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Case report

Posterior shoulder fracture-dislocation: double approach treatment. Our experience

Gennaro Fiorentino, Riccardo Cepparulo, Enricomaria Lunini, Alberto Guardoli, Luca Berni, Alberto Fontanaros, Aldo Guardoli

Department of Orthopaedics and Traumatology, Santa Maria Hospital, Borgo Val di Taro (PR), Italy

Summary. *Background:* About 4% of glenohumeral dislocations are posterior and only 1% is associated with fracture of the humeral head. Most frequent causes are high energy traumas, seizures and electrocution. The fracture and the posterior dislocation, associated with the trauma and capsular lesion can cause an important vascular damage of the humeral head. *Methods:* We describe 5 cases of posterior fracture-dislocation of the shoulder that required open reduction and internal fixation treated using double approach: posterior approach for reduction humeral head and eventually bone and capsular posterior repair and anterior approach for osteosynthesis. A Clinical examination was performed at one year and follow-up was at two years. *Conclusions:* This combined approach is less invasive, easier for dislocation reduction of the humeral head, with minimal biological damage that may occur during the reduction maneuvers. Our thought is that the posterior approach reduce vascular and bone damages during humeral head reduction and permit to suture and retention posterior capsula that is often damaged by the trauma. (www.actabiomedica.it)

Key words: posterior fracture-dislocation, combined approach, glenohumeral joint

Introduction

About 4% of glenohumeral dislocations are posterior and only 1% is associated with fracture of the humeral head. Most frequent causes are high energy traumas, seizures and electrocution.

During seizures often the dislocation is bilateral, and in relation to the duration of the crisis it can be associated with fracture of humeral trochitis or humeral head (1).

Sometimes these fractures are misunderstood since only antero-posterior radiographs are achieved in the emergency department (2).

These radiographs don't show the real anatomopathology and an axillary view is essential. Sometimes the only antero-posterior view may not show the dislocation of the humeral head and it happens that in the emergency departement axillary view is not immediately performed because of the patient's pain so happen to make mistakes in diagnosis incurring in fatal error as shown in Figure 1 (antero-posterior view). In Figure 2 (axillary view) of the same patient it can clearly seen the dislocation that is not so clear in Figure 1.

Because of the difficulty of the diagnosis, could happen that the treatment is delayed. A careful examination shows an important functional impairment, a intrarotation of the arm and inhability to abduct and to elevate the limb (2,3).

Due to the important pain often it's impossible to manually reduce the dislocation, also for the interposition of the anterior capsule and the glenoid during the reduction.

The fracture and the posterior dislocation, associated with the trauma and capsular lesion can cause an important vascular damage of the humeral head.

Figure 1. Example of shoulder X-Ray in antero-posterior and axillary view

Figure 2. Example of shoulder X-Ray in antero-posterior and axillary view

These traumas should be treated in emergency to reduce the risk of avascular necrosis of the head (4,5).

The most frequent approach is the deltopectoral approach with reduction of the head and synthesis of the fracture with plate and screws.

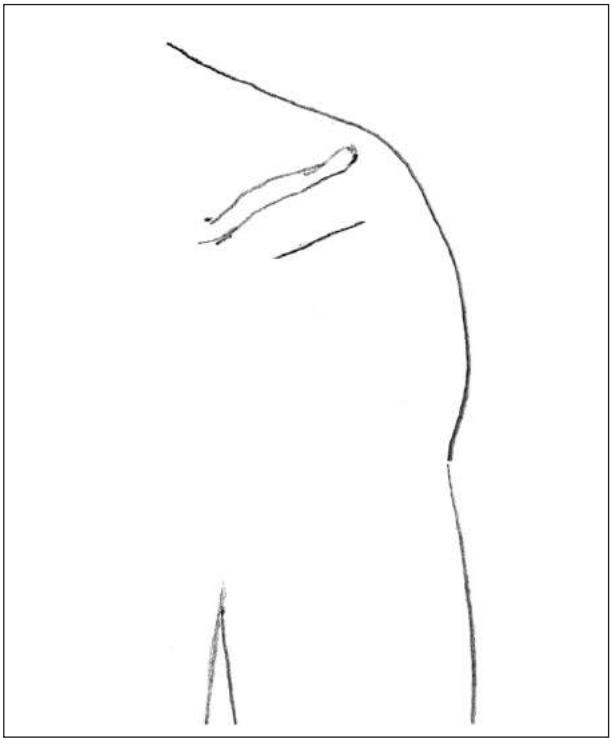

Figure 3. Posterior approach

Figure 4.

