

A Case Report of Posterior Shoulder Dislocation with Greater Tuberosity Fracture

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Purpose: Posterior shoulder dislocation with fracture of greater tuberosity of the humerus is extremely rare. Therefore, the best prescribed treatment for it has not yet been established.

Methods: A 45-year-old male, the victim of motorcycle accident, presented with shoulder injury and deformity. Post injury radiographs demonstrated a posterior shoulder dislocation and hollow glenoid with bony fragments. Computed tomographic findings revealed a posterior shoulder dislocation with fracture of greater tuberosity of the humerus. A closed reduction procedure was successfully performed under general anesthesia.

Results: Anatomical reduction of shoulder joint and greater tuberosity fragment was achieved with good joint stability.

Conclusion: Closed reduction under general anesthesia is an effective treatment for posterior dislocation with fracture of greater tuberosity.

Keywords: Posterior shoulder dislocation, greater tuberosity, case report

The Thai Journal of Orthopaedic Surgery: 42 No.1-2: 18-22

Full text. e journal: <http://www.rcost.or.th>, <http://thailand.digitaljournals.org/index.php/JRCOST>

Introduction

Posterior dislocation of the shoulder is a rare injury and represents approximately 2-5% of all traumatic shoulder dislocations^(1,2). The overall incidence of posterior fracture-dislocations was 0.6 per 100,000 populations per year. The peak incidence was in middle-aged men, and most injuries were sustained during a seizure or a fall from a height. In most patients, there was a displaced primary fracture of the anatomic neck of the humerus, propagating from the area of an osteochondral fracture of the anterior aspect of the humeral head (a reverse Hill-Sachs lesion). Recommended treatment is open relocation of the humeral head with bone-grafting of humeral head defects, and internal fixation of the fracture. The combination of a greater tuberosity fracture with ipsilateral posterior glenohumeral dislocation is an even rarer event, for which there has been no reported treatment.

Almost of previous case reports of shoulder dislocation involved delayed diagnosed entities, which led to unsatisfactory patient outcome. A high index of suspicion and early diagnosis by adequate clinical radiological examination are required to prevent osteonecrosis of the humeral head, and to ensure satisfactory joint functional recovery.

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Case report

A 45-year-old male was referred to Khon Kaen Hospital after a road traffic accident. The patient was struck by a car while riding a motorcycle. He complained of pain and deformity over the right shoulder. Physical examination revealed an internally rotated and slightly adducted deformity of the injured limb, with limited motion in any direction. The posterior area of the shoulder was swollen and tender. There was no distal neurovascular deficit or associated injury. Plain radiographs revealed a posterior shoulder fracture dislocation with large bony fragments around the humeral head, which was not clearly identified (Fig.1-A, 1-B).

A U slab was then applied, and the patient was taken to the operating room within 48 hours. Under general anesthesia, closed reduction was successfully performed. The patient was positioned in supine, and the injured arm was then placed in traction, with the elbow pointing caudally. Then, through maintained traction and internal rotation reduction force, the medial side of the upper arm was pushed laterally using the leverage technique⁽³⁾, causing the humeral head to detach from the glenoid rim. The shoulder was then rotated externally, and joint reduction was achieved. After reduction, the shoulder's range of motion was full, with no clinical re-dislocation or instability present. Intraoperative fluoroscopic findings showed anatomic reduction of the shoulder joint and anatomically reduced greater tuberosity (Fig.3-A, 3-B). The shoulder was then immobilized with a sling 2 weeks then start pendulum exercise and progressive range of motion exercise.

