Journal of Orthopaedics 14 (2017) 166–170

Contents lists available at ScienceDirect

Journal of Orthopaedics

journal homepage: www.elsevier.com/locate/jor

Original article

Comparison of the epidemiology and outcomes of traumatic and nontraumatic rotator cuff tears

Takeshi Teratani

From Ouryouji Orthopaedic Hospital, 162 Hosono,Kobayashi, Miyazaki 886-0004, Japan

ARTICLE INFO

Article history:
Received 4 November 2016
Accepted 25 December 2016
Available online xxx

Keywords:
Traumatic rotator cuff tear
Non-traumatic rotator cuff tear
Epidemiology
Range of motion
Long head of biceps

ABSTRACT

Objective: The purpose of this study was to investigate the differences in the epidemiology and outcomes of traumatic and nontraumatic rotator cuff tears.
Methods: Thirty-three patients with traumatic and 46 with nontraumatic rotator cuff tears were included.
Results: The rate of injury to the long head of the biceps was significantly higher in the traumatic group. Preoperative active forward elevation was significantly lower in the traumatic group.
Conclusion: The outcomes of both groups were good. This may have been because milder preoperative muscle atrophy and a shorter duration of symptoms were observed in the traumatic group.

1. Introduction

Rotator cuff tears are main causes of shoulder pain and dysfunction. Several causes of rotator cuff tears have been reported, including both intrinsic and extrinsic factors. One intrinsic factor is age-related tendon degeneration.[1,2,3] Conversely, according to Neer,[4] an extrinsic factor is impingement of the supraspinatus tendon on the acromion. However, traumatic events are another cause of rotator cuff tears. When rotator cuff tears occur for other reasons, they may exhibit different characteristics, including various epidemiological factors, clinical outcomes, status of the rotator cuff, and pathology of the long head of the biceps (LHB). However, little is known about the differences between traumatic and nontraumatic rotator cuff tears.

Braune et al.[5] reported that patients with traumatic rotator cuff ruptures are younger than those with nontraumatic ruptures. Kukkoken et al.[6] reported that the size of rotator cuff tears in the traumatic group was significantly larger than that in the non-traumatic group, although the average age in both groups was similar.

The purpose of this study was to investigate the differences, including epidemiology, comorbidities, clinical outcomes, range of motion (ROM), muscle atrophy, size of rotator cuff tears, retear rate, and pathological features of the LHB between traumatic and nontraumatic rotator cuff tears. The hypothesis was that traumatic rotator cuff tears were likely to occur in male and younger patients than in the nontraumatic rotator cuff tears. Also arthroscopic rotator cuff repair for traumatic rotator cuff tears would have better results than in the nontraumatic rotator cuff tears.

2. Materials and methods

This retrospective study was approved by our Institutional Review Board. The inclusion criteria were patients who (1) had undergone preoperative magnetic resonance imaging (MRI) documenting a rotator cuff tear, (2) had undergone arthroscopic repair of the rotator cuff tear, and (3) had a minimum 1-year clinical follow-up. Exclusion criteria included (1) cuff tear arthropathy, and (2) previous surgery on the affected shoulder. In total, 82 shoulders (78 patients) underwent arthroscopic rotator cuff repair from 2012 to 2013. The indications for operative treatment of rotator cuff tears at our institute were typical symptoms of shoulder pain and detected dysfunction of the shoulder joint. All patients underwent nonoperative treatment that included a corticosteroid injection to the subacromial space and physical therapy before surgery. One patient was excluded after the record review because of a history of shoulder surgery on the affected side. Among the remaining 81 patients, two were lost during follow-up before 1 year postoperatively, resulting in 79 patients. The overall follow-up rate was 97.5%. The patients were divided into two groups: the traumatic group and nontraumatic group. In cases involving trauma at the onset of symptoms, the rotator cuff tear was determined to be traumatic and the mechanism of injury was recorded.

E-mail address: jordan200618@yahoo.co.jp (T. Teratani).

http://dx.doi.org/10.1016/j.jor.2016.12.007
0972-978X/

2.1. Study variables

2.1.1. Outcomes instruments

Preoperative and postoperative instruments for shoulder function included the Japan Orthopaedic Association (JOA) score, University of California Los Angeles (UCLA) score, American Shoulder and Elbow Surgery (ASES) score, and Constant score. All patients underwent a standardized physical examination performed by the first author (T.T.) both preoperatively and postoperatively. Active ROM was measured with a goniometer and included evaluation of the scapular plane elevation of the shoulder and external rotation with the arm at the side.