Figure 5. Example of shoulder X-Ray in antero-posterior and axillary view

In our opinion in all these cases it may be difficult to reduce the humeral head only by the anterior approach and the head could suffer ulterior traumas during this maneuver especially when the humeral head is displaced very posteriorly.

By a mini-invasive posterior approach you can have the advantage of an atraumatic reduction of the head and the possibility to retention the posterior capsule frequently damaged by the trauma (6,7).

We report our experience using two approaches: the posterior mini-invasive approach and the standard delto-pectoral one.

Methods

We treated with combined deltopectoral and mini-posterior approach 5 patients with posterior shoulder fracture-dislocation (3 male and 2 female). In all

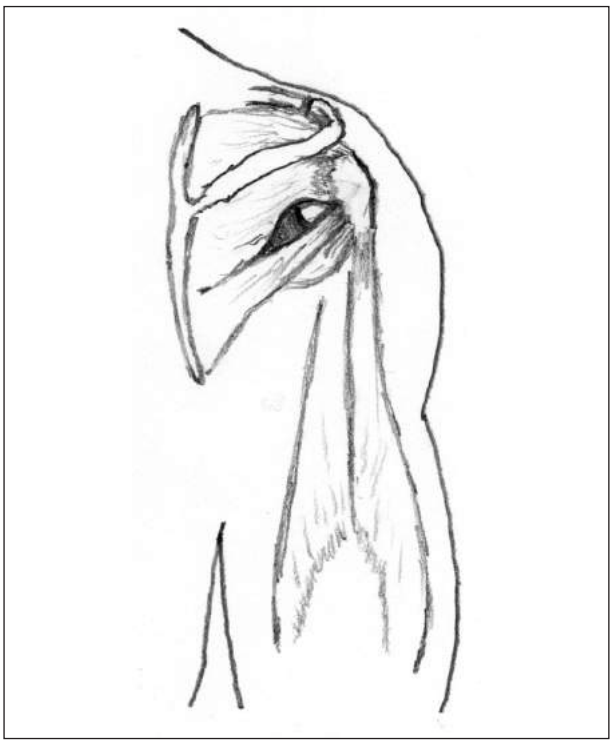

Figure 6.

cases pre-operatively we performed antero-posterior and axillary radiographs (Fig. 8-9) and three-dimensional TC reconstruction for accurate preoperative (Fig 10-11). In the post-operative we made only a radiographic evaluation at one, two and three month and at one year after surgery (Fig 12-13). The syntesis of the fracture was obtained with titanium angular stability Synthes plate type Philos. A Clinical examination was performed at one year and follow-up was at two years. Patients were evaluated by criterias resumed in table 1.

Table 1. Classification fractures and clinical evalutation after 2 years F.U.

Case	Age	Sex	Cause	Fracture	Delay before operation	Surgical approach	Pain f.u. 2y	Return to work	Internal rotation f.u. 2y	External Rotation f.u. 2y	Constant score f.u. 2y
1	38	M	SKI	Impression fractures with articular loss (neer)	2 weeks	combined	0	Yes	interscapular	Full rot	94
2	42	F	FALL	Same	no	combined	0	Yes	interscapular	Full rot	94
3	56	M	CAR	Same	no	combined	0	Yes	Waist L3	Full rot	83
4	54	M	FALL	Same	5 days	combined	0	Yes	interscapular	Full rot	90
5	45	F	MOTO	Same	no	combined	0	Yes	interscapular	Full rot	86

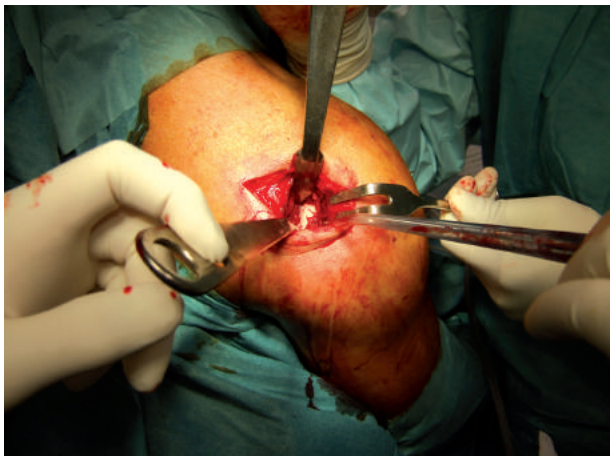

Figure 7. Example of shoulder X-Ray in antero-posterior and axillary view

Figure 8. Case 1 X-Ray pre-op

In one case the fractured little tuberosity was transposed with his tendon to fill the bone defect of the inverse Hill Sachs and it was synthetised by a transosseous suture. In two cases was made a Mclaughlin transfer. In another two patients the subscapolaris tendon was partially detached to permit an easier approach to the joint and was then repaired with corkscrew anchors (Arthrex).

