



Treatment of reverse Hill-Sachs lesion by autograft reconstruction

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Reverse Hill-Sachs lesion is a defect caused by the anterior compression fracture of the humeral head in posterior shoulder dislocation. We present a 34-year-old male patient with pain and limited joint mobility in the right shoulder due to a fall following electric shock 2 days prior to admission. Radiography and CT of the shoulder revealed posterior dislocation of the shoulder with a reverse Hill-Sachs lesion. The patient underwent open reduction of the humeral head, elevation of the depressed osteochondral surface, reconstruction using autograft, and repair of the posterior surface of the glenohumeral joint capsule 5 days following trauma. At the 5th year follow-up, the patient had a perfect outcome when evaluated using the Constant score.

Key words: Autograft reconstruction; posterior shoulder dislocation; reverse Hill-Sachs lesion; surgical treatment.

Reverse Hills-Sachs lesion of the shoulder is a rare injury after posterior shoulder dislocation and occurs in less than 2% of shoulder dislocations.^[1,2] Posterior shoulder dislocation occurs due to high-energy axial loading during internal rotation, anterior elevation and adduction.^[3] Its most common accompanying lesions are proximal humerus fracture and impaction of the posterior glenoid labrum against the anterior osteochondral surface of the humeral head which may result in a depression fracture, termed as reverse Hill-Sachs lesion.^[1,2]

We present a case of reverse Hill-Sachs in which the osteochondral depression in the humeral head was repaired by autograft reconstruction without using an internal fixation material.

Case report

A 34-year-old male patient presented to our polyclinic with pain, deformity and limited joint mobility in the right shoulder due to a fall caused by an electric shock 2 days earlier. The patient first presented to another clinic immediately following trauma. No bone pathology was determined and the use of an arm sling was recommended. At our clinic, physical examination revealed diffuse edema and ecchymosis in the right shoulder. Palpation showed tenderness and pain over the shoulder region. Right shoulder joint mobility was markedly limited and painful. There was no vascular or neurological damage. Shoulder radiographs (Fig. 1) and CT images (Fig. 2) displayed reverse Hill-Sachs lesion in the right

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Fig. 1. Anteroposterior radiograph of the right shoulder.

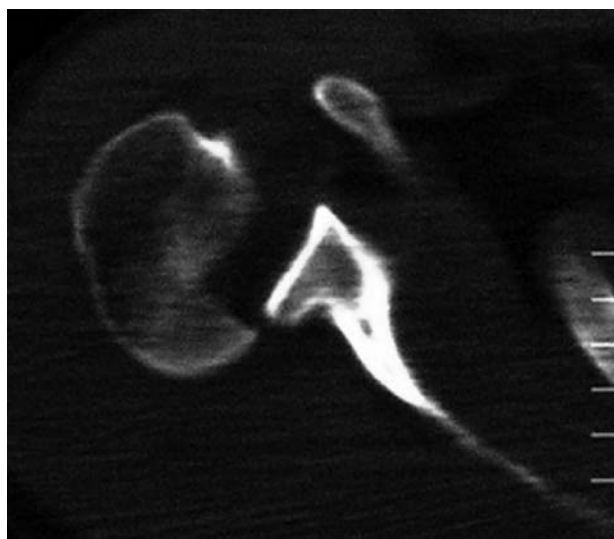


Fig. 2. Preoperative axial CT image of the right shoulder.

shoulder. Following application of a Velpau bandage, the case underwent open reduction and autograft reconstruction 5 days after the trauma.

Following anesthesia, surgery was begun on the right shoulder using a Cubbins incision. The anterior half of the deltoid muscle was elevated from the acromion and retracted inferolaterally. The joint was reached from the anterior aspect via capsular incision and the dislocation was reduced. The humeral head was positioned in external rotation and the posterior joint capsule detached from the glenoid was repaired. Then, a window was established by opening a flap from the lateral cortex of the humeral head, the anterior osteochondral depression was elevated and a tricortical autograft

harvested from the iliac wing of the patient was filled into the defective area (Figs. 3 and 4). Immobilization of the humeral head by internal fixation using a Herbert screw was planned. However, stability and spherical shape of the humeral head was evaluated to be in perfect condition requiring no internal fixation due to the careful elevation of the osteochondral depression with the autograft. The anterior capsule was repaired by restoring the flap elevated from the lateral cortex.

The patient's right joint was immobilized for 3 weeks. An exercise program to improve shoulder joint mobility and strength of the shoulder muscles was begun at the 3rd postoperative week. The patient was followed up for 5 years (Figs. 5 to 7), evaluated periodi-



Fig. 3. Postoperative anteroposterior radiograph of the patient at one day.

