

old anterior dislocation of the shoulder joint : a rare case report and literature review

Teng Wan

The Second Affiliated Hospital, Department of Orthopaedic Surgery, Hengyang Medical College, University of South China

Yan Jiang

Xiangnan University

Haifeng Tan

The Second Affiliated Hospital, Department of Orthopaedic Surgery, Hengyang Medical College, University of South China

Weiming Guo (✉ 253779211@qq.com)

The Second Affiliated Hospital, Department of Orthopaedic Surgery, Hengyang Medical College, University of South China

Case Report

Keywords: anterior shoulder dislocation, obsolete, arthroscopic, traumatic

Posted Date: March 17th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1455876/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: anterior dislocation of shoulder is the most common dislocation of joint. With the improvement of diagnosis rate, the clinical diagnosis of old anterior dislocation of shoulder is relatively rare. This year, with the improvement of arthroscopic technology, arthroscopic treatment is the mainstream way of shoulder dislocation. However, the current treatment plan for old anterior shoulder dislocation is not clear, and arthroscopic treatment may be difficult to reduce.

Case report: this paper reports the clinical experience of arthroscopic treatment of traumatic old anterior shoulder dislocation in a 30-year-old woman. After follow-up for 6 months, regular postoperative reexamination and early rehabilitation training were conducted. There were no postoperative complications, excellent score according to Rowe and Zarin criteria, competent for daily activities, no pain, 10 °loss of anterior lift, 30 °loss of external rotation, and average loss of 1 vertebral body level of internal rotation.

Conclusion: the treatment strategy and rehabilitation of anterior dislocation of shoulder need to be further studied.

Introduction

The shoulder joint mainly includes the glenohumeral, acromioclavicular, sternoclavicular and scapulothoracic brachial joints; and shoulder dislocation mainly refers to the glenohumeral joint and is the most common joint dislocation seen by orthopaedic surgeons in emergency situations, reported to occur in 8.2 to 23.9 per 100,000 people per year [1–4]. And anterior dislocations account for 98% of all shoulder dislocations [5–6]. Shoulder dislocations are more common in younger age groups who are active in sports and daily activities [7]. The diagnosis of acute dislocation is uncomplicated in patients who have obvious symptoms associated with the dislocated joint with significant deformity and are able to be seen promptly. However, patient negligence in seeking post-traumatic care and patient failure to present promptly result in rare old undisplaced shoulder dislocations. They are often difficult to reposition by closed resetting and usually require surgical intervention to reposition and stabilise the joint. The treatment options for old anterior shoulder dislocations are unclear [8]. In the case described here, a patient with a traumatic old unresolved anterior shoulder dislocation was presented. The patient did not receive further treatment as multiple resetting after the injury had failed, however, prolonged pain, deformity and dysfunction led to admission to our hospital for further consultation. We therefore report this and review the relevant literature.

Case Reports

This is a 30-year-old female patient with no previous specific medical history. The mechanism of injury was mainly a motorbike fall with a direct landing on the right shoulder, resulting in a painful deformity and limited movement of the right shoulder. The patient was admitted to the local hospital on an

emergency basis, and conventional radiographs (front and side views) showed an anterior dislocation of the right shoulder joint and a fracture of the greater tuberosity of the humerus, and she was intermittently admitted to the local hospital for three consecutive manipulative repositioning. The right shoulder was found to have a square shoulder deformity with subacromial hollowing and slight pressure pain on the lateral aspect of the acromion. Our radiographs showed an anterior subluxation of the right humeral head and a fracture of the greater tuberosity of the humerus (Fig. 1f).

For further evaluation, three CT scans showed: anterior subluxation of the right humeral head, fracture of the greater tuberosity, and Hill-Sachs injury to the humeral head (Fig. 1g, h). MRI was completed to assess the articular glenoid labrum and rotator cuff, and MRI revealed satisfactory continuity of the supraspinatus and infraspinatus tendons and injury to the anterior inferior glenoid labrum (Fig. 1j, k). In addition, a Hill-Sachs injury to the humeral head was confirmed. A neuromyogram of the affected limb was also completed to assess the axillary nerve, which showed normal. An upper limb vascular ultrasound was completed and showed normal vascularity. In view of the rare clinical reports of old shoulder dislocation and the fact that the treatment plan was not yet unified, the whole department discussed the treatment plan before the operation and limited the surgical treatment (Table. 1). The greater tuberosity was stable and no further treatment was done; after successful repositioning of the humeral head, there was no re-dislocation of the joint without external forces, so soft tissue balancing and external fixation package was eventually adopted for fixation; postoperative X-ray/CT and MRI were regularly reviewed and the shoulder joint was satisfactorily repositioned without in dislocation and instability (Figure 1m, n, k). Post-operative rehabilitation plan: brace-assisted fixation on the second day after surgery and start of passive functional exercises, including forward flexion and external rotation; 6 weeks after removal of the brace, start of active functional exercises. The patient has now been followed up for six months, with satisfactory functional recovery, disappearance of pain and no complications. The patient was also informed of the study and consented to the publication of this article.

