

Modified mclaughlin technique for neglected locked posterior dislocation of the shoulder: A case report

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ABSTRACT

Posterior dislocation of the glenohumeral joint is a rare injury accounting 2-4% of all shoulder dislocation and its annual incidence is 0.6% in 100000. This case report is related to neglected posterior shoulder dislocation after an electric shock which was treated by the modified Mc-Laughlin technique after 2 months of injury. Several surgical techniques have been described for the treatment of posterior shoulder dislocation depending on the time elapsed between the injury and diagnosis and the presence of the humeral head impression fracture. Common treatment methods include McLaughlin procedure, filling of defects with allograft or autograft, glenoid augmentation and shoulder prosthesis. Using this technique, the shape of the humeral head was nearly restored with the impaction of autograft from the iliac crest and transfer of lesser tuberosity along with subscapularis into the defect created due to the impaction of the humeral head against glenoid margins.

Keywords: Joint, Posterior dislocation, Shoulder.

Posterior dislocation of the glenohumeral joint is a rare injury accounting for 2-4% of all shoulder dislocation with an annual incidence is 0.6% in 100,000 [1]. Due to the lack of critical physical examination and inadequate radiographs or insufficient radiographic reading skills of the attending physician, these injuries are often missed [2,3]. Most of the posterior shoulder dislocations have been attributed to high energy trauma, seizures or electroconvulsive therapy/ electric shock [4].

They may be associated impression fracture of the anteromedial humeral head (also called 'reverse Hill-Sachs lesion' [RHL]) in 40% to 90% of patients with an initial dislocation [5-9]. Routine radiograph of the shoulder antero-posterior (AP) and axial views are often misleading to arrive at a diagnosis as AP radiograph may not reveal the dislocation and axial view is sometimes not possible due to inability of the patient to do abduction. Computed tomography (CT) scan can identify the injury well, quantify the involvement of the articular surface of the humeral head and identify fractures of the tuberosity, surgical neck, and glenoid. Magnetic resonance imaging (MRI) has been widely used to reveal posterior cuff tears and posterior avulsion lesions. Here we present the case of a patient with neglected posterior dislocation of shoulder operated with Modified Mc-Laughlin technique.

CASE REPORT

A 42-year-old male presented in orthopedic OPD of AIIMS Rishikesh with complaints of right shoulder stiffness and deformity for 2 months. The patient was apparently asymptomatic

when he had an episode of electric shock on the right upper limb 2 months back and developed pain, swelling, and deformity. The patient went to a local practitioner where conventional X-rays of the shoulder were done. Not recognizing the injury on the initial AP radiograph, the patient was advised analgesics and sling for the upper limb. Finding no relief, the patient went to a quack and got massage done over the same shoulder but the deformity persisted and stiffness increased over time.

On examination, the respiratory, cardiovascular and nervous systems were within normal limits. The patient's vitals were stable and within normal limits. On local examination, the right upper limb was in the attitude of adduction and internal rotation, holding the upper limb close to the body. The opposite movements of abduction and external rotation were not possible. Deltoid contour was lost and abnormal mass of humeral head was palpated posteriorly



Figure 1: Anteroposterior radiographs of the right shoulder showing loss of the glenohumeral joint line parallelism and shoulder fixed in internal rotation with typical light bulb sign.

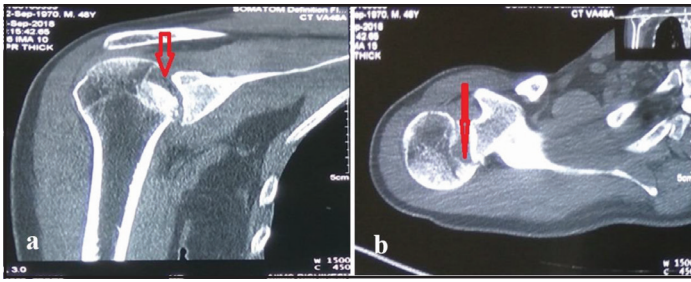


Figure 2: Computed tomography scan on (a) sagittal cut showed anteromedial defect in the humeral head; (b) axial cut showed dislocated gleno-humeral joint with most of the articular surface of the humeral head lying posterior to the glenoid margin with defect in the humerus locked into the glenoid.

