



SHOULDER

Incidence of and risk factors for traumatic anterior shoulder dislocation: an epidemiologic study in high-school rugby players



Takayuki Kawasaki, MD, PhD^{a,*}, Chihiro Ota, AT^b, Shingo Urayama, AT^c,
Nobukazu Maki, PT^d, Masataka Nagayama, MD^a, Takefumi Kaketa, MD^a,
Yuji Takazawa, MD^a, Kazuo Kaneko, MD^a

^aDepartment of Orthopaedic Surgery, Juntendo University Faculty of Medicine, Bunkyo, Tokyo, Japan

^bKeio University Rugby Football Club, Yokohama, Kanagawa, Japan

^cDepartment of Sports Medicine, International Budo University, Katsuura, Chiba, Japan

^dMejiro Orthopaedic and Internal Medicine Clinic, Toshima, Tokyo, Japan

Background: The incidence of reinjuries due to glenohumeral instability and the major risk factors for primary anterior shoulder dislocation in youth rugby players have been unclear.

Purpose: The purpose of this study was to investigate the incidence, mechanisms, and intrinsic risk factors of shoulder dislocation in elite high-school rugby union teams during the 2012 season.

Methods: A total of 378 male rugby players from 7 high-school teams were investigated by use of self-administered preseason and postseason questionnaires.

Results: The prevalence of a history of shoulder dislocation was 14.8%, and there were 21 events of primary shoulder dislocation of the 74 overall shoulder injuries that were sustained during the season (3.2 events per 1000 player-hours of match exposure). During the season, 54.3% of the shoulders with at least one episode of shoulder dislocation had reinjury. This study also indicated that the persistence of glenohumeral instability might affect the player's self-assessed condition, regardless of the incidence during the current season. By a multivariate logistic regression method, a history of shoulder dislocation on the opposite side before the season was found to be a risk factor for contralateral primary shoulder dislocation (odds ratio, 3.56; 95% confidence interval, 1.27-9.97; $P = .02$).

Conclusions: High-school rugby players with a history of shoulder dislocation are not playing at full capacity and also have a significant rate of reinjury as well as a high risk of dislocating the other shoulder. These findings may be helpful in deciding on the proper treatment of primary anterior shoulder dislocation in young rugby players.

Level of evidence: Retrospective Survey Design, Epidemiologic Study.

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Keywords: Rugby; shoulder injury; glenohumeral instability; dislocation; epidemiology; high school

Ethics approval: Ethics approval for the study was received from the Juntendo University School of Medicine Research Ethics Committee (No. 2013093).

*Reprint requests: Takayuki Kawasaki, MD, PhD, Department of Orthopaedic Surgery, Juntendo University Faculty of Medicine, 2-1-1 Hongo, Bunkyo, Tokyo 113-8421, Japan.

E-mail address: k-saki@luck.ocn.ne.jp (T. Kawasaki).

Rugby is a popular collision sport, and the incidence of shoulder injury is much higher than that of other sports.^{9,20} According to several injury reports, acromioclavicular joint injury is the most common injury, whereas traumatic anterior shoulder dislocation (and subluxation) is the most severe shoulder injury in rugby.⁴⁻⁶ In addition, the incidence of rugby injuries increases in players in their late teens.^{2,21} Although there is controversy about whether primary anterior shoulder dislocation should be treated by surgery,^{1,16,19} the incidence of reinjury (recurrence) in rugby players remains unclear. Moreover, even a single shoulder dislocation and the persistence of glenohumeral instability may affect the subsequent performance of a player who has not received surgical treatment, regardless of whether there is a recurrent injury. Better understanding of the incidence and the impact of such injuries allows us to decide on the best treatment option and its timing for these players. In addition, investigation of the intrinsic risk factors for shoulder dislocation may contribute to the development of preventive strategies.

The purpose of this epidemiologic study was to describe the incidence of and risk factors for primary anterior shoulder dislocation in male high-school rugby players and its influence on the shoulder condition. We hypothesized that some tendencies and intrinsic factors for shoulder dislocation exist in this cohort.

Materials and methods

Subjects

This study was a prospective cohort study to elucidate the incidence and characteristics of injuries among rugby players in a sample of high schools. Seven teams, 4 prefecture-representative teams and their following 3, were approached to take part in the study. A total of 413 male rugby players aged 15 to 18 years (mean, 16.2 years) were enrolled. Thirteen of the subjects had participated in international youth games. The subjects and their team staff members received a thorough explanation of the study and provided their informed consent to participate. The study was approved by the ethics committee of the university to which the authors belong.

Demographics of the subjects

At the beginning of the 2012 season, demographic data were collected on all subjects by a self-administered questionnaire form. The data included anthropometric data, years of experience playing rugby, position (such as forward or back), side of dominance and the shoulder frequently used for collisions, and past history of shoulder injury and dislocation.

Postseason questionnaire

Just after the season, the incidence reports during the 2012 season were collected for all subjects by a self-administered

questionnaire form. The injury data were collected after the attending authors' explained the questions and were referred to the team records. In addition, the players were asked to rate the overall self-assessed condition of each shoulder throughout the season by a visual analog scale (VAS). The VAS was a 10-cm horizontal line with "0 = extreme worse" labeled on the far left and "10 = normal" labeled on the far right. The scales were measured to the nearest millimeter. The players were classified according to their status on their respective teams: grade A indicated a player who was a member of the first-team squad during the season; grade B indicated a player who was not. Information about the total number of matches and practice hours, excluding strength training sessions during the season, was also obtained from the team records. The players who had no chance to compete for more than 3 months or who retired from their athletic career during the season were excluded from the subsequent analysis.

Definition of injury

Injury

The definition of injury and the data collection procedures for studies of injuries were taken from the International Rugby Board consensus guidelines.¹² An injury was defined as an injury occurring during rugby training or playing that resulted in a player's being unable to take full part in future rugby training or match play for more than 24 hours.

Shoulder injury

Shoulder injuries included acromioclavicular joint injuries, shoulder contusions, clavicle fractures, and shoulder dislocation.

Shoulder dislocation

Because our study employed two questionnaires, it was difficult to determine whether shoulder dislocation was complete or partial dislocation (subluxation). Therefore, we defined an injury of shoulder dislocation in this study as a player's subjective feeling of the humerus separating from the glenoid at the glenohumeral joint, regardless of the presence of complete dislocation or subluxation. In addition, instability was defined as a state of instability in the glenohumeral joint due to previous shoulder dislocation.

Statistical analysis

The primary analysis was performed to demonstrate the importance of epidemiologic data. The incidence rates (IR) of these injuries were calculated to represent the injury per 1000 player-hours (PH) by match or practice. To understand the aspects of shoulder dislocation in the population, the odds ratio (OR) was also calculated. The rate of reinjury (recurrence) of shoulder dislocation per season was calculated according to the following formula: the number of shoulders with recurrent dislocation in the examined season is divided by the number of the shoulders with a history of shoulder dislocation among all examined players, except for those who had received surgical treatment for glenohumeral instability. For evaluation of whether a history of shoulder dislocation negatively affected the player's performance, the self-assessed condition of VAS score was compared between the players who had previously sustained a shoulder dislocation (group SD) and those with no such history (control group) by the

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