

# MISSED POSTERIOR FRACTURE DISLOCATION OF THE SHOULDER CLOSED REDUCTION AND PINNING

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**In four missed posterior shoulder dislocations, a trial of closed reduction was successful, but severe instability required further therapy. The glenohumeral joints were immobilized by 3 to 4 percutaneously inserted threaded pins. Removal of the pins after 4 to 6 weeks was followed by physiotherapy. After a follow-up of 4 to 42 months, the functional results of this simple procedure are good and there is no recurrence. Bending of the ends of the pins, a very careful follow-up to deal with pin migration, and adequate prevention of subsequent convulsions in epileptic patients are mandatory.**

**Keywords :** posterior shoulder dislocation ; closed reduction ; percutaneous pinning.

**Mots-clés :** luxation postérieure de l'épaule ; réduction à foyers fermés ; embrochage percutané.

## INTRODUCTION

Posterior shoulder dislocations are frequently missed, especially when the dislocation is due to convulsions (6, 8, 12). Open reduction procedures have been described (3, 12, 13). We report on four cases of successful, delayed, closed reduction, followed by percutaneous pinning.

## MATERIALS AND METHODS

In the H. Hartziekenhuis in Roeselare, Belgium, between 1989 and 1992, four patients were treated by one of the authors (B. V.) after a delayed diagnosis of a primary posterior shoulder dislocation. Three dislocations were caused by epileptic fits, and one was traumatic. All four sustained an anterior impaction fracture of the humeral head over the glenoid rim (reversed Hill-Sachs lesion). In the traumatic disloca-

tion, there was an associated subcapital fracture of the humerus. All four dislocations were missed by others, although routine radiographics had been made. The follow-up of the patients was done by the other author (J. V.).

## Operative technique

All patients were treated under general anesthesia. Adequate anteroposterior and craniocaudal fluoroscopic control necessitates an eccentric positioning of the supine patient, with the affected shoulder on a radiolucent arm support (fig. 1). A closed trial reduction was successful in all patients by applying longitudinal traction with the arm in adduction and internal rotation by one hand, assisted by posterior pressure on the humeral head by the other hand. Then stability was evaluated. In all four cases, posterior dislocation recurred easily by gravity alone or by slight, posteriorly directed pressure and necessitated additional stabilization.

While the patient was prepared and draped for percutaneous pinning, the assistant kept the humeral head in the reduced position. While the reduction was controlled fluoroscopically, the arm was brought in as much adduction and internal rotation as possible. The glenohumeral joint was fixed by 3 to 4 diverging threaded 2.5-mm pins (fig. 2). The joint was infiltrated with 2 ml Diprophos® (10 mg betamethasone dipropionate and 4 mg betamethasone dinatrium phosphate), the pin ends were bowed and covered with a sterile dressing, and the axilla was padded. The shoulder was immobilized in an adduction bandage ; one patient

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(case 1) needed a thoracobrachial splint. The position of the pins was documented by radiography immediately after the procedure.

In epileptic patients, antiepileptics were administered intravenously. The neurologist decided on the reliability of oral therapy and the moment to discontinue intravenous administration.

The patients were carefully followed both clinically and radiographically at short intervals because of the risk of pin migration. The pins were removed after 6 weeks; in one case they were removed after 4 weeks because of silent intrathoracic migration. Physiotherapy was initiated.

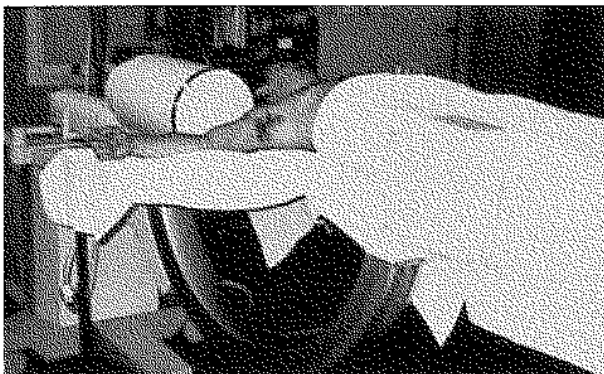


Fig. 1. — Positioning of the patient on the operating table.