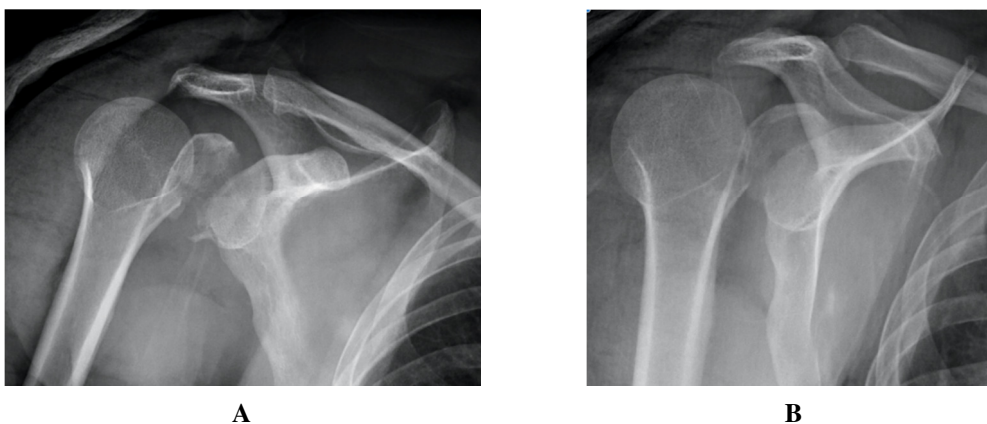


Fig.1-A film shoulder AP view, Fig.1-B film shoulder lateral scapular (Y view)

Preoperative radiographs show a posterior shoulder dislocation with large bony fragments, in which internal rotation deformity was also demonstrated.

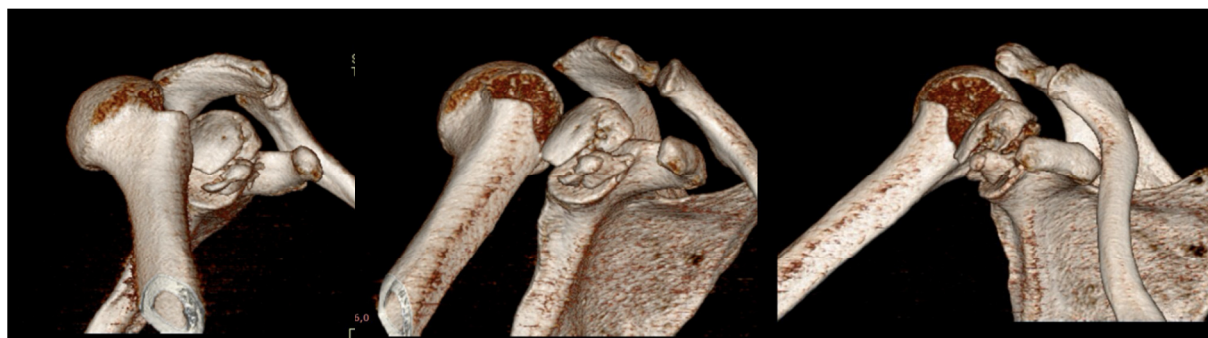


Fig.2 Computed tomographic 3D reconstruction findings demonstrate the more clearly identifiable posterior shoulder dislocation and greater tuberosity fracture.

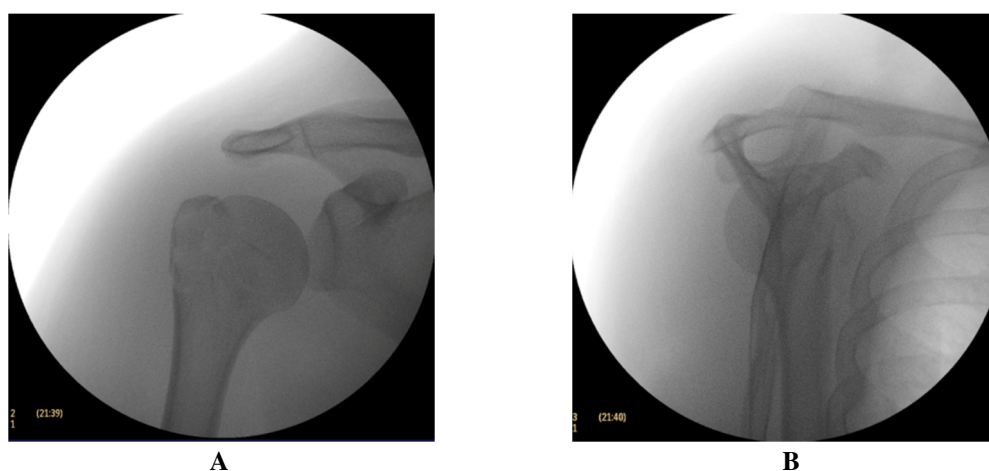


Fig.3-A film shoulder AP view, Fig.3-B film shoulder lateral scapular (Y view)

