

Case Report

Bilateral Posterior Fracture Dislocations of the Shoulder Treated with Bilateral Reverse Total Shoulder Arthroplasty

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Abstract

We report a case of a 72-year-old gentleman who suffered bilateral posterior fracture dislocations of the shoulder after a first-time, isolated tonic-clonic seizure. He was diagnosed with four-part, posterior fracture dislocations after plain radiographs and computed tomography. Due to the fracture configuration bilaterally, he was managed with bilateral reverse Total Shoulder Arthroplasty. To our knowledge, this is the only reported case of bilateral posterior fracture dislocation of the shoulder managed with bilateral reverse Total Shoulder Arthroplasty. At twenty months follow up he is back to all previous activities and has no complaints.

Introduction

We report a case of a seventy-two-year-old, right hand dominant gentleman who presented to our institution with bilateral posterior fracture dislocations of the shoulder secondary to a tonic-clonic seizure. He underwent bilateral reverse geometry Total Shoulder Arthroplasty (rTSA).

Case Report

The patient presented via ambulance with a first time tonic-clonic seizure lasting forty minutes. This was associated with bilateral posterior fracture dislocations of the shoulder. He had no significant past medical or surgical history. He was a keen golfer, playing three times per week. He is an ex-smoker and was independently mobile prior to this admission. Clinical examination was initially limited due to post-ictal confusion. Range of motion was reduced secondary to pain. Examination of the wrist and elbow bilaterally were unremarkable and there was no neurovascular deficit seen with either upper limb. Initial radiological assessment consisted of plain films and computed tomography of both shoulders. These confirmed bilateral four-part posterior fracture dislocations of the shoulder. The patient underwent closed reduction of both shoulders on the next operating list.

Definitive surgical management was delayed as the patient was being investigated for a cause of his seizure. After consultation with the neurology service he was commenced on Levetiracetam

for seizure control.

At three weeks post presentation the patient underwent reverse Total Shoulder Arthroplasty using the Univers Revers™ (Arthrex, Florida, USA) reverse Total Shoulder Arthroplasty system. This was performed using a standard deltopectoral approach. The long head of biceps was tenodesed to the pectoralis tendon. Suture control of subscapularis (lesser tuberosity fragment) and supraspinatus w (greater tuberosity fragment) was achieved prior to humeral head removal. The glenoid was prepared in standard fashion followed by insertion of the base plate and glenosphere. The humeral shaft was prepared with sequential reamers and insertion of the stem and poly insert after satisfactory trialling of these implants. The tuberosity fragments were reattached via holes on the humeral body after reduction of the shoulder. Closure occurred in layers and the patient was placed in a shoulder immobiliser post operatively.

He immediately began rehabilitation as per our departmental rTSA protocol. This consists of a sling for four weeks and gentle active assisted range of motion exercises with protected external rotation. Scapulothoracic control exercises as well as active hand, wrist and elbow ranges of motion exercises are also prescribed for the first three weeks. After three weeks, active assisted range of motion exercises were progressed and assisted stretches in all directions were commenced. After six weeks these exercises were again progressed including proprioceptive exercises. At six weeks follow up, after remaining seizure free and progressing well with his recovery, he was immediately listed for the same procedure on

the contralateral shoulder.

The patient is now twenty months post right rTSA and eighteen months' post left rTSA. He is very pleased with the outcome and has been back playing golf six months following his initial surgery. Clinical examination demonstrated excellent range of motion. Abduction was 120° on the right side, 110° on the left side. Forward flexion was 130° bilaterally and internal rotation was to the lower thoracic spine bilaterally. One might expect better ranges of motion with a rTSA however this patient underwent Coronary Artery Bypass Grafting eleven months after the second rTSA which hampered his recovery somewhat. Oxford Shoulder Score for his right shoulder totals 43 and the left shoulder is 35 indicating excellent function with little pain. He has now been discharged from the clinic, to follow up as required (Figure 1-4).