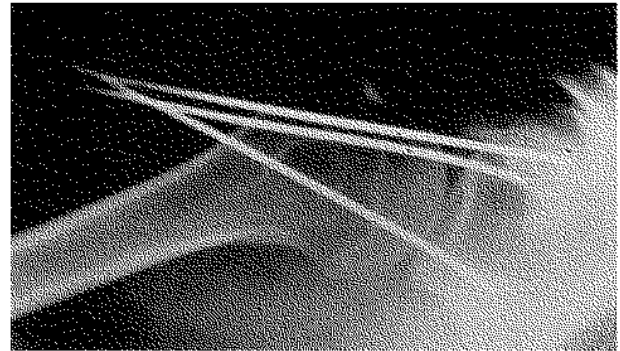


Fig. 2. — Three pins are inserted through the humeral head into the scapula in a diverging pattern. The ends are bowed.

## RESULTS

Our results are summarized in table I. All the patients resumed their previous activities. The 45 year-old patient returned to work and driving; the daily activities of three retired patients are not restricted by the injury. Two patients experience no pain; two experience intermittent pain which does not limit their activities. None of them uses analgesics chronically. There are no recurrences of dislocation.

Table I. — Details and results of closed reduction and percutaneous pinning in 4 patients

Case	Age (yr) and sex	Cause	Fracture*	Delay before operation	Analgesics	Return to work and driving (days)	pain <sup>o</sup>	Elevation in flexion (degrees)	Internal rotation (hand)	External rotation (degrees)	Duration of follow-up (months) level)
1	45 M	Road accident	Reversed Hill-Sachs 1/4 + subcapital	27	No	Yes	Mild	110	T12	15	39
2	70 M	Fit	Reversed Hill-Sachs 1/3	34	No	Irrelevant	O	135	T10	45	22
3	69 M	Fit	Reversed Hill-Sachs 1/6	3	No	Irrelevant	Mild	135	L2	30	42
4	84 M	Fit	Reversed Hill-Sachs 1/3	10	No	Irrelevant	O	125	L5	20	4

\* Proportion of impacted zone relative to humeral head diameter, determined on axillary radiography or CT-scan; <sup>o</sup> Mild, minor pain during activities; moderate, pain, which limited activities.

### COMPLICATIONS

In one patient (case 2), intrathoracic migration of one pin occurred 4 weeks after treatment. This pin had not been bent to 90°. Radiography, confirmed by CT-scanning, demonstrated that the pin had migrated to the top of the pleural cavity (figs. 3, 4). The patient had not noticed the disappearance of one pin end and had no related symptoms. All the pins were removed immediately. Fortunately, the migrated pin could be extracted under fluoroscopic control by one of its ends, positioned anteroinferiorly to the glenoid in the axillary fat. No pulmonary complications occurred. The short period of stabilization did not impede a good functional result.

### DISCUSSION

Traumatic posterior shoulder dislocations (caused by a fall or the exertion of an axial force on the outstretched arm in anteversion and internal rotation, with or without adduction (6, 11)), as well as posterior shoulder dislocations caused by convulsions (due to epilepsy, electrocution or electroshock therapy (1, 5, 6, 8, 14)), are frequently missed. However, a detailed clinical examination is often all that is necessary to lead to a high degree of suspicion, with ensuing plain X-rays confirming the diagnosis. Clinical and radiological features have been described in detail (6, 11) (figs. 6, 7, 8). Additional CT-scanning can be helpful in detailing the bony and soft tissue lesions of the glenohumeral joint (fig. 9). All patients having sustained convulsions and presenting with a painful shoulder should be thoroughly investigated as soon as possible by a specialist well acquainted with the orthopedic aspects of this problem, and one should consider the condition as a potential posterior dislocation until proven otherwise.

The longer a posterior dislocation is missed, the more difficult the treatment and the worse the prognosis (6). The failure rate of closed manipulation of missed posterior dislocations is considerable (3 out of 6 closed reduction attempts in the series of Schultz *et al.* (12)). In all four reported cases, reduction was possible; no other patients with this condition were treated in our department

