## MINIREVIEWS

**6031** Diabetes among Muslims during Ramadan: A narrative review

*Ochani RK, Shaikh A, Batra S, Pikale G, Surani S*

## ORIGINAL ARTICLE

### Retrospective Cohort Study

**6040** Clinical evaluation of ventilation mode on acute exacerbation of chronic obstructive pulmonary disease with respiratory failure

*Wang JJ, Zhou Z, Zhang LY*

### Retrospective Study

**6051** Predictive value of preoperative albumin-bilirubin score and other risk factors for short-term outcomes after open pancreatoduodenectomy


**6066** Lyophilized recombinant human brain natriuretic peptide for chronic heart failure: Effects on cardiac function and inflammation

*Li F, Li H, Luo R, Pei JB, Yu XY*

**6073** Continuous renal replacement therapy with oXiris® in patients with hematologically malignant septic shock: A retrospective study


**6083** Serum basic fibroblast growth factor and interleukin-1β predict the effect of first-line chemotherapy in patients with advanced gastric cancer

*Zheng L, Gan LH, Yao L, Li B, Huang YQ, Zhang FB, Kuang MQ, Fang N*

**6091** Multinucleated giant cells of bladder mucosa are modified telocytes: Diagnostic and immunohistochemistry algorithm and relation to PD-L1 expression score

*Gulinac M, Velikova T, Dikov D*

### Clinical Trials Study

**6105** Comparing the efficacy of regen-cov, remdesivir, and favipiravir in reducing invasive mechanical ventilation need in hospitalized COVID-19 patients

*Hegazy SK, Tharwat S, Hassan AH*

## META-ANALYSIS

**6122** Risk factors for stroke recurrence in young patients with first-ever ischemic stroke: A meta-analysis

*Xia Y, Liu H, Zhu R*
SCIENTOMETRICS

6132 Unveiling the hidden world of gut health: Exploring cutting-edge research through visualizing randomized controlled trials on the gut microbiota

CASE REPORT

6147 Rivaroxaban for the treatment of heparin-induced thrombocytopenia with thrombosis in a patient undergoing artificial hip arthroplasty: A case report
Lv FF, Li MY, Qu W, Jiang ZS

6154 Mepolizumab induced palmoplantar psoriasis: A case report
Artosi F, Dilevio L, Vultaggio M, Campione E, Bianchi L

6159 Early diagnosis of renal pelvis villous adenoma: A case report
Li LL, Song PX, Xing DF, Liu K

6165 Identification of the dominant loop of a dual-loop macro-reentry left atrial flutter without prior intervention using high-density mapping technology: A case report
Yu SD, Chu YP

6170 Surgery for fibrous dysplasia associated with aneurysmal-bone-cyst-like changes in right proximal femur: A case report
Xie LL, Yuan X, Zhu HX, Pu D

6176 Efficacy of abatacept treatment in a patient with enteropathy carrying a variant of unsignificance in CTLA4 gene: A case report
Musabak U, Erdoğan T, Ceylaner S, Özbek E, Suna N, Özdemir BH

6183 Postpartum hemophagocytic lymphohistiocytosis: A case report
An JH, Ahn JH

6189 Non-arteritic anterior ischemic optic neuropathy combined with branch retinal vein obstruction: A case report
Gong HX, Xie SY

6194 Large colonic lipoma with a laterally spreading tumor treated by endoscopic submucosal dissection: A case report
Bae JY, Kim HK, Kim YJ, Kim SW, Lee Y, Ryu CB, Lee MS

6200 T/myeloid mixed-phenotype acute leukemia treated with venetoclax and decitabine: A case report
Park S, Jeong EJ, Kang JH, Lee GW, Go SI, Lee DH, Koh EH