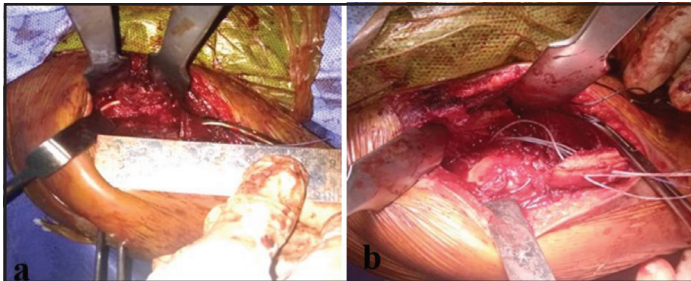


Figure 4: Intraoperative picture of measurement of defect and passing suture anchor.

which was moving with further adduction of the shoulder. Distal neurovascular status was intact in the form of active finger and wrist movement with palpable radial and ulnar artery.

Preoperative investigations were done in the form of AP radiographs of the shoulder joint (Fig. 1) which showed a typical light bulb sign. Axial radiographs were not possible due to the locking of the shoulder in adduction. CT scan delineated the locked posterior shoulder dislocation (Fig. 2a). The impaction fracture of the anteromedial aspect of the humeral head was measured on scans performed in the horizontal plane at the level of the largest diameter of the head. It was expressed in the percentage of the projected total articular surface and calculated to be more than 30% (Fig. 2b).

For the surgery, the patient was kept under general anesthesia and in the beach-chair position; parts were prepared, painted and draped. Then standard deltopectoral approach was used to expose the shoulder joint. A longitudinal incision approximate

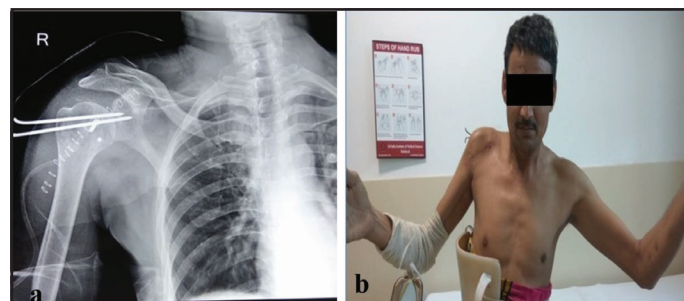


Figure 6: (a) Postoperative day 4th anteroposterior radiographs showing the shoulder immobilized with 2 k-wire, and 1 cannulated cancellous screw with suture anchor; (b) Postoperative day 42 before removal k-wire.



Figure 3: Intraoperative c-arm image showing 2 k-wire has passed from the head of humerus to glenoid to stabilize the joint.

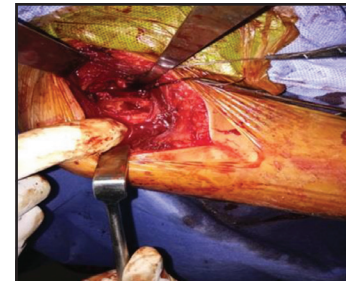


Figure 5: Intraoperative picture showing suture anchor and screw fixing the lesser tuberosity in the defect of the head of humerus.

12 cm given along the deltopectoral groove, plane developed between the deltoid and pectoralis muscle, the short head of biceps brachii and coracobrachialis are retracted medially. Lesser tuberosity could not be reached due to locked internal rotation of the shoulder. A Schanz pin was passed into the humerus head and the head was delivered out into the wound by traction and external rotation and pushing the head from the posterior side. Once the head was reduced, the lesser tuberosity was identified. The head was fixed with glenoid with trans-articular K wires (Fig. 3). The lesser tuberosity was osteotomized with the subscapularis tendon attached and grafted into the defect of the humeral head along with iliac crest graft and fixed with an anchor suture and augmented with a screw (Fig. 4 and 5). The lesser tuberosity so attached along with the iliac crest graft acted as a strong checker for the internal rotation and re-dislocation of the shoulder.

