and a radiologist, and who were followed up for at least 2 years were included in the first-time dislocation group. Patients were excluded from the study if their age at primary dislocation was older than 30 years; if they had a history of shoulder subluxation or no objective shoulder dislocation radiographs were available; if they had combined lesions that needed additional procedures, such as greater tuberosity fractures, anterior glenoid bone deficiency >25%, or an engaging Hill-Sachs lesion; if they had general ligamentous laxity; or if they had a history of previous shoulder surgery. The surgical indications for arthroscopic stabilization for first-time anterior shoulder dislocation included positive clinical test results for anterior shoulder instability, definitive radiologic anterior labral diseases without significant anterior glenoid bone loss, and the patient's demand for the surgery. All patients were informed that conservative treatment was also possible and gave consent for the surgery.

The control group was composed of age-matched patients with recurrent shoulder dislocation who underwent arthroscopic stabilization during the same period. Their postoperative clinical outcomes were not considered to minimize selection bias. The inclusion criteria for patients with recurrent shoulder dislocation were more than one traumatic anterior shoulder dislocation and anterior instability with subjective symptoms on clinical examination. The other inclusion criteria and the exclusion criteria for the recurrent dislocation patients were identical to those for the first-time dislocation patients.

The sample size was calculated on the basis of the interim results of this study. A power analysis was performed using the postoperative Rowe score as the primary outcome. The allocation ratio between patients with first-time dislocation and those with recurrent dislocation was set as 3 because of the difference in incidence observed in a pilot study. The Rowe score was compared between patients with first-time dislocation and selected age-matched patients with recurrent dislocation at the time when data were obtained from the first 15 patients with first-time dislocation. An effect size of 0.6 was calculated on the basis of a mean difference of 7 and a standard deviation of 6 observed in the interim results from 15 patients with first-time dislocation and 45 patients with recurrent dislocation. The pilot study indicated that a total sample size of 30 patients in the first-time dislocation group would provide a statistical power of 80% with type I error set at .05 to detect significant differences in the Rowe score.

Fifty-five patients with first-time anterior shoulder dislocation were enrolled in the study. Of them, 22 patients were excluded for failure to follow up, being older than 30 years at first-time dislocation episode, having been given preoperative radiography at a different institute, or disagreement between examiners regarding preoperative pathologic findings. Finally, a total of 33 patients were included in the first-time dislocation group. Of the remaining 158 patients who received arthroscopic Bankart repair, 89 age-matched pa-

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