6206 Severe inflammatory disorder in trisomy 8 without myelodysplastic syndrome and response to methylprednisolone: A case report
Pan FY, Fan HZ, Zhuang SH, Pan LF, Ye XH, Tong HJ
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>6213</td>
<td>Aggressive variant prostate cancer: A case report and literature review</td>
<td>Weng XT, Lin WL, Pan QM, Chen TF, Li SY, Gu CM</td>
</tr>
<tr>
<td>6231</td>
<td>Left epigastric isolated tumor fed by the inferior phrenic artery diagnosed as ectopic hepatocellular carcinoma: A case report</td>
<td>Liu HB, Zhao LH, Zhang YJ, Li ZF, Li L, Huang QP</td>
</tr>
<tr>
<td>6240</td>
<td>Squamous cell carcinoma associated with endometriosis in the uterus and ovaries: A case report</td>
<td>Cai Z, Yang GL, Li Q, Zeng L, Li LX, Song YP, Liu FR</td>
</tr>
<tr>
<td>6246</td>
<td>Intestinal obstruction due to giant liver cyst: A case report</td>
<td>Kucuk A, Mohamed SS, Abdi AM, Ali AY</td>
</tr>
<tr>
<td>6274</td>
<td>Variant of Guillain-Barré syndrome with anti-sulfatide antibody positivity and spinal cord involvement: A case report</td>
<td>Liu H, Lv HG, Zhang R</td>
</tr>
<tr>
<td>6289</td>
<td>Collision tumor of primary malignant lymphoma and adenocarcinoma in the colon diagnosed by molecular pathology: A case report and literature review</td>
<td>Jiang M, Yuan XP</td>
</tr>
<tr>
<td>6298</td>
<td>Successful resolution of gastric perforation caused by a severe complication of pancreatic walled-off necrosis: A case report</td>
<td>Noh BG, Yoon M, Park YM, Seo HI, Kim S, Hong SB, Park JK, Lee MW</td>
</tr>
<tr>
<td>6304</td>
<td>Bilateral dislocation of the long head of biceps tendon with intact rotator cuff tendon: A case report</td>
<td>Sohn HJ, Cho CH, Kim DH</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------</td>
</tr>
</tbody>
</table>
## Contents

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<table>
<thead>
<tr>
<th>NAME OF JOURNAL</th>
<th>INSTRUCTIONS TO AUTHORS</th>
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<table>
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<tr>
<th>ISSN</th>
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<tbody>
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<th>LAUNCH DATE</th>
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<tbody>
<tr>
<td>April 16, 2013</td>
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<table>
<thead>
<tr>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrice Monthly</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EDITORS-IN-CHIEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bao-Gan Peng, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati, Ja Hyeon Ku</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EDITORIAL BOARD MEMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://www.wjgnet.com/2307-8960/editorialboard.htm">https://www.wjgnet.com/2307-8960/editorialboard.htm</a></td>
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<th>PUBLICATION DATE</th>
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<tbody>
<tr>
<td>September 16, 2023</td>
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Bilateral dislocation of the long head of biceps tendon with intact rotator cuff tendon: A case report

Hyuk-Joon Sohn, Chul-Hyun Cho, Du-Han Kim

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Abstract

BACKGROUND
Dislocation of the long head of biceps tendon (LHBT) usually involves rotator cuff injury, and isolated dislocation with an intact rotator cuff is rare. Some cases of isolated dislocation have been reported. However, to the best of our knowledge, there has been no report of bilateral dislocation of the LHBT without rotator cuff pathology.

CASE SUMMARY
A 23-year-old male presented to our outpatient clinic with left side dominant pain in both shoulders. The patient had no history of trauma or overuse. The patient underwent intra-articular injection and physical therapy, but his symptoms aggravated. Based on preoperative imaging, the diagnosis was bilateral dislocation of the LHBT. Dysplasia of the bicipital groove was detected in both shoulders. Active dislocation of the biceps tendon over an intact subscapularis tendon was identified by diagnostic arthroscopy. Staged biceps tenodesis was performed and continuous passive motion therapy was administered immediately after surgery. The patient’s pain was resolved, and full functional recovery was achieved, and he was satisfied with the condition of his shoulders.

CONCLUSION
This study describes a rare case of bilateral dislocations of the LHBT without rotator cuff injury due to dysplasia of the bicipital groove.

Key Words: Shoulder; Biceps; Dislocation; Rotator cuff; Tenodesis; Case report

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Core Tip: The long head of biceps tendon (LHBT), which has been regarded as a significant cause of anterior shoulder pain, often occurs with other shoulder pathologies. Trauma and repetitive mechanical wear can lead to development of biceps subluxation and dislocations. Association of sports activity and injury with LHBT pathology has also been reported. The subscapularis fiber function as the medial and proximal portion of the soft tissue sling and subscapularis lesions are almost always accompanied by dislocation. This report describes a rare case of bilateral dislocation of the LHBT without rotator cuff pathology.

