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CASE REPORT

Irreducible acute anterior shoulder dislocation due to rotator cuff tear and associated fracture of the greater tuberosity: A method of open reduction and rotator cuff repair

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Introduction

Failure of closed manipulative reduction of an acute anterior shoulder dislocation is rare and is usually due to a structural block within the joint. We report a case of an anterior shoulder dislocation with associated massive rotator cuff tear and fracture of the greater tuberosity. This dislocation was irreducible using standard closed methods.

Case report

A 67-year-old man sustained an anterior dislocation of his right shoulder following a fall down the stairs. He attended the Casualty Department 4 days after his injury. On examination he had no neurovascular injury. Radiographs confirmed anteroinferior dislocation of the shoulder with a comminuted fracture of the greater tuberosity (Fig. 1).

Two attempts at closed reduction, under sedation, failed in the emergency room using Kocher's man-

oeuvre.⁶ A further closed manipulative reduction under general anaesthesia was also unsuccessful.

Operation

The shoulder was explored through a muscle splitting incision between the anterior and medial muscle bellies of the deltoid using the McKenzie approach.⁹ This approach was selected in preference to a standard deltopectoral approach in order to allow easy access and repair of the greater tuberosity fracture, after reduction.

On exposing the humeral head a complete avulsion of the supraspinatus tendon without any significant bony attachment was found as well as an avulsion of the infraspinatus tendon in continuity with displaced greater tuberosity fragments. The posterior periosteal sleeve was intact (Fig. 2). The dislocation was found to be irreducible using closed techniques, because the anterior glenoid rim had deeply wedged into a triangular defect in the posterior humeral head (Hill–Sachs lesion,⁴). Furthermore, the intact posterior periosteal sleeve made it difficult to disengage the fragments with simple traction and manipulation. The dislocation was reduced by longitudinal traction of

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Figure 1 A-P radiograph of the right shoulder showing fracture dislocation.

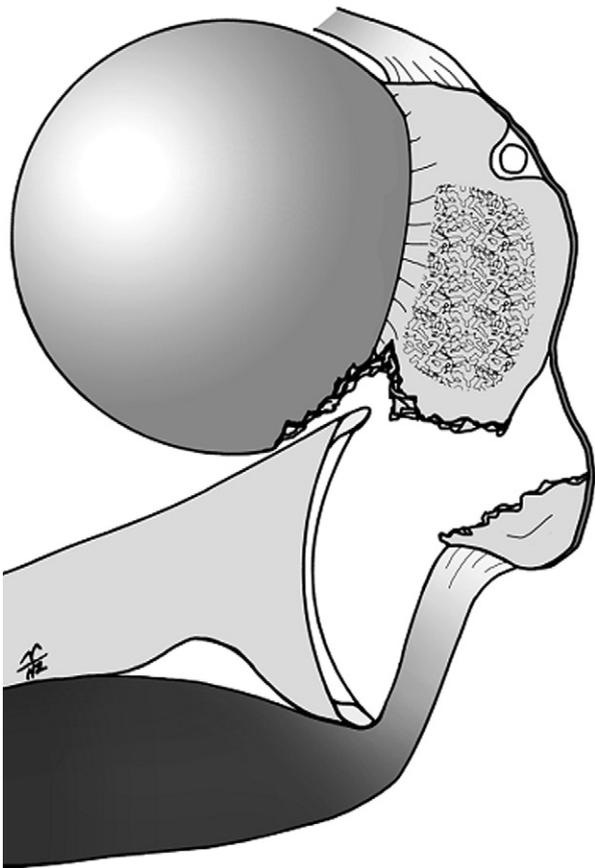


Figure 2 Schematic representation of the injury. The shaded area represents the foot print of the avulsed supraspinatus. Note a deep triangular defect in the posterior humeral head and the intact posterior periosteal sleeve.