Discussion

Shoulder dislocations are relatively common in clinical joint dislocations. There is no unified standard consensus on the management of shoulder dislocations in all age groups: whether shoulder dislocations should be treated conservatively or surgically is still under discussion. Manual repositioning under emergency care is routinely recommended. There is no consensus on the method of repositioning, with Kocher's method recommended, foot stirrups not recommended, and brachial plexus anaesthesia or intra-articular local anaesthesia for repositioning in elderly patients with osteoporosis. There is also no agreement on the type of bracing and there is still discussion on whether to immobilise the shoulder joint in internal or external rotation [9–11]. A study has reported no difference between these two types of bracing in terms of recurrence rates and healing outcomes of joint dislocation and return to activity levels [12]. Negligent and untimely access to medical care after trauma results in rare old undisplaced shoulder dislocations that are challenging to treat, and the patients in this paper were primarily untimely for further consultation. The success rate of resetting under general anaesthesia for old shoulder dislocations is low (40%) because the risk of resetting is greatly increased the longer the joint is not resetting under

emergency care following traumatic dislocation, contracture of the joint capsule, development of surrounding scar tissue, entrapment of surrounding injured tissue and formation of fibrotic soft tissue [13].

Also related literature has found many terms and durations used to describe obsolete shoulder dislocations. While most authors define a delayed diagnosis of shoulder dislocation of more than 3 weeks as obsolete shoulder dislocation, some experts consider the cut-off point for the division between acute and obsolete cases to be 24 hours after to 1 month [14]. In addition, there are various terms used to describe this condition, including chronic, unrecognised, missed, old unreset, chronic unreduced and old dislocation [14]. Although the relevant literature expresses the same concept, these terms may cause some confusion within the specialty; and in order to understand the disease itself, they are not understood as the same concept within the relevant specialty books and in the clinic, posing difficulties for article searching and writing, and they are not the same as each other. Therefore, they need to be standardised to avoid long-term confusion. Strategies for managing this issue are also controversial and remain a challenge. The patient in this article has been unsuccessfully diagnosed and treated since the injury and has remained in dislocation. We therefore refer to this as an obsolete non-repositioning.

At present, there is no uniform protocol for treatment, based on this article in that treatment is experimental or more empirical than evidence-based. Of course, with the development of multimedia, a combination of relevant specialist books and literature is available on the various methods of treatment of old dislocations. These include conservative treatment, resetting, incisional repositioning and resection arthroplasty, as well as the development of minimally invasive techniques, arthroscopic repositioning and related repair methods. In this paper, however, the patient first attempted a manipulative resurfacing even after general anaesthesia, which ultimately failed. Although the literature suggests that attempts at resetting should be abandoned if the dislocation is more than 6 weeks old. If resetting fails, the next step is surgical repositioning [15]. Because of the extensive fibrosis in a long-dislocated shoulder joint, adequate release of the joint capsule, excision of the entrapment and scar tissue and balancing of the soft tissue tension of the joint are required to reposition the joint; otherwise, the abnormal soft tissue blocks repositioning of the joint and at the same time the soft tissue tension is not balanced and the stability of the joint cannot be maintained after repositioning. In addition, scar tissue and laxity covering the surface of the pelvis must be removed prior to repositioning. For this, we take an arthroscopic, minimally invasive release and reposition. On entering the humeral glenoid joint, the humeral head could not be seen within the joint due to the large amount of scar tissue covering the surrounding area, so the joint was cleared of scar tissue. The long head of the biceps tendon was dislocated and seized. The joint capsule was released after severing the long head tendon, but was found to be difficult to reset. The subacromial crest was then entered and explored to see the rostrascapular ligament entrapment, so the rostrascapular ligament was cleared. The glenohumeral joint was then accessed to release the anterior joint capsule and gradually reposition the humeral glenoid joint.