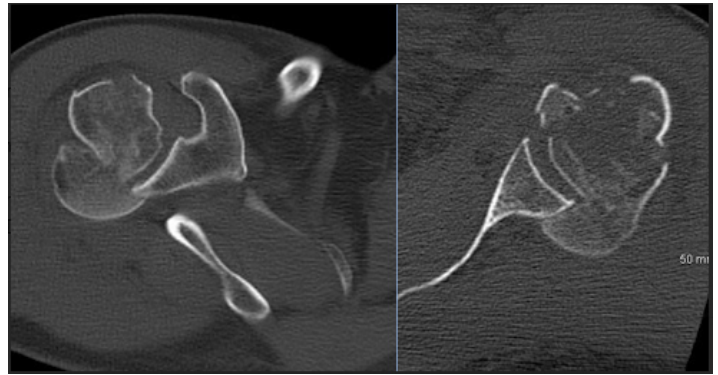


Figure 3: Axial CT slices of the right and left Shoulders at the level of the Humeral head.



Figure 1: Pre-operative AP and Scapular Y radiographs of the right Shoulder.



Figure 2: Pre-operative AP and Scapular Y radiographs of the left Shoulder.

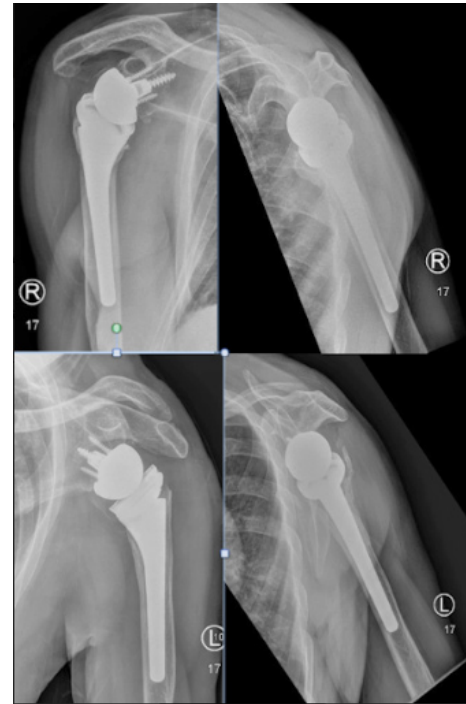


Figure 4: Post-operative AP and Scapular Y radiographs of the right (above) and left shoulders.

Discussion

The rationale behind our management plan was as follows - firstly the fracture configuration dictated against open reduction and internal fixation due to the relatively high risk of avascular necrosis of the humeral head. Secondly, the success of rTSA due to trauma in the elderly is well documented in the literature and provides a more predictable and rapid return to activities of

daily living when compared with shoulder hemi-arthroplasty [1]. Bilateral posterior fracture dislocations of the shoulder are rare injuries, representing less than 0.9% of 1500 cases assessed by Neer [2, 3]. There are a variety of different aetiologies however seizures were the most commonly reported cause of this pattern of injury. Seizures have been reported as being due to stroke, brain tumours or can be associated with hypoglycaemia [4-8]. Other less common presentations include electric shock and extreme trauma [9]. Therefore, precise history taking and clinical examination are paramount in raising this suspicion. This in conjunction with at least one anteroposterior film and at least one axillary film is essential to the work up of any shoulder complaint [10].

There are several signs described on the anteroposterior film suggestive of posterior dislocation, which include; internal rotation of the humerus due to the fixed position of the humeral head on the posterior glenoid rim, the vacant glenoid sign, the 'light-bulb' appearance of the humeral head and the 'rim sign' in which there is greater than 6 mm between the anterior glenoid rim and the humeral head. Delayed diagnosis has been reported extensively in the literature with time to diagnosis ranging from immediate to a few days' post injury, even up to twenty-five years [4-7, 11, 12]. Fractures in the setting of posterior shoulder dislocation can often be subtle but must not be missed [13]. In 2012 a systematic review by Rouleau et al. found that 34% of posterior dislocations had an associated fracture, while 65% had associated injuries [14].

Associated injuries included anteromedial impaction fractures (Reverse Hill-Sachs Lesions) which were described in 65 cases, proximal humerus fractures including 3 part, 4 part, anatomical and surgical neck fractures were listed in 32 cases. It is the authors' opinion that all patients that sustain a fracture dislocations of the shoulder secondary to a seizure should undergo computed tomography of the affected joint to avoid delayed or misdiagnosis and therefore the instigation of inappropriate treatment [5, 15-17]. Like with most uncommon presentations, treatment should be tailored to the type of lesion, the interval of time between trauma and treatment and also taking into account the patients age, co morbid disease and desired levels of activity. It is well documented that in older patients (> 65 years old) with complex fracture patterns, there is a high risk of avascular necrosis. The experience of our department in this setting would tend towards rTSA if open reduction and internal fixation were not feasible. There is enough evidence available to determine that rTSA outperforms shoulder hemi-arthroplasty, certainly in the elderly population and this is now the treatment of choice in our institution where reconstruction is not possible [18].