Intraoperative fluoroscopic findings show an anatomic reduction of the shoulder joint and greater tuberosity fragments.

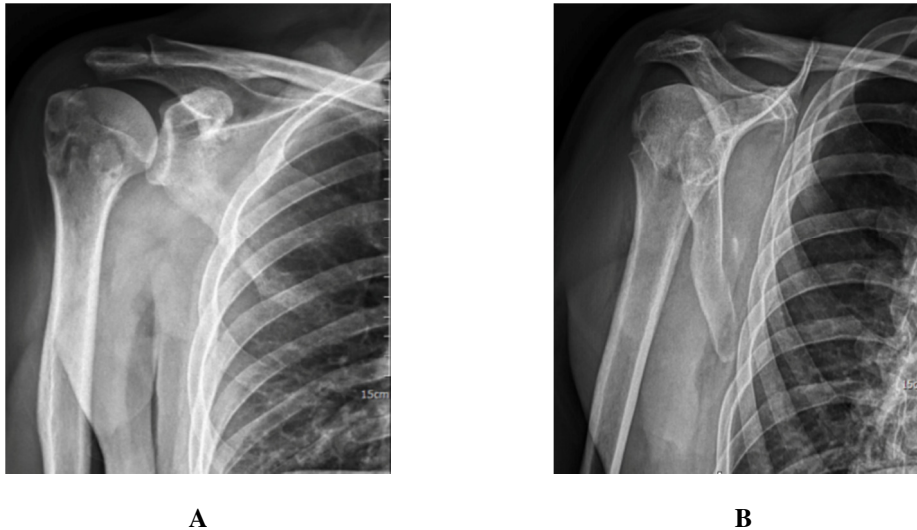


Fig.4-A film shoulder AP view, Fig.4-B film shoulder lateral scapular (Y view)

After Eight week post-operative radiographic findings demonstrated the maintainable alignment and some union (Fig.4-A,4-B). Painless shoulder movement with satisfied range of motion were achieved.

Discussion

Posterior shoulder dislocation is a rare injury. The three most common causes of posterior shoulder dislocation include a fall on the outstretched arm, a direct blow to the anterior aspect of the shoulder during an epileptic seizure, and electrocution or ECT (electroconvulsive therapy)⁽⁴⁻⁹⁾. Posterior dislocation of the shoulder is four times more common in males, with up to 65% of patients having associated injuries; which include fractures of the humeral neck (18.5%), lesser (14.3%) and greater (7.8%) tuberosity, reverse Hill-Sachs lesion (29%), and rotator cuff tear (2%)⁽⁴⁾. Closed reduction under general anesthesia provides anatomical reduction.

Inadequate radiographs and poor physical examination are the main factors of misdiagnosis. The classic physical findings of posterior dislocation include decreased anterior prominence of the humeral head, palpable posterior prominence of the humeral head, palpable prominence of the coracoid, marked limit of abduction, and complete absence of external rotation with a fixed internal rotation deformity⁽¹⁰⁾. Radiographs in AP, scapular Y, and axillary views are necessary; and the Velpeau axillary view is also useful⁽¹¹⁾. Several signs indicating posterior dislocation of the shoulder within the AP view have been described, including the positive rim sign and absence of the half-moon overlap⁽¹²⁾, the light-bulb sign, and the trough line⁽¹³⁾. If any suspicion arises, computed tomography (CT) scan can discover a posterior

shoulder dislocation, as well as define the extent of the displacement and the osseous abnormalities.