Postoperative rehabilitation included immobilization of the shoulder with an external rotation brace for 6 weeks. The patient

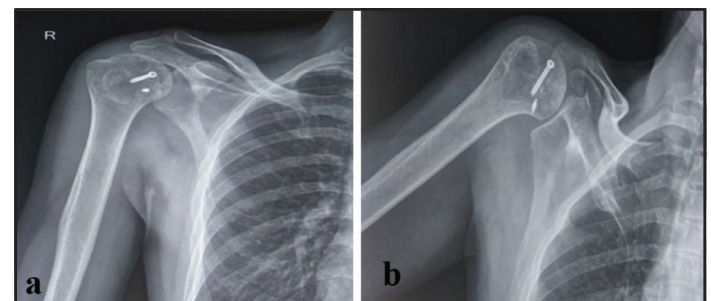


Figure 7: Postoperative day 120 anteroposterior and axillary radiographs of the shoulder with suture anchor and c screw in place.



Figure 8: Clinical picture of the patient combing his hair 4 months after the procedure.

was followed up in orthopedics OPD at 4 weeks, 8 weeks, 12 weeks and 6 months for subsequent rehabilitation and to evaluate the function at the shoulder. On a postoperative day 42, transarticular K wires were removed and the patient was sent on shoulder immobilizer and advised to start Codman pendular exercises and external rotation exercises (Fig. 6, 7). The patient was then called after 6 weeks interval and assessed for the function of the shoulder on Disabilities of Arm, Shoulder and Hand (DASH) score and pain on Visual Analogue Scale (VAS) score. After 4 months of follow-up, the patient had significant improvement in range of motion at the shoulder joint and a significant decrease in pain (Fig. 8) (Table 1).

DISCUSSION

Posterior dislocation of the shoulder is an uncommon injury. The rarity and high rate of misdiagnosis of this injury led McLaughlin [10] to call it a diagnostic trap. The management of this injury must be decided depending on the amount of the defect of the humeral head and the time from injury. The size of the humeral head impaction fracture is key to the decision process. Defects of the articular surface of the humeral head up to 25% in patients with dislocations less than 3 weeks old can be treated by closed reduction and immobilization in external rotation; however, for chronic dislocations (older than 3 weeks), closed reduction is highly unsuccessful [11]. Defects larger than 50% of the articular surface should be treated with shoulder arthroplasty [12].

The management of defects between 25% and 50% is more challenging [13]. McLaughlin was the first surgeon to recognize the importance of the impaction fracture of the humeral head in patients with a shoulder dislocation and recommended a subscapularis tendon transfer into the defect.

More secure fixation of the subscapularis tendon into the defect can be obtained through the modification of McLaughlin's technique described by Hawkins *et al* [14]. They recommended the transfer of the lesser tuberosity with the attached subscapularis tendon into the defect and reported excellent results in 4 patients. Charalambous *et al* [15], in 2008, described another modification of McLaughlin's technique where they plicated the subscapularis tendon into the humeral head defect using suture anchors rather

Table 1: Assessment for the function of shoulder using DASH score and VAS score.

	QUICK DASH (out of 55)	VAS (out of 10)
At presentation		8
2 weeks postoperative	16	5
6 weeks postoperative	28	4
3 months postoperative	40	1
4.5 months postoperative	50	0

DASH: Disabilities of Arm, Shoulder and Hand; VAS: Visual Analogue Scale

than detachment and reattachment of the tendon into the defect. This method can compromise an eventual secondary prosthetic reconstruction and may lead to limitation of internal rotation of the shoulder joint.