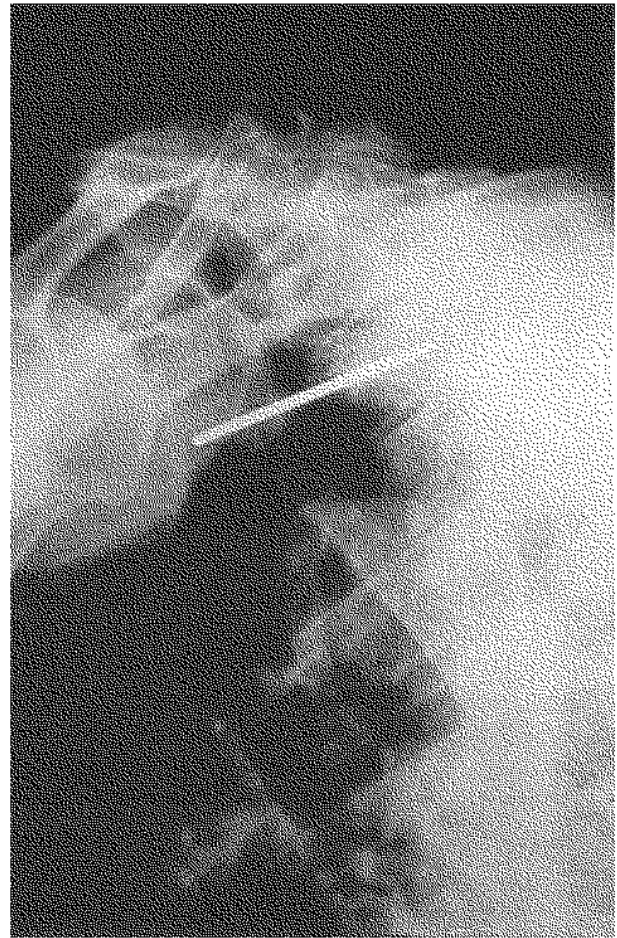


Fig. 3

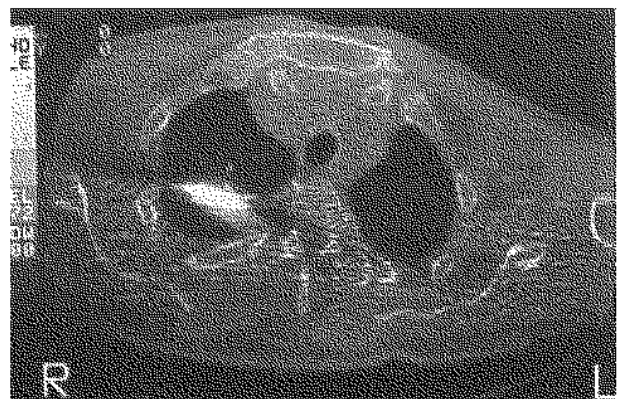


Fig. 4

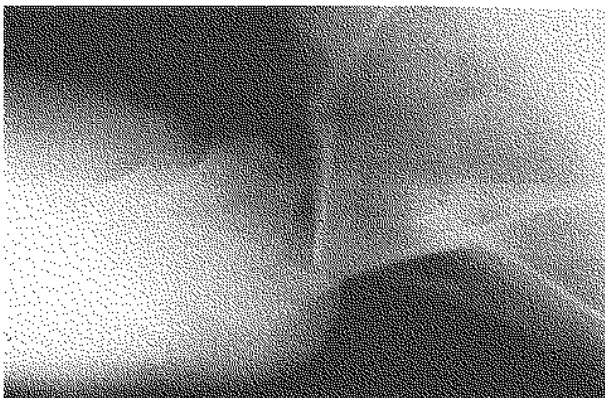
Fig. 3 and Fig. 4. — One pin migrated to the top of the pleural cavity without causing a pneumothorax.



*Fig. 5.* — Posterior shoulder dislocation, frontal view: the humerus is internally rotated, the overlapping of the humeral head on the glenoid rim is diminished, and a reversed Hill-Sachs lesion is demonstrated.



*Fig. 6.* — Posterior shoulder dislocation, anterior oblique view (frontal view of the glenoid surface): the humeral head is centered posteriorly from the glenoid.



*Fig. 7.* — Posterior shoulder dislocation, axillary view: the humeral head is displaced posteriorly, and its anterior part is impacted on the glenoid rim (reversed Hill-Sachs lesion).



*Fig. 8.* — Posterior shoulder dislocation, CT-scan: the severity of the impaction fracture of the humeral head (reversed Hill-Sachs lesion) and the avulsion of the posterior glenoid labrum and capsule (reversed Bankart lesion) can be demonstrated.

in the same period. It remains to be clarified what time limit or which associated lesions render reduction impossible. Successful reductions 27 and 34 days after the injury suggest that a trial of reduction is worthwhile, even if the dislocation has been missed for a considerable time. Alternatives to closed manipulation are open reduction with or without a stabilization procedure, excision of the humeral head, humeral head prosthesis or acceptance of the deformity.

In all four of our case reports, the reduced shoulders were so unstable that an arm support seemed to be unsatisfactory for further treatment. The evaluation of the stability of the joint after the reduction is essential to determine further steps to be undertaken.