Depending on the humeral head bone defect, the Hill-Sachs injury was filled using the infraspinitus tendon. For stabilisation of the joint after release, most reports recommend a direct approach of internal

fixation through the shoulder joint after repositioning. Neviaser recommended screw fixation for 3-4 weeks and Wilson and Mckeever recommended steel pin fixation between the acromioclavicular humerus [16.17]. Goga reported on a group of 10 cases with incisional repositioning across the acromioclavicular humeral pin fixation for 4 weeks, with three excellent, five good and two fair results according to the Rowe and Zarin system [14]. However, consider that internal fixation additionally increases damage to the humeral head and articular glenoid and tends to lead to joint adhesions and stiffness. If early shoulder movement improves the nutrition of the articular cartilage and reduces damage to the articular surface. In our case, the Hill-Sach injury was small, the greater humeral tuberosity had partially healed and the dislocation time was relatively short. In our case, the anterior shoulder contracture was extensively released and the posterior Hill-Sach injury was repaired by filling the sub-gonadal tendon to enhance the soft tissue balance anteriorly and posteriorly, with a short period of early abduction brace fixation, which is more effective than internal fixation with a metal object. This allows intermittent passive movement within a safe range several times a day, morning, noon and night, without fear of re-dislocation and to avoid stiffness.

The most common injuries accompanying old anterior shoulder dislocations are Bankart and Hill-Sachs injuries, with Bankart injuries referring to injuries to the anterior aspect of the joint capsule and the labrum of the glenoid and Hill-Sachs injuries referring to injuries to the posterior lateral aspect of the humeral head, with a reported correlation of 90–97% and CT and MRI examinations emerging as the gold standard for their diagnosis [18.19]. The advantage of arthroscopic management is that it allows direct access and examination of these intra-articular problems within the joint. In addition, arthroscopic repair of the ligamentous structures can provide the initial stability required to prevent postoperative subluxation or re-dislocation. Thus, allowing the possibility of early post-operative rehabilitation, it has the potential benefit of better functional outcomes.

For the treatment of shoulder dislocations, the goal is to prevent further dislocation and to restore a satisfactory range of motion and strength to the limb for life. For most patients with shoulder dislocations, pain and dysfunction severely interfere with activities of daily living. Although some articles show that pain in old shoulder dislocations is very mild and range of motion is quite satisfactory, over time, dysfunction and symptoms can eventually develop, potentially to a degree that is intolerable for the patient [14]. Most importantly, the best treatment option for old shoulder dislocations is to prevent acute dislocations from developing into old ones in the first place through prompt and accurate diagnosis. It is imperative that patients at risk of underdiagnosis are given and visual attention and that a thorough whole-body examination is performed when there is a high degree of suspicion. In addition to standard simple imaging, as equipment technology improves and becomes more widely available, CT can be considered to assess the joint more accurately if necessary. In patients with a diagnosis of old shoulder dislocation, a closed manipulative repositioning can still be attempted in the first instance. Although in most cases this is difficult and unsuccessful, closed resetting is still recommended as it can still have a positive effect on improving joint function and relieving symptoms. When this fails, surgical repositioning is recommended. However, when choosing a surgical approach, the presence of comorbidities, the patient's pre-injury functional needs and their expectations must also be taken into account, along with

their own skills and experience, such as arthroscopic release of the joint and repair of the glenoid labrum. In some patients, excessive and unnecessary treatment, whether by arthroscopic or open techniques, may cause more harm than good. In some patients of advanced age, a very small number of patients with old shoulder dislocations remain asymptomatic and reasonably functional [20], and this article should remind us that in a very small number of patients, no treatment may be the best treatment.

In conclusion, arthroscopic release and repair is an alternative option for the treatment of old anterior shoulder dislocations. The anterior and inferior joint capsule is the main factor blocking repositioning; the capsule can develop secondary contractures that further block repositioning; and soft tissue balancing can achieve joint stabilisation.

Declarations

Acknowledgements

Not applicable.

Authors' contributions

TW wrote the first draft of the letter, and coordinated and integrated comments. YJ, HT and WG critically revised and edited successive drafts of the manuscript. All authors read and approved the final manuscript

Funding

Not applicable.

Availability of data and materials

Not applicable.

Ethics approval and consent to participate

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Consent for publication

Written informed consent for publication was obtained from all participants.