Anatomical restoration of the humeral head surface has also been described by allograft impaction and fixation with suture anchors. Kokkalis *et al* [8] suggested the use of morselized bone allograft, suture anchors, lesser tuberosity with the attached subscapularis tendon transfer into the defect to restore the shape of the humeral head. Other authors described allograft reconstruction of the humeral head and rotational osteotomy of the proximal humerus. However, the latter technique has not gained popularity due to technical difficulties and the risk of devascularization of the humeral head.

CONCLUSION

To prevent the deformity in posterior shoulder dislocation, we must be vigilant to pick up the deformity by radiograph or by computed tomography. Also, create awareness in the population to visit the hospital as early as possible to have a clear diagnosis and prevent further deformity and avoid surgical intervention. In cases of posterior dislocation of the shoulder with a reverse Hill–Sachs lesion between 25% and 45%, the modified McLaughlin procedure demonstrates excellent clinical and radiographic results.

REFERENCES

- Perron A, Jones R. Posterior shoulder dislocation: Avoiding a missed diagnosis. *Am J Emerg Med.* 2000;18:189-91.
- Kaar TK, Wirth MA, Rockwood CA. Missed Posterior Fracture-Dislocation of the Humeral Head. *J Bone Joint Surg Am.* 2000;82:1364-5.
- Xu W, Huang L, Guo J, Jiang D, Zhang Y, Yang H. Neglected posterior dislocation of the shoulder: A systematic literature review. *J Orthop Translat.* 2015;3:89-94.
- Kowalsky MS, Levine WN. Traumatic Posterior Glenohumeral Dislocation: Classification, Pathoanatomy, Diagnosis, and Treatment. *Orthop Clin North Am.* 2008;39:519-33.
- Shams A, El-Sayed M, Gamal O, ElSawy M, Azzam W. Modified technique for reconstructing reverse Hill–Sachs lesion in locked chronic posterior shoulder dislocation. *Eur J Orthop Surg Traumatol.* 2016;26:843-9.
- Castagna A, Delle Rose G, Borroni M, Markopoulos N, Conti M, Maradei L, *et al.* Modified macLaughlin procedure in the treatment of neglected posterior dislocation of the shoulder. *Chir Organi Mov.* 2009;93(Suppl 1):S1–5

7. Abdel-Hameed SK, Alzalabany AKAI, Abdel-Aal MA, Soltan AA. Reconstruction of Humeral Head Defect in Locked Posterior Dislocation Shoulder. A Case Series of Nine Patients. *Open J Orthopedics*. 2015;05:25-33.
8. Kokkalis ZT, Mavrogenis AF, Ballas EG, Papanastasiou J, Papagelopoulos PJ. Modified McLaughlin Technique for Neglected Locked Posterior Dislocation of the Shoulder. *Orthopedics*. 2013;36:e912-6.
9. Martinez AA, Navarro E, Iglesias D, Domingo J, Calvo A, Carbonel I. Long-term follow-up of allograft reconstruction of segmental defects of the humeral head associated with posterior dislocation of the shoulder. *Injury*. 2013;44:488-91.
10. McLaughlin H. Posterior Dislocation Of The Shoulder. *JB & JS*. 1962;44:1477.
11. Cicak N. Posterior dislocation of the shoulder. *J Bone Joint Surg Br*. 2004;86:324-32.
12. Loebenberg M, Cuomo F. The Treatment Of Chronic Anterior And Posterior Dislocations Of The Glenohumeral Joint And Associated Articular Surface Defects. *Orthop Clin North Am*. 2000;31:23-34.
13. Schliemann B, Muder D, Gessmann J, Schildhauer TA, Seybold D. Locked posterior shoulder dislocation: treatment options and clinical outcomes. *Arch Orthop Trauma Surg*. 2011;131:1127-34.
14. Hawkins RJ, Neer CS 2nd, Pianta RM, Mendoza FX. Locked posterior dislocation of the shoulder. *J Bone Joint Surg Am*. 1987;69:9-18.
15. Charalambous CP, Gullett TK, Ravenscroft MJ. A modification of the McLaughlin procedure for persistent posterior shoulder instability: technical note. *Arch Orthop Trauma Surg*. 2008;129:753-5.

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