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INTRODUCTION

The long head of biceps tendon (LHBT), which has been regarded as a significant cause of anterior shoulder pain, often occurs with other shoulder pathologies[1,2]. LHBT, which originates from the supraglenoid tubercle, runs within the intracapsular space, making a 30-degree turn into the bicipital groove. The bicipital groove is located between the greater and lesser tuberosities; this osseous component of the bicipital groove provides stability to the LHBT. The soft tissue system, including the coracohumeral ligament (CHL), superior glenohumeral ligament (SGHL), and interwoven fibers of the subscapularis and supraspinatus tendon, are the most important stabilizers[3-5]. Trauma and repetitive mechanical wear can lead to development of biceps subluxation and dislocations. Association of sports activity and injury with LHBT pathology has also been reported[6]. These cases usually involve pulley lesions. The SGHL/CHL complex and subscapularis fiber function as the medial and proximal portion of the soft tissue sling and subscapularis lesions are almost always accompanied by dislocation[7-11].

This report describes a rare case of bilateral dislocation of the LHBT without rotator cuff pathology. Some authors have reported on cases of isolated dislocation of the LHBT with an intact rotator cuff tendon[7,8,10,12,13]. However, to the best of our knowledge, there have been no reports of bilateral isolated dislocation of the LHBT without any event including trauma or overuse.

CASE PRESENTATION

Chief complaints
A 23-year-old male presented to our clinic with left side dominant pain in both shoulders.

History of present illness
Gradual aggravation of the patient’s symptoms occurred over the last year, even after physical therapy and intra-articular injection. The patient reported that raising his arm was difficult. The pain was more severe on the left side and became aggravated when lifting heavy objects.

History of past illness
The patient first visited our hospital four years ago, complaining of left side dominant pain in both shoulders. He was then diagnosed with impingement syndrome in both shoulders and visited another local hospital to undergo physical therapy and receive conservative management. After four years of conservative management, the patient returned to our clinic with aggravated pain in both shoulders.

Personal and family history
The patient was a college student with no history of heavy loading activity or overuse, and there was no history of trauma or sport injury as well. There was no other past illness or family history.

Physical examination
On physical examination, the patient’s pain was localized to the bicipital groove area and lesser tuberosity in both shoulders. O’Brien test, Speed’s test, and Yegarson test showed a positive result in both shoulders. The patient’s range of motion (ROM) was in nearly normal range in both shoulders. The results of manual muscle testing showed no muscle weakness.

Laboratory examinations
The results of preoperative laboratory tests were normal.
Imaging examinations
A simple radiograph showed no signs of bony anomaly. Shoulder ultrasonography showed a shallow bicipital groove with an intact subscapularis tendon in both shoulders (Figure 1). Computed tomography scan showed a dysplastic bicipital groove along with flattening of the medial wall of the groove (Figure 2). Preoperative magnetic resonance imaging (MRI) showed that the LHBT was medially dislocated in both shoulders. LHBT distance was 17.9 mm on left shoulder and 20.9 mm on right shoulder[14]. The subscapularis tendon and the supraspinatus tendon were intact on both sides (Figure 3). The morphology of the bicipital groove was examined using the technique introduced by Yoo et al.[15]. The opening angle of the bicipital groove was 124.6 degrees on the right side and 137.0 degrees on the left side. The medial wall angle was 25.7 degrees on the right side and 21.4 degrees on the left side. The depth of each bicipital groove was 2.41 mm in the right shoulder, and 1.34 mm in the left shoulder. The bicipital groove in both shoulders was considered shallow, as proposed in previous studies[15,16]. Considering the values measured in MRI, the groove was more shallow on the left side, where the pain was more severe.

FINAL DIAGNOSIS
The final diagnosis for the presented case was bilateral dislocations of the long head of bicep tendon (Walch classification type I, Bennett type 4) with dysplasia of both bicipital grooves.

TREATMENT
Diagnostic shoulder arthroscopy was first performed on the left shoulder because the patient had left side dominant pain. A partial tear and synovitis of the LHBT were observed on the initial inspection. When the LHBT was pulled medially, active dislocation of the LHBT over the intact subscapularis tendon was detected (Figure 4A, Video). An assessment of the intact rotator cuff on the bursa side was performed. Finally, subpectoral biceps tenodesis was performed using a suture anchor (Figure 5A).

Surgical treatment of the right shoulder was administered after functional recovery had been achieved, four months after treatment of the left shoulder. Fraying of the biceps tendon pulley was detected by diagnostic arthroscopy. The LHBT was actively dislocated to the anterior side of the subscapularis tendon with application of medial traction (Figure 4B). As with the left shoulder, pulley release and subpectoral tenodesis were performed using a suture anchor (Figure 5B). The supraspinatus and subscapularis tendons were also intact. The patient started immediate postoperative continuous passive motion therapy with restriction of active elbow flexion. There were no complications in either shoulder.