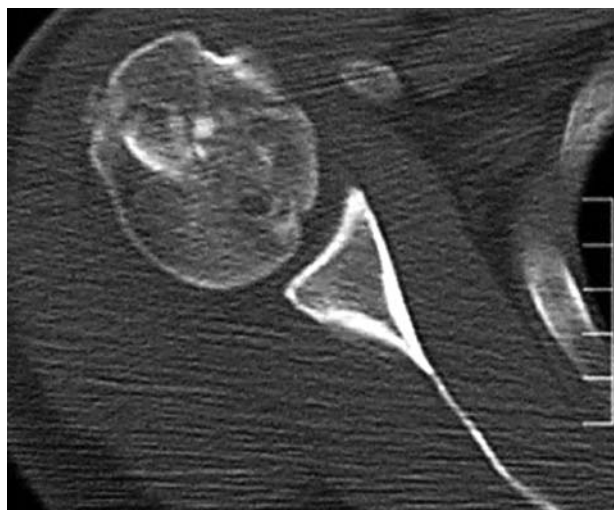


Fig. 4. Postoperative axial CT image of the shoulder at 2 weeks.



Fig. 5. Postoperative anteroposterior radiograph of the right shoulder at 2 years.

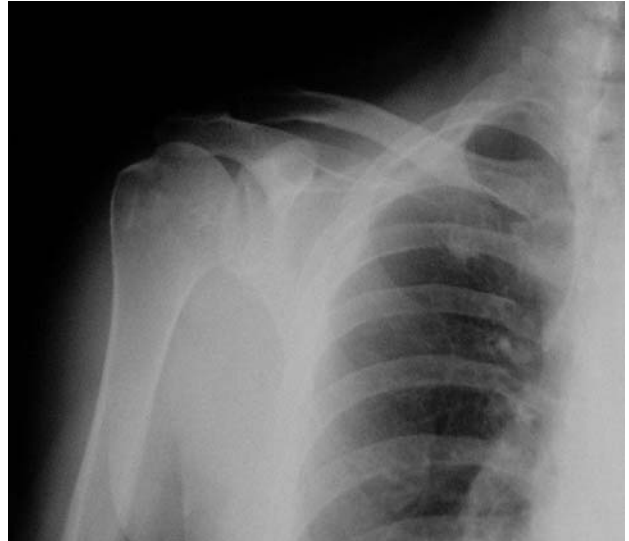


Fig. 6. Postoperative anteroposterior radiograph of the patient at 4 years.

cally using the Constant score,^[4] and had a perfect outcome (Fig. 8).

Discussion

Reverse Hill-Sachs lesions occur in less than 2% of shoulder dislocations and are most commonly seen in males between 35 and 55 years of age.^[1,2] Dislocation occurs due to internal rotation, anterior elevation, and high-energy axial loading during adduction.^[3] Generally, diagnosis is established in a delayed fashion in posterior dislocations; 50% of cases cannot be identified at initial examination.^[1,2,5] Typical physical symptoms are shoulders exhibiting adduction and internal rotation as well as markedly limited external rotation.^[1,2]

Radiographic diagnosis can be established through standard anteroposterior and apical oblique or modified axillary radiographs. CT is helpful in assessing the size of the humeral head defect and its relation with the glenoid.^[1,5,6]

Posterior dislocations often occur as a result of electric shock, epileptic seizure, high-energy trauma, and electroconvulsive therapy.^[1,2,7] Posterior dislocations may be accompanied by an anteromedial depression of the humerus and proximal humeral fractures, such as surgical humeral neck or tubercle fracture.^[1,2] Acute dislocation may damage the posterior stabilizers in the form of a capsulolabral tear, avulsion, glenoid labial fracture or rotator cuff fracture.^[1]



Fig. 7. (a-b) Postoperative anteroposterior radiographs of the patient at 5 years.



Fig. 8. Postoperative clinical views of the right shoulder at (a) external rotation, (b) anterior elevation, and (c) posterior internal rotation. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

Although many treatment methods have been identified, the approach for fracture dislocation vary depending on the lesion type, interval between the trauma and treatment and the patient’s age, expectation and activity level.^[3] The aim of the treatment is to achieve a functional and painless shoulder.^[1]

In the treatment of locked posterior shoulder fracture dislocation, McLaughlin recommended transfer of the subscapularis tendon to the humeral head defect in cases with a depression involving on 20 to 40% of the humeral head in order to increase the stability of the shoulder and prevent recurrence of dislocation.^[8] Hughes and Neer modified McLaughlin’s technique and suggested a transfer of the subscapularis tendon and osteotomized tuberculum minus humeri to the anteromedial aspect of the humeral head defect.^[2] Although not often applied, rotational osteotomy of the proximal humerus is an additional surgical treatment, although it’s difficulty and devascularization risk of the humeral head are reasons why this method is not commonly preferred.^[9] The suc-

cess rate of such non-anatomical methods aiming for stabilization is not high in cases with a large humeral defect. Moreover, these methods lead to dysfunction in the subscapularis tendon, weakness in internal rotation and contraction in the shoulder joint.^[10,11]