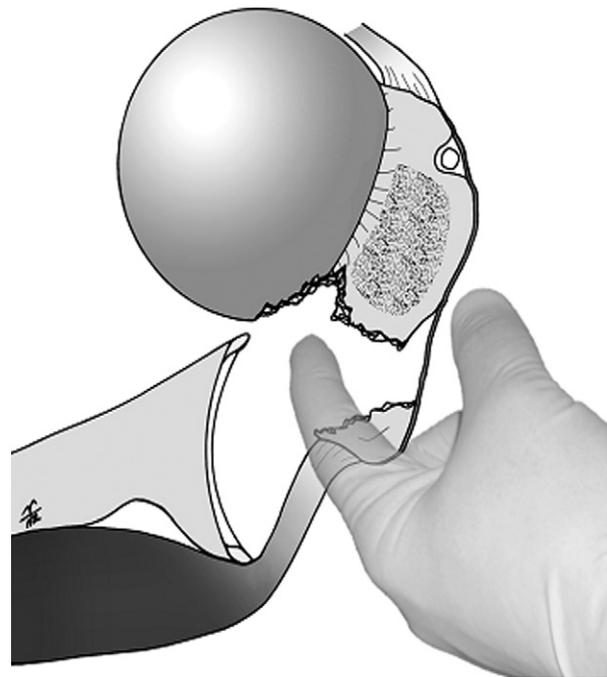


Figure 3 The dislocation was reduced by combination of longitudinal traction to the arm and the fragments were disengaged using digital pressure in an anterior direction.

the arm and the main fragments were disengaged using digital pressure in an anterior direction (Fig. 3).

Once the dislocation was reduced the fractured tuberosity and the rotator cuff avulsion was repaired using a double row repair technique (Fig. 4). The proximal repair was achieved using four anchors at the articular margin. A mix of anchors was used due to limited availability of each type of anchor. For supraspinatus repair (Fig. 5) two metallic anchors were used (Mitek Super Anchor and Mitek Fastin RC, Westwood, MA, USA) and for infraspinatus two biodegradable anchors (Arthrex 5 mm Bio-Corkscrew, Naples, FL, USA). The second row repair was achieved by applying multiple oblique mattress sutures to the rotator cuff using No. 2 Ethibond (Ethicon, Edinburg, UK) and tying it distally to a low profile 6.5 mm cancellous screw (Arthrex, Naples, FL, USA) in the surgical neck of the humerus (Fig. 6).

Postoperatively the affected arm was kept in an abduction brace for 6 weeks. During this period passive stretching and pendulum exercises was encouraged, but active movements were avoided. After the sixth postoperative week the abduction brace was discarded and active mobilisation and strengthening was started.

Constant ² scores, at 2 and 5 months postoperatively, were 60 and 80, respectively. Ultrasound scan

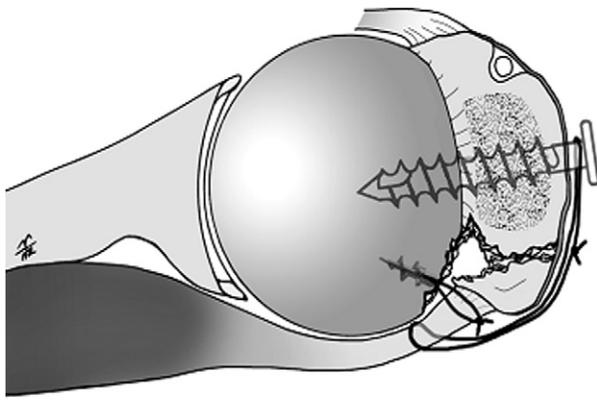


Figure 4 Schematic representation of the infraspinatus avulsion fracture fixation using a double row repair technique. The anchors were placed obliquely at the articular margin and sutures were passed vertically through the tendon/bone junction. The second row repair was achieved by applying multiple oblique Ethibond No. 2 mattress sutures to the rotator cuff (Ethicon, Edinburgh, UK) and tying it distally to a low profile 6.5 mm cancellous screw (Arthrex, Naples, FL, USA) in the surgical neck of the humerus.

of the rotator cuff 4 months after the operation showed the repair to be intact (Fig. 7). At the latest follow-up (9 months), the patient did not report any pain or functional disability from his affected

