

# Which Comes First in Posterior Shoulder Dislocation; X-Ray or Computed Tomography?

## Posterior Omuz Çıkığında Hangisi Önceliklidir: X-Ray ya da Bilgisayarlı Tomografi?

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### ABSTRACT

The glenohumeral joint is the most commonly dislocated joint in the human body. Anterior dislocation is the most common type and posterior dislocations account for <1% of shoulder dislocations. A 28-year-old man was brought to the emergency department by ambulance after a high-velocity motor vehicle accident. At the time of admission he was suffering left shoulder pain. On local physical examination, there was severe pain on the proximal humerus. The left arm was in internal rotation in the adducted position. Radiographs of his left shoulder were performed and no significant pathology was identified in the left shoulder anteroposterior X-ray. Axillary radiography could not be performed because of painful arm movements. Therefore we performed a computed tomography scan, instead of X-ray. The success rate of diagnosing the posterior shoulder dislocations with X-ray is very low. We believe that X-ray, as a primary imaging method, will cause delay in the diagnosis for this group of patients. In the case of suspicion of posterior shoulder dislocations, computed tomography should be the first choice of investigation rather than X-ray.

**Keywords:** Posterior shoulder dislocation, closed reduction, computed tomography, X-Ray

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### ÖZET

İnsan vücudunda en sık çıkan eklem, glenohumeral eklemdir. Anterior en sık tipidir ve arka yöne doğru olan çıkık omuz çıkıklarının %1'inden azını oluşturur. Yirmi sekiz yaşında bir erkek hasta yüksek hızlı trafik kazası sonrası ambulansla acil servise getirildi. Geldiğinde sol omuzunda ağrı vardı. Bölgesel fizik muayenesinde humerusun proksimalinde şiddetli ağrı vardı. Kolu adduksiyonda ve internal rotasyonda idi. Sol omuz radyografileri çekildi ve sol omuz anteroposterior grafide önemli patoloji saptanmadı. Kol hareketlerindeki ağrı nedeniyle aksiller radyografi çekilemedi. Bu yüzden biz grafi yerine bilgisayarlı tomografi yaptık. Grafiyle posterior omuz çıkıkları tanısının başarı oranı azdır. Biz bu hastalarda ilk görüntüleme yöntemi olarak grafinin, tanıda gecikmeye neden olacağına inanıyoruz. Posterior omuz çıkığından şüphelenilen vakalarda ilk seçenek, grafi yerine bilgisayarlı tomografi olmalıdır.

**Anahtar Kelimeler:** Posterior omuz çıkığı, kapalı redüksiyon, bilgisayarlı tomografi, X-Ray

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## INTRODUCTION

The glenohumeral joint is the most commonly dislocated joint in the human body (1). Anterior dislocation is most common type and posterior dislocations (PD) account for <1% of shoulder dislocations. Others include inferior (*luxatio erecta*; <0.5%) and superior (very rare) (2, 3).

The usual mechanism of PD is an indirect force that produces forceful internal rotation and adduction. This may occur during a fall or from violent muscle contraction due to a seizure or electric shock. The patient will be unable to externally rotate or abduct the affected arm. The arm is adducted and internally rotated (3).

The diagnosis of PD is often missed. Prompt diagnosis and reduction of a PD is important to prevent osteonecrosis of the humeral head. However, in view of its rarity and diagnostic difficulty, it is often diagnosed and treated late, and X-rays are often inadequate in diagnosis (4). X-ray diagnosis by films taken in anteroposterior projections is difficult and at times impossible. The absence of abduction prevents satisfactory roentgenography through the axilla and transthoracic roentgenograms often are insufficient (5).

Computed Tomography (CT) is very useful in evaluating the size of the defect in the humeral head and associated glenoidal changes. Magnetic Resonance Imaging (MRI) is not necessary because soft-tissue injuries are very rare in PD of the shoulder (6).

We report a PD case in whom dislocation of the shoulder could not be diagnosed by X-ray and was demonstrated with CT.

## CASE REPORT

A 28-year-old man was brought to the emergency department by ambulance after a high-velocity motor vehicle accident. At the time of admission he was conscious, oriented and cooperative; and was suffering left shoulder pain. He stated that his shoulder was slammed into the steering wheel during the accident.