Reconstruction with bone graft is recommended in patients with a duration of dislocation not exceeding 2 weeks, a defective area not surpassing 25 to 50% of the humeral head, no osteoarthritic changes and healthy bone tissue in the humeral head.^[1,2,11]

Although there are many techniques used for the treatment of humeral head fracture dislocation injuries, humeral head arthroplasty is the most common.^[12] Arthroplasty may be the appropriate option in cases with failed open reduction, a defect affecting more than 50% of the humeral head and secondary osteoarthritic changes over the joint surface.^[1-3,13] Hemiarthroplasty is suggested for patients over 65 years of age with acute 3- or 4-piece humeral head fractures due to high devascularization risk.^[3,14] Hawkins et al. recommended shoulder

prosthesis in cases with a duration of dislocation longer than 6 months and a defect involving more than 45% of the humeral head.^[15] However, recent studies show that functional outcomes following shoulder arthroplasty may be poorer than the outcomes obtained through successful open reduction and internal fixation.^[12] In young patients with a humeral head defect larger than 50%, open reduction and stabilization with bone graft should be the first choice of treatment.^[10]

There are many case reports in the literature and orthopedic textbooks involving surgical treatment and follow-up of posterior shoulder fracture dislocations due to high-energy traumas, such as epileptic seizure, electrocution, and electroconvulsive therapy. In our case, by performing a surgery using autogenic bone graft without applying internal fixation material, we obtained a successful outcome and avoided complications associated with internal fixation material.

Since the long-term follow-up results of our patient were perfect, we believe that repair of the humeral head defect by methods sparing the anatomical structure of the humeral bone, such as reconstruction of the defective area of the humeral head in reverse Hill-Sachs lesion, should be regarded as an alternative for arthroplasty or non-anatomical surgical intervention in patients with a healthy bone structure having no osteoarthritis.

Conflicts of Interest: No conflicts declared.

References

1. Cicak N. Posterior dislocation of the shoulder. *J Bone Joint Surg Br* 2004;86:324-32.
2. Robinson CM, Aderinto J. Posterior shoulder dislocations and fracture-dislocations. *J Bone Joint Surg Am* 2005;87:639-50.
3. Claro R, Sousa R, Massada M, Ramos J, Lourenço JM. Bilateral posterior fracture-dislocation of the shoulder: report of two cases. *Int J Shoulder Surg* 2009;3:41-5.
4. Constant CR, Murley AH. A clinical method of functional assessment of the shoulder. *Clin Orthop Rel Res* 1987;(214):160-4.
5. Wadlington VR, Hendrix RW, Rogers LF. Computed tomography of posterior fracture-dislocations of the shoulder: case reports. *J Trauma* 1992;32:113-5.
6. Aparicio G, Calvo E, Bonilla L, Espejo L, Box R. Neglected traumatic posterior dislocations of the shoulder: controversies on indications for treatment and new CT scan findings. *J Orthop Sci* 2000;5:37-42.
7. Brackstone M, Patterson SD, Kertesz A. Triple "E" syndrome: bilateral locked posterior fracture dislocation of the shoulders. *Neurology* 2001;56:1403-4.
8. McLaughlin HL. Posterior dislocation of the shoulder. *J Bone Joint Surg Am* 1952;24:584-90.
9. Keppler P, Holz U, Thielemann FW, Meinig R. Locked posterior dislocation of the shoulder: treatment using rotational osteotomy of the humerus. *J Orthop Trauma* 1994;8:286-92.
10. Gerber C. Chronic, locked anterior, and posterior dislocations. In: Warner JJP, Iannotti JP, Flatow EL, editors. *Complex and revision problems in shoulder surgery*. 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 2005. p. 89-103.
11. Gerber C, Lambert SM. Allograft reconstruction of segmental defects of the humeral head for the treatment of chronic locked posterior dislocation of the shoulder. *J Bone Joint Surg Am* 1996;78:376-82.
12. Robinson CM, Akhtar A, Mitchell M, Beavis C. Complex posterior fracture-dislocation of the shoulder. Epidemiology, injury patterns, and results of operative treatment. *J Bone Joint Surg Am* 2007;89:1454-66.
13. Ozkan M, Gul O, Bacakoglu K, Ozcan C, Ekin A. Treatment of posterior locked fracture dislocation of the shoulder with hemiarthroplasty. [Article in Turkish] *Acta Orthop Traumatol Turc* 2000;34:45-9.
14. Alta TD, Willems WJ. Bilateral posterior fracture-dislocation of the shoulder managed by allograft reconstruction of the segmental defect: report of two cases. *Eur J Orthop Surg Traumatol* 2008;18:81-5.
15. Hawkins RJ, Neer CS 2nd, Pianta RM, Mendoza FX. Locked posterior dislocation of the shoulder. *J Bone Joint Surg Am* 1987;69:9-18.