OUTCOME AND FOLLOW-UP
The patient’s symptoms showed significant improvement after subpectoral tenodesis. Before the surgery, the visual analogue scale (VAS) score was 5 and the score for subjective shoulder value (SSV) was 50%. The UCLA score was 21 for both shoulders and the American Shoulder and Elbow Surgeons (ASES) score was 58.33 prior to the surgery. Three months after left biceps tenodesis, the VAS score had improved to 2 with nearly full ROM, the UCLA score improved to 32, SSV improved to 60%, and the ASES score improved to 86.67. At the last follow-up, which was post-operative 22 mo on the left side and 18 mo on the right side, the VAS score was 1 with full ROM, and the UCLA score was 33 for both shoulders. The SSV score was 85%, and the ASES score had improved to 85. The patient returned to his ordinary life within three months after surgery, and he was satisfied with the functional improvement without pain at six months after surgery.

DISCUSSION
Many authors have reported that dislocation of the LHBT often involves rotator cuff pathology[7,9-11]. Desai and Mata[9], who reviewed 141 shoulders with full-thickness rotator cuff tear, asserted that the incidence of LHBT pathology was significantly greater for tears involving subscapularis. In addition, an increase in the size of the rotator cuff tear was statistically related to increased incidence of LHBT pathology. Walch et al.[10] also emphasized that subluxation of the LHBT is always associated with minor lesions of subscapularis, and dislocation over a completely intact subscapularis is rare.

However, other authors have maintained that isolated dislocation of the LHBT might occur without rotator cuff injury. Ayoubi et al.[17] reported on a case of bilateral dislocation without detection of any subscapularis tears. The patient’s symptoms were remarkably similar to those of our patient. However, our case did not involve the bifid subscapularis tendon, which is a rare congenital anomaly. The LHBT was located inside the substance of the subscapularis tendon. Instability of the biceps tendon with an intact rotator cuff due to injury in other stabilizing factors has also been noted. According to Gambill et al.[8] and Vopat et al.[12], isolated dislocation of the LHBT may occur as a result of injury in capsu-
The stability of the LHBT can also be attributed to the osseous dimensions of the bicipital groove[3]. Yoo et al[15], who measured the depth of the bicipital groove, medial angle, and opening angle on shoulder MRI in order to examine the influence of bony morphology of the bicipital groove on the stability of the LHBT, concluded that bony morphology characterized by a shallow groove was associated with increased prevalence of LHBT instability. Levinsohn and Santelli [18] reported comparable results; a dislocated biceps tendon was detected on bicipital groove view on plain radiography in 58% of patients with a flattened bicipital groove and dysplasia of the lesser tuberosity. Because the medial wall of the bicipital groove functions as a trochlea about which the biceps tendon glides, the dysplasia of the medial wall and flattening of the bicipital groove observed in our case could be a reason for bilateral dislocation of the LHBT without rotator cuff tear.

In this study, the patient experienced pain in both shoulders caused by bilateral dislocation of the LHBT. Unlike a typical case, the dislocation was not associated with rotator cuff pathology or a traumatic event. Isolated dislocation of the LHBT was triggered by dysplasia of the bicipital groove in each shoulder. The patient underwent biceps tenodesis on both sides and satisfactory clinical and functional outcomes were finally achieved.
CONCLUSION

We have described a rare case of bilateral dislocation of the LHBT without previous trauma and rotator cuff injury. To the best of our knowledge, this is the first reported case to demonstrate that bilateral dislocation of the biceps tendon may occur as a result of dysplasia of the bicipital groove without rotator cuff pathology. Physical examination and evaluation of the bicipital groove should be emphasized in patients with anterior shoulder pain of unknown cause even in cases where it occurs bilaterally and without trauma or repetitive overhead activity.
Figure 5 Postoperative radiographs after subpectoral tenodesis. A: Left shoulder; B: Right shoulder.

FOOTNOTES

Author contributions: Sohn HJ and Cho CH contributed equally to this article as first authors; Cho CH and Kim DH designed the research study; Sohn HJ and Kim DH performed the research; Cho CH contributed new reagents and analytic tools; Cho CH and Sohn HJ analyzed the data and wrote the manuscript; and all authors have read and approved the final manuscript.

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