Previous studies have shown that the conventional closed reduction technique was successful in 42% of cases in a series of 12 fresh posterior dislocations. The main factors leading to unsuccessful closed reduction were tight locking of the glenohumeral joint due to a large impression fracture, delayed diagnosis of the dislocation, and anatomical neck fracture^(14,15). Soft-tissue lesions of the infraspinatus⁽¹⁶⁾ and/or bicep tendon interposition are some additional factors preventing successful closed reduction. In this case, closed reduction could be successfully performed because of the absence of reverse Hill-Sachs lesion which able to be an obstacle. Furthermore, this case was not a complex posterior shoulder fracture-dislocation by definition from Robinson M et al.⁽¹⁷⁾

Posterior shoulder dislocations are a common unrecognized injury. Hawkins et al., 1989; explained the delay in diagnosis by an average of one year in 75% of the cases studied⁽¹⁸⁾. Causes of delay in diagnosis included failure of the evaluating physician to include the condition in the differential diagnosis, suboptimal radiographic evaluation and interpretation, and coincidental injuries; such as fractures that can confound the patient's presentation. A delay in diagnosis and treatment of posterior shoulder dislocation or fracture-dislocation has increased risks of non-union, subsequent humeral head collapse, avascular necrosis, post-traumatic arthritis, and muscle wasting.

Conclusion

Posterior shoulder dislocation associated with fracture of the greater tuberosity is a rare injury. Closed reduction under general anesthesia can be the one of choice of treatment.

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รายงานผู้ป่วย ภาวะหัวไหล่หลุดหลังร่วมกับกระดูก *greater tuberosity* หักในข้างเดียวกัน

ศุภมงคล มัชฌิ, พบ, วันจักร พงษ์สมัครไทย, พบ

ภาวะหัวไหล่หลุดหลังพบได้ไม่บ่อย โดยเฉพาะไหล่หลุดหลังที่พบร่วมกับกระดูก *greater tuberosity* หักนั้น แทบจะไม่พบ รายงานผู้ป่วยส่วนใหญ่ภาวะไหล่หลุดหลังมักได้รับการวินิจฉัยล่าช้าหรือวินิจฉัยพลาด ทำให้ผลการรักษาไม่ดี ดังนั้นจำเป็นที่จะต้องซักประวัติ ตรวจร่างกาย และอ่านภาพรังสี ให้ถูกต้องเพื่อวินิจฉัยภาวะนี้

ผู้ป่วยชายอายุ 45 ปี ได้รับอุบัติเหตุถูกรถยนต์ชน ปวดไหล่ขวา ตรวจร่างกายพบว่ามีไหล่ขวาผิดรูป แขนขาชิด ลำตัวและหมอนเข่าด้านใน ด้านหลังของไหล่นวมขึ้น ไม่สามารถเหยียดได้ ตรวจระบบอื่นปกติ ภาพรังสี แสดงว่ามี *proximal humerus fracture* และมีกระดูกชิ้นใหญ่ขวางแนวข้อไหล่ และสงสัยไหล่หลุดหลัง จึงได้ส่งเอกซเรย์คอมพิวเตอร์เพื่อยืนยัน พบว่ามีไหล่หลุดหลังและมี *greater tuberosity* หัก

การรักษาในเบื้องต้นได้ใส่ *arm sling* และนำผู้ป่วยเข้าห้องผ่าตัดได้รับการดมยาสลบและได้ดึงไหล่ให้เข้าที่ หลังดึงพบว่าข้อไหล่มั่นคงดี และภาพรังสีแสดงกระดูก *greater tuberosity* เข้าที่ และข้อไหล่เข้าที่ดี

ภาวะหัวไหล่หลุดหลังที่พบร่วมกับกระดูก *greater tuberosity* หัก สามารถรักษาโดยการดึงไหล่ภายใต้การดมยาสลบ