On initial examination in the emergency room, vital signs were as follows: heart rate 90 beats per minute, blood pressure 130/80 mmHg, respiratory rate 18 breaths per minute and temperature (axillary) 36.6°C. On local physical examination, there was

severe pain on the left proximal humerus. The left arm was in internal rotation in the adducted position. Active and passive movements of the left shoulder were painful and limited. The neurovascular examination of the left upper extremity revealed no deficit. There was no pathologic finding in other system examinations.

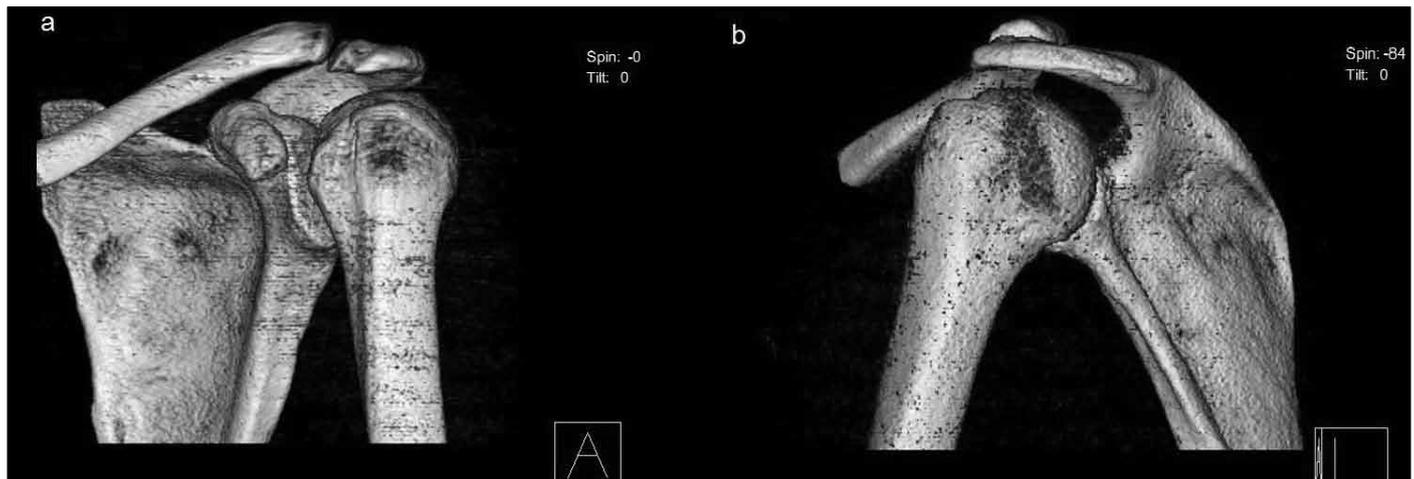
Radiographs of his left shoulder were performed and no significant pathology was identified in the left shoulder anteroposterior (AP) X-ray. Axillary radiography could not be performed because of painful arm movements. Therefore, CT and three-dimensional (3D) CT were performed to clarify any existing shoulder pathology (Figure 1a, b). Then intravenous access was provided; sedation and analgesia was maintained with intravenous 200 microgram fentanyl and 100 milligram propofol. Closed reduction under conscious sedation was performed with longitudinal and lateral traction on the arm to protect the humeral head. Control CT was performed and this revealed that reduction had improved the shoulder (Figure 2a, b). He was then treated with an arm sling and discharged with an outpatient orthopaedic control visit.

## DISCUSSION

PD of the shoulder remains a diagnostic and therapeutic challenge. It is a rare, difficult to diagnose and commonly missed injury. The diagnosis is frequently delayed or missed, in view of its rarity and paucity of tell-tale physical signs and failure to make adequate radiographs. The risk of missing PD can be minimized by careful physical examination. In these patients before X-Ray CT should be performed to better delineate the anatomy of the fracture dislocation and enable the planning of surgery (7). The standard AP view looks normal or shows only subtle abnormalities. The true AP view is difficult to interpret because there is only subluxation of the shoulder. The axillary lateral view is essential for diagnosis and estimates the size of the anteromedial defect of the humeral head. It may be difficult to obtain because of pain and limitation of abduction (6). As in our case, a clear image on X-Ray could not be performed first; then a CT scan was performed and a clear and significant image was obtained. A CT scan



