A new case of opposite-direction bilateral shoulder fracture–dislocation (Case Study and Review)

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Abstract: Simultaneous dislocation of both shoulders in opposite directions is extremely rare. This case report documents the third published case, which occurred in a 57 year-old male patient during a seizure due to medicinal self-poisoning. We will also review epidemiological, pathophysiological, clinical and paraclinical data surrounding this pathology and then explore the treatment options.

Keywords: Fracture, bilateral dislocation, anterior, posterior, shoulder, joint reduction, ORIF, bone graft, prosthesis, Constant score

INTRODUCTION
Bilateral shoulder fracture–dislocations are extremely rare. Only two cases of shoulders dislocating in opposite directions have been described in published articles. We will describe a new case of opposite-direction bilateral shoulder fracture–dislocation in a 57 year-old patient following a seizure.

CASE REPORT
A 57 year-old male patient who was being treated with anti-psychotics for severe mixed anxiety–depressive disorder was admitted to the emergency ward in a comatose state, following generalized seizures that caused the patient to fall down stairs. The patient was hospitalised in intensive care with intubation. A complete clinical examination found bruising at the deltopectoral triangle of the right shoulder with oedema. Standard XR revealed an anterior fracture–dislocation of the right shoulder (figure 1). The patient underwent emergency reduction through a deltopectoral approach with ORIF of the proximal humeral using a locking plate. A comminuted fracture of the anterior edge of the glenoid was detected intra-operatively, but it could not be fixed. A coracoid bone graft (Latarjet procedure) was carried out during the same surgical procedure (figure 2). The operated shoulder was immobilised with the elbow at the body.

The patient was extubated 3 days later. At this point, the left shoulder was found to have a limited range of motion, as it was locked in adduction and internal rotation. Standard XR revealed posterior fracture–dislocation of the left shoulder, which was missed when the patient was admitted. Shoulder CT scan showed that the humeral head had significantly collapsed (less than 50% of volume remaining) but that the glenoid appeared normal (figure 3). This led us to conclude that hemiarthroplasty was indicated for this shoulder. The procedure was performed using the deltopectoral approach (figure 4).
Fig-1: Anteroposterior XR of the right shoulder reveals an anterior fracture–dislocation

Fig-2: ORIF of the proximal humerus by a locking plate associated to a coracoid bone graft

Fig-3: Radiograph and CT scan of the left shoulder reveal posterior fracture–dislocation. The humeral head is significantly collapsed
The postoperative course was marked by secondary displacement of the coracoid bone graft in the right shoulder when the patient fell again. Surgical revision was performed to add another anterior bone block using iliac crest autograft.

Six months after the procedures, the patient was satisfied with the outcome. The two shoulders were stable and pain-free. The left shoulder had very good range of motion. External rotation was limited in the right shoulder. The Constant score was 65/100 on the right side and 80/100 on the left side.

**DISCUSSION**

Bilateral shoulder fracture–dislocation is a rare finding. It was first described by Myenter et al. in 1902 [1]. In 1984, Brown et al. [2] found 90 published cases of bilateral dislocation. The most common aetiology was violent muscle contractions due to electric or epileptic causes (49%). In the case described here, the epileptic seizure was triggered by deliberate medicinal self-poisoning.


From a pathophysiology point of view, the direction of the dislocation is determined by the arm's position relative to the trunk: anterior dislocation occurs when the arm is abducted and externally rotated [7]; posterior dislocation occurs when the arm is adducted and internally rotated [8]. In our patient, the shoulders dislocated in opposite directions because each arm was in one of these positions. On the right side, anterior fracture–dislocation occurred when the patient tried to prevent himself from falling by catching hold of the handrail on the stairs with his right hand (abduction with external rotation). The epileptic seizure was responsible for the posterior fracture–dislocation on the left side.

From a clinical point of view, the diagnosis of shoulder fracture-dislocation is not always obvious, especially in comatose, polytrauma patients. Posterior dislocations are more difficult to detect [9]. It is estimated that 75% of posterior dislocations are diagnosed an average of 1 year after the injury event [10]. Because of our patient's initial level of consciousness, the diagnosis of posterior fracture–dislocation of the left shoulder was made 3 days after admission. This early diagnosis meant that we did not have to operate on a contracted shoulder.

Radiological examination is the primary means to confirm the diagnosis. But standard A/P XR can be inadequate, particularly in posterior dislocations where
the Velpeau and Bloom–Ohata views are required [11].
Standard XR do not always allow for optimal analysis
of the glenoid of the scapula, tuberosities and humeral
head. For this reason, several authors recommend
systematically performing CT scanning with 3D
reconstruction [12]. In our patient, CT scan of the right
shoulder could not be performed right away because of
the seriousness of his condition upon admission. A CT
scan of the left shoulder with reconstruction was
performed secondarily.

In terms of treatment options, this injury can be
managed with various techniques depending on the
patient’s age, amount of joint damage and diagnostic
delay [13,14,15]. If more than 20% of the humeral head
volume is damaged, Blasier [16], Gerber [17] and
Verma [18] recommend reduction, internal fixation and
reconstruction with a bone graft. Transfer of the
subscapularis tendon into the defect area using the
procedure described by McLaughlin [19] in 1952, and
modified by Neer and Hughes [20], is appropriate in
cases of posterior instability. Prosthetic joint
replacement is recommended by most authors if more
than 50% of the articular surface is damaged [21, 22].
In younger patients, hemiarthroplasty and total shoulder
arthroplasty are the last recourse. If high-quality bone is
present, a humeral head resurfacing implant is the best
alternative. Very good results have been reported with
this implant in various studies [23, 24, 25]. In our
patient, we decided to perform a conservative surgical
treatment (ORIF with bone graft) on the right side
because the patient was relatively young and the
articular surfaces were intact. On the left side, a significant collapse of the humeral head forced us to use
a hemiarthroplasty implant.

Simultaneous treatment of both shoulders
during the same procedure is recommended when the
patient’s condition allows it. Gerber et al. [26] reported
that patients operated in a bilateral manner had better
functional recovery and very few complications. This
observation also holds for bilateral shoulder fracture–
dislocation treated by prosthesis [27,28]. Because our
patient was admitted in critical condition, two-stage
surgery was mandatory, even if the left shoulder’s
posterior fracture–dislocation had been detected
initially.

In terms of outcomes, various authors [15, 28,
29] have described encouraging observations with very
satisfactory functional recovery, independent of
the treatment selected; however none of these studies
directly compared various treatment options. Begin et
al. [29] reported that a 46 year-old patient with
posterior bilateral fracture–dislocation who was treated
conservatively by humeral head reconstruction and
bone grafting had an average Constant score of 86/100
after 3 years. Alta et al. [15] evaluated two patients (38
and 41 years old) with similar injury and treatment
circumstances. At the last follow-up, the scores were 90
and 94, respectively. In two patients (64 and 76 years
old) treated with bilateral hemiarthroplasty by Allende
et al. [28], the Constant scores were 66.5 and 74.5,
respectively, after 1 year. In our 57 year-old patient
who was treated conservatively on the right side and
radically on the left side, the average Constant score
was 70/100 at the 6-month follow-up.

CONCLUSION
Simultaneous dislocation of both shoulders in
opposite directions is an extremely rare injury that is
difficult to assess on standard XRs. A CT scan should
be requested systematically. Surgical treatment options
range from conservative procedures to prosthetic
replacement. Deciding between these two techniques is
not always obvious. For this reason, preoperative
planning that takes into account the patient's general
condition, age, joint damage and diagnostic delay is
essential.

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