Figure 9. Case 1 X-Ray pre-op

For the posterior approach, with the patient in beach-chair position, we made a straight 5 cm long incision, 1 cm under and parallel to the spine of the scapula (Fig. 3).

Through the posterior deltoid fibres we reach the deep muscolar plane and the posterior capsule is exposed by the infraspinatus and Teres Minor intermuscolar septum; often the capsule is damaged and the humeral head is already visible and it can be easily replaced in the glenoid with a gentle manual pressure. So the mattress suture and the anatomical retention of the capsule are made (Fig. 4-5-6-7). By the deltopectoral approach the fracture is synthetised.

Figure 10. Case 1 TC e TC rendering 3D.

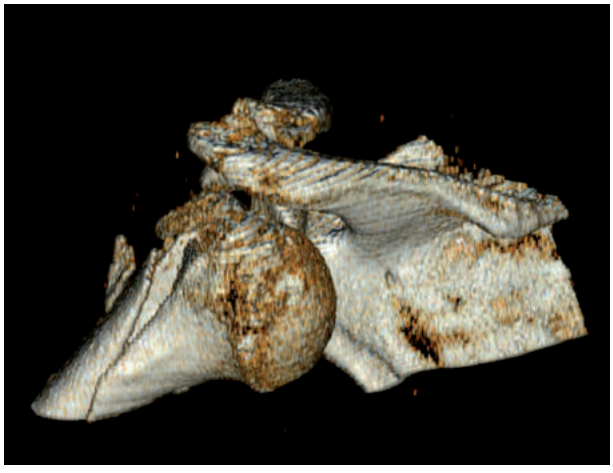

Figure 11. Case 1 TC e TC rendering 3D.

Results

Our results are resumed in table 1. At 2 years follow up all the Patients were painfree and have returned to their original occupation (Fig. 14-15-16-17) Only one patient had an important limitation of elevation, intrarotation and abduction (L3). In our opinion it was due to the painful rehabilitation.

Figure 12. Case 1X-Ray Post-op

Figure 13. Case 1 X-Ray at two years of FU

Figure 14. Case 1. Clinical evalutation

Figure 15. Case 1. Clinical evalutation

Discussion and conclusion

Posterior shoulder fracture dislocations are rare injuries.

Sometimes diagnosis is delayed and the management of these fractures is complex. The anterior deltopectoral approach is most commonly advised but some

Figure 16. Case 1. Clinical evalutation

Figure 17. Case 1. Clinical evalutation

authors recommend a combined anterior, posterior and subacromial approach (8,9-10).

In our opinion a combined minimally invasive posterior approach and anterior deltopectoral approach reduces iatrogenic lesions that can happen during head relocation by a single anterior approach (11,12).

By the posterior minimally invasive approach the humeral head can be easily relocated avoiding damages of the cancellous bone and of the articular cartilage and we know that the quantity of cancellous bone in the humeral head is very important also for holding the plate screws and consequently the stability of the synthesis. The posterior approach is also the exposure of choice for capsular plication of the traumatic elongated posterior capsule. At last it also permits to evaluate the glenoid and the posterior labrum (13,14).

This combined approach is less invasive, easier for dislocation reduction of the humeral head, with minimal biological damage that may occur during the reduction maneuvers (14-16). The synthesis of the fracture and the McLaughlin transfer are made by the anterior deltopectoral approach.

Limits of our study are a small number of patients, although we think that five cases are sufficient due to the rarity of these fracture dislocations as highlighted also in the literature, low level of evidence and absence of control group.

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Correspondence:
Enricomaria Lunini
Department of Orthopaedics and Traumatology
Santa Maria Hospital
43043 Borgo Val di Taro (PR), Italy
Tel. +39-0525-970272
E-mail: enricomaria.lunini@gmail.com