2.1.2. Demographics

Demographic variables evaluated in both groups were sex, age, dominant side, symptom duration, comorbidities (heart and vascular disease and diabetes mellitus), smoking status, body mass index, occupation (deskwork, light work including housework, or heavy work), and mechanism of injury.

2.1.3. Radiographic and operative variables

The presence of retears was determined from the baseline MRI report. The size of the rotator cuff tears and pathology of the LHB were evaluated intraoperatively.

2.1.4. Surgical procedure

All operations were performed by the first author (T.T.) with the patient under general anesthesia and in the beach chair position. Depending on the size of the rotator cuff tear, single-row repair for partial tears and small tears was performed; otherwise, conventional suture bridge repair for larger than small tears was performed. Subacromial decompression and anterior acromioplasty were performed in all patients. LHB tendon tenotomy or tenodesis was performed in patients with a positive hourglass test result and in patients with dislocation or subluxation of the LHB as detected from the bicipital groove. Pathological conditions of the LHB were divided into four groups according to the condition of the LHB: absent group (absence of the LHB within the joint), hourglass group (positive hourglass test result), dislocation group (dislocation or subluxation from the bicipital groove), and fraying group (fraying of the LHB).

A sling was used for 5 weeks postoperatively. At 2 weeks postoperatively in all patients, passive ROM exercise with physical therapy was permitted. At 6 weeks, active ROM exercise was permitted.

2.1.5. Statistical analysis

Mann-Whitney test was used to compare the differences in the outcomes between the two groups. A paired *t*-test was used to compare the differences in the preoperative and postoperative outcomes for each group. Multivariate analysis was done with the chi-square test. SPSS Statistics for Windows, version 20.0 (IBM Corp., Armonk, NY) was used for the statistical analyses. The level of statistical significance was set at $P < 0.05$. Results are given as the mean value.

3. Results

3.1. Patient demographics

All patient demographics are listed in Table 1. There were no statistically significant differences in sex or average age between the two groups ($P = 0.14$ and 0.91, respectively), although the proportion of men was higher in the traumatic group (60.6%) than in the nontraumatic group (43.5%). There were no significant differences in the proportions of the dominant shoulder affected, number of smokers, or body mass index between the two groups ($P = 0.23$, 0.63, and 0.55, respectively). The proportion of patients with heart and vascular disease was significantly higher in the nontraumatic group than in the traumatic group ($P = 0.008$). Conversely, the proportion of patients with diabetes mellitus was significantly higher in the traumatic group than in the nontraumatic group ($P = 0.01$). The proportion of patients engaged in light work such as housework was significantly higher in the nontraumatic group than in the traumatic group ($P = 0.03$).

Table 1
Patient Demographics.

	Traumatic group (n = 33)	Nontraumatic group (n = 46)	P value
Males: females, number (%)	20 (60.6): 13 (39.4)	20 (43.5): 26 (56.5)	0.14
Age at surgery ±SD, year (range)	66.8 ± 7.1 (49–85)	67.0 ± 7.7 (48–81)	0.91
Dominant shoulder affected, number (%)	28 (84.8)	34 (73.9)	0.23
Symptom duration ± SD, month (range)	7.1 ± 12.9 (1–72)	16.9 ± 23.2 (1–120)	0.02*
Co-morbidities, number (%)			
Heart and vascular disease	6 (18.2)	21 (45.7)	0.008*
Diabetes millitus	9 (27.3)	2 (4.3)	0.01*
Smoker, number (%)	4 (12.1)	4 (8.7)	0.63
Mean body mass index in kg/m2 ± SD, (range)	24.9 ± 3.9 (18.6–37.7)	24.4 ± 3.4 (16.6–34.2)	0.55
Occupation, number (%)			
Deskwork	2 (6.1)	1 (2.2)	0.42
Light work (included housework)	10 (30.3)	25 (54.3)	0.03*
Heavy work	10 (30.3)	15 (32.6)	0.83
None	11 (33.3)	5 (10.9)	0.02*
Mechanism of injury, number (%)			
Fall	17 (51.5)	0	
Bring something heavily	8 (24.2)	0	
Sport	3 (9.1)	0	
Others	5 (15.2)	0	
Unclear	0	46	

* Significant P value ($P < 0.05$).