Competing interests

The authors declare that they have no competing interests

References

1. Kazár B, Relovszky E. Prognosis of primary dislocation of the shoulder. *Acta Orthop Scand.* 1969; 40(2):216–224.
2. Nordqvist A, Petersson CJ. Incidence and causes of shoulder girdle injuries in an urban population. *J Shoulder Elbow Surg.* 1995;4(2):107–112.
3. Owens BD, Duffey ML, Nelson BJ, et al. The incidence and characteristics of shoulder instability at the United States Military Academy. *Am J Sports Med.* 2007;35(7):1168–1173.
4. Simonet WT, Melton LJ, Cofield RH, Ilstrup DM. Incidence of anterior shoulder dislocation in Olmsted County, Minnesota. *Clin Orthop Relat Res.* 1984;(186):186–191.
5. Bishop JY, Flatow EL. Pediatric shoulder trauma. *Clin Orthop Relat Res.* 2005;(432):41–48.
6. Cutts S, Prempeh M, Drew S. Anterior shoulder dislocation. *Ann R Coll Surg Engl.* 2009;91(1):2–7.
7. Maier M, Geiger EV, Ilius C, et al. Midterm results after operatively stabilised shoulder dislocations in elderly patients. *Int Orthop.* 2009;33(3):719–723.
8. Jerosch J, Riemer R, Schoppe R. Asymptomatic chronic anterior posttraumatic dislocation in a young male patient. *J Shoulder Elbow Surg.* 1999; 8(5):492–494.
9. Minkus M, Königshausen M, Maier D, et al. Immobilization in External Rotation and Abduction Versus Arthroscopic Stabilization After First-Time Anterior Shoulder Dislocation: A Multicenter Randomized Controlled Trial. *Am J Sports Med.* 2021;49(4):857–865.
10. Boffano M, Mortera S, Piana R. Management of the first episode of traumatic shoulder dislocation. *EFORT Open Rev.* 2017;2(2):35–40.
11. Polyzois I, Dattani R, Gupta R, et al. Traumatic First Time Shoulder Dislocation: Surgery vs Non-Operative Treatment. *Arch Bone Jt Surg.* 2016;4(2):104–108.
12. Handoll HH, Hanchard NC, Goodchild L, Feary J. Conservative management following closed reduction of traumatic anterior dislocation of the shoulder. *Cochrane Database Syst Rev.* 2006; (1):Cd004962.
13. Rouhani A, Navali A. Treatment of chronic anterior shoulder dislocation by open reduction and simultaneous Bankart lesion repair. *Sports Med Arthrosc Rehabil Ther Technol.* 2010; 2:15.
14. Goga IE. Chronic shoulder dislocations. *J Shoulder Elbow Surg.* 2003;12(5):446–450.
15. Jerosch J, Riemer R, Schoppe R. Asymptomatic chronic anterior posttraumatic dislocation in a young male patient. *J Shoulder Elbow Surg.* 1999;8(5):492–494.
16. Neviasser JS. THE TREATMENT OF OLD UNREDUCED DISLOCATIONS OF THE SHOULDER. *Surg Clin North Am.* 1963;43:1671–1678.
17. Wilson JC, Mc KF. Traumatic posterior dislocation of the humerus. *J Bone Joint Surg Am.* 1949;31a(1):160–172.
18. Pancione L, Gatti G, Mecozzi B. Diagnosis of Hill-Sachs lesion of the shoulder. Comparison between ultrasonography and arthro-CT. *Acta Radiol.* 1997;38(4 Pt 1):523–526.

19. Kirkley A, Litchfield R, Thain L, Spouge A. Agreement between magnetic resonance imaging and arthroscopic evaluation of the shoulder joint in primary anterior dislocation of the shoulder. Clin J Sport Med.2003;13(3):148–151.
20. Chung H, Yoon YS, Shin JS, et al.Chronic Irreducible Anterior Dislocation of the Shoulder without Significant Functional Deficit. Clin Orthop Surg.2016;8(3):333–338

Table

Table 1: Pre-operative discussion options

Period of surgery	<ul style="list-style-type: none"> a. limited-term surgery? b. elective surgery
Surgical approach	<ul style="list-style-type: none"> 1. Minimally invasive treatment attempted first? 2. Minimally invasive failure and incisional repositioning?
How to loosen and reset	<ul style="list-style-type: none"> a. Why did all 3 resetting attempts fail? b. What are the factors that prevent reset? c. Release sequence: intra-articular? Subacromial space? Other?
How Hill-Sachs injuries are treated.	<ul style="list-style-type: none"> a. Sub-ganglionic tendon filling? b. Bone grafting?
Are large nodules fixed.	<ul style="list-style-type: none"> a. Reset and fixation? b. Conservative treatment?
How to stabilise the joint after release.	<ul style="list-style-type: none"> 1. Anchor nailing for joint capsule repair? 2. Clinically fixed? 3. Soft tissue balance?

Figures



Figure 1

Pre-operative physical examination, imaging and post-operative imaging re-examination of patients. a, b, c, d represent physical examination of shoulder mobility in all directions; e and f represent preoperative radiographs suggestive of shoulder dislocation combined with humeral tuberosity fracture; g and h represent CT of the shoulder suggestive of Hill-Sachs injury and humeral tuberosity fracture; i, j represent

preoperative MRI suggestive of intact rotator cuff continuity. k, l and m represent postoperative review suggestive of joint repositioning, satisfactory rotator cuff position and satisfactory continuity.