Conclusion

Although bilateral posterior fracture dislocations of the shoulder are a rare injury, functional limitations to the individual can

be catastrophic. A systematic approach to clinical and radiological investigation of the injured shoulder is of the utmost importance. Prompt diagnosis and appropriate surgical management by an experienced shoulder surgeon can provide excellent functional outcomes.

References

1. Garrigues GE, Johnston PS, Pepe MD, Tucker BS, Ramsey ML, et al. (2012) Hemiarthroplasty versus reverse total shoulder arthroplasty for acute proximal humerus fractures in elderly patients. *Orthopedics* 35: e703-e708.
2. Neer CS 2nd (1970) Displaced proximal humeral fractures. I. Classification and evaluation. *The Journal of bone and joint surgery American volume* 52: 1077-1089.
3. Neer CS 2nd (1970) Displaced proximal humeral fractures. II. Treatment of three-part and four-part displacement. *The Journal of bone and joint surgery American volume* 52: 1090-1103.
4. Agarwal M, Khan WS, Trehan R, Syed AA, Giannoudis PV (2008) Bilateral Posterior Fracture-Dislocation of the Shoulder Presenting as a Dissecting Aneurysm of the Thoracic Aorta: An Uncommon Presentation of a Rare Injury. *Journal of Emergency Medicine* 35: 265-268.
5. Amir MA, Alenazi B, Wyse RK, Tamimi W, Kujan O, et al. (2015) Neglected Bilateral Posterior Shoulder Fracture Dislocation in an Uncontrolled Seizure patient. *Pakistan journal of medical sciences* 31: 1018-1020.
6. Begin M, Gagey O, Soubeyrand M (2012) Acute bilateral posterior dislocation of the shoulder: one-stage reconstruction of both humeral heads with cancellous autograft and cartilage preservation. *Chirurgie de la main* 31: 34-37.
7. Betz ME, Traub SJ (2007) Bilateral posterior shoulder dislocations following seizure. *Internal and emergency medicine* 2: 63-65.
8. Patrizio L, Sabetta E (2011) Acute posterior shoulder dislocation with reverse hill-sachs lesion of the epiphyseal humeral head. *ISRN surgery* 2011: 851051.
9. Brackstone M, Patterson SD, Kertesz A (2001) Triple "E" syndrome: Bilateral locked posterior fracture dislocation of the shoulders. *Neurology* 56: 1403-1404.
10. Clough TM, Bale RS (2001) Bilateral posterior shoulder dislocation: the importance of the axillary radiographic view. *European journal of emergency medicine: official journal of the European Society for Emergency Medicine* 8: 161-163.
11. Assom M, Castoldi F, Rossi R, Blonna D, Rossi P (2006) Humeral head impression fracture in acute posterior shoulder dislocation: new surgical technique. *Knee surgery, sports traumatology, arthroscopy : official journal of the ESSKA* 14: 668-672.
12. Bahu NJ, Adams CP (2001) An unexpected posterior shoulder dislocation. *The Journal of emergency medicine* 21: 435-436.
13. Arndt JH, Sears AD (1965) POSTERIOR DISLOCATION OF THE SHOULDER. *The American journal of roentgenology, radium therapy, and nuclear medicine* 94: 639-645.
14. Rouleau DM, Hebert-Davies J (2012) Incidence of associated injury in posterior shoulder dislocation: systematic review of the literature. *Journal of orthopaedic trauma* 26: 246-251.

15. Baring TK, Ahrens PM (2012) Iatrogenic glenoid rim fracture during manipulation of a posterior dislocation. *International journal of shoulder surgery* 6: 99-100.
16. Brunot-Millot S, Duchene C, Julien Y, Tavernier C, Moreau T, et al. (2013) Supra-scapular nerve impairment in missed posterior dislocation after electrocution. *Clinical neurology and neurosurgery* 115: 1864-1866.
17. Gosens T, Poels PJ, Rondhuis JJ (2000) Posterior dislocation fractures of the shoulder in seizure disorders--two case reports and a review of literature. *Seizure* 9: 446-448.
18. Neyton L WG (2008) Locked posterior dislocation or fracture dislocation: Anatomical or reverse prosthesis? In: *Medical S*, editor. Nice Shoulder Course; Nice, France. 227- 35.