We are well aware that pin migration represents a substantial danger. Pins have been reported to migrate into the thoracic cavity, the mediastinum, the pericardial cavity, the trachea, the spinal canal and the spleen, with serious and sometimes lethal consequences (4). Potter *et al.* described a migration of a Kirschner wire after glenohumeral pinning. Two pins were inserted because of instability after reduction of a posterior dislocation of the right shoulder. Five days later, the pin was seen to be pulsating in the left atrium and later migrated into the spleen, necessitating laparotomy and splenectomy (9).

Lyons and Rockwood stated that pins should be used with the utmost caution, if at all, in the shoulder girdle; the importance of returning for follow-up and for removal of the pins should be explained to the patient; the ends of the pins should be bent or restraining devices should be used; intraoperative or immediately postoperative radiographs should document the placement of the pins, follow-up radiographs should be made every 4 weeks until removal and any migration should be treated by immediate removal of the pin; the patients must be followed very closely clinically and radiographically until the conclusion of therapy, at which time all pins should be removed; a migrated pin must be removed as a matter of urgency, regardless of a lack of symptoms; pins should not be used to fix the sternoclavicular joint (4). We emphasize the importance of adequate prevention of postoperative seizures,

which could not only destroy the joint but also be life-threatening. Intravenous administration of antiepileptics in the postoperative period and supervision by a neurologist are necessary in most cases. Pins should be bent 90° and cut at several centimetres from the bend. Given our case with pin migration, which was detected 4 weeks after the operation and 2 weeks after the last check-up, we find that radiographic and clinical control should be performed every 7 to 10 days.

All four patients described, accept their shoulder mobility and have no restrictions in their daily activities. None of them uses analgesics chronically. There are no recurrences of posterior dislocation. Stableforth and Sarangi, in their description of 11 cases of open reduction, consider open reduction to be the safest option when the diagnosis or treatment of a posterior dislocation or fracture-dislocation has been delayed (13). Closed reduction and temporary stabilization by threaded pins is a simple procedure and proved to be rewarding in all our cases. Three of our patients were 69 years old or more; particularly when this patient profile is taken into account, this closed type of treatment provided a pleasing result.

## CONCLUSION

Posterior shoulder dislocations are easily missed. Shoulder pain after epileptic seizures requires adequate orthopedic investigation. Even if the diagnosis is delayed, an attempt at closed reduction is worthwhile. In all four patients treated by this method severe instability persisted after reduction; percutaneous pinning of the glenohumeral joint provided adequate treatment. Pin migration can be life-threatening; adequate bending of the pins, very careful follow-up and prevention of new convulsions are mandatory.

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### SAMENVATTING

*J. VANDEPUTTE, B. VAN TORNOUT. Gemiste posterieure fraktuurluxaties van de schouder: gesloten reductie en pinning.*

Bij vier gevallen van gemiste posterieure fraktuurluxatie van de schouder lukte een poging tot gesloten

repositie, doch de belangrijke residuele instabiliteit vergde verdere behandeling. Het gleno-humerale gewricht werd geïmmobiliseerd met drie à vier percutaan aangebrachte pinnen met schroefdraad. Na vier à zes weken werden de pinnen verwijderd en werd kinesitherapie gestart. Na 4 tot 42 weken zijn de functionele resultaten van deze eenvoudige ingreep goed en trad er geen recidief op. Het is absoluut noodzakelijk het uiteinde van de pinnen om te buigen, de patiënten zeer oplettend te volgen om tijdig pinmigratie te behandelen en recidief van epileptisch insult bij epileptici te voorkomen.

### RÉSUMÉ

*J. VANDEPUTTE, B. VAN TORNOUT. Diagnostic tardif de fractures-luxations postérieures de l'épaule: réduction à foyer fermé et embrochage.*

Dans quatre cas de fracture-luxation postérieure de l'épaule, non diagnostiquée précocément, une tentative de réduction à foyer fermé réussit, mais l'instabilité de la réduction nécessita un geste complémentaire. L'articulation gléno-humérale fut stabilisée par trois à quatre tiges filetées, introduites par voie sous-cutanée. Après ablation des broches, quatre à six semaines plus tard, un traitement physiothérapeutique fut instauré. Les résultats fonctionnels furent bons et il n'y eut pas de récurrence chez ces patients suivis entre 4 et 42 mois. Il est indispensable de plier l'extrémité des broches, de suivre les patients minutieusement afin de traiter toute migration de broche et de prévenir toute récurrence de crises d'épilepsie.