**Figure 1.** 3D CT shows left shoulder posterior dislocation, 1a anterior view, 1b posterior view



**Figure 2.** 3D CT shows left shoulder after reduction of dislocation, 2a anterior view, 2b lateral view

is performed to obtain a better understanding of the glenohumeral joint and possible defects of the humeral head (8). The fracture is often associated with a PD (4). MRI is not necessary because soft-tissue injury is very rare in PD of the shoulder (6). The exquisite contrast of MRI makes it ideal for evaluation of soft tissues. Its most frequent use in skeletal imaging, therefore, is for diagnosis of injuries to muscles, tendons, or ligaments about joints. CT is superior to MRI in detecting fractures in patients with negative initial radiograph findings. CT used for evaluation provides excellent delineation of fractures (9).

Bozkurt and his colleagues performed an anteroposterior roentgenographic examination of the shoulder in a patient suspected of posterior dislocation. Hence, they could not detect any pathology, so they carried out a CT and three-dimensional (3D) CT scan on the shoulder of the patient (10). Yuen and his friends have pointed out that failure of recognition of PD by physical examination and radiography, is not an uncommon entity. They have advised CT as a gold standard diagnostic modality (11).

In order to have the optimum visualization, the appropriate position of the arm could not be provided because of the pain. Therefore we performed a CT scan, instead of X-ray.

## CONCLUSION

The success rate of diagnosing the PD with X-ray is very low. We believe that X-ray, as a primary imaging method, will cause delay in the diagnosis for this group of patient. In case of suspicion of PD, CT should be the first choice rather than X-ray.

## REFERENCES

1. Sileo MJ, Joseph S, Nelson CO, Botts JD, Penna J. Management of acute glenohumeral dislocations. *Am J Orthop (Belle Mead NJ)*. 2009; 38: 282-90.
2. Garrigues GE, Nagda SH, Yu J. Open luxatio erecta: a case report and literature review. *J Orthop Trauma*. 2011; 25: 34-7. [\[CrossRef\]](#)
3. Rudzinski JP, Pittman LM, Uehara DT. Shoulder and Humerus Injuries. In Judith E, Tintinalli MD, MS, Editor. *Emergency Medicine*. 7th ed. New York: McGraw-Hill; 2010. p.1834-8.
4. Tan AH. Missed posterior fracture-dislocation of the humeral head following an electrocution injury to the arm. *Singapore Med J*. 2005; 46: 189-92.
5. Harrison LM. Posterior dislocation of the shoulder. *J Bone Joint Surg Am*. 1952; 34: 584-90.
6. Cacak N. Posterior dislocation of the shoulder. *J Bone Joint Surg Br*. 2004; 86: 324-32. [\[CrossRef\]](#)
7. Tey IK, Tan AH. Posterior fracture-dislocation of the humeral head treated without the use of metallic implants. *Singapore Med J*. 2007; 48: 114-8.
8. Poyanli O, Gokcen B, Unay K, Akan K, Esenkaya I. Bilateral posterior shoulder dislocation with defect secondary to hypoglycemic coma. *J Orthop Sci*. 2011; 16: 125-8. [\[CrossRef\]](#)
9. Haygood TM, Sayyoub MMH. *Musculoskeletal Imaging*. Michael YM, Chen MD, Thomas L Pope, MD, David J. Ott, MD, Editors. Basic Radiology. 2nd ed. North Carolina: 2011. Chapter 6. <http://www.accessmedicine.com> Access date 03.06.2011.
10. Bozkurt M, Can F, Dogan M, Solak S, Basbozkurt M. Treatment of missed posterior dislocation of the shoulder by delayed open reduction and glenoid reconstruction with corticocancellous iliac bone autograft. *Arch Orthop Trauma Surg*. 2004; 124: 425-8. [\[CrossRef\]](#)
11. Yuen CK, Chung TS, Mok KL, Kan PG, Wong YT. Dynamic ultrasonographic sign for posterior shoulder dislocation. *Emerg Radiol*. 2011; 18: 47-51. [\[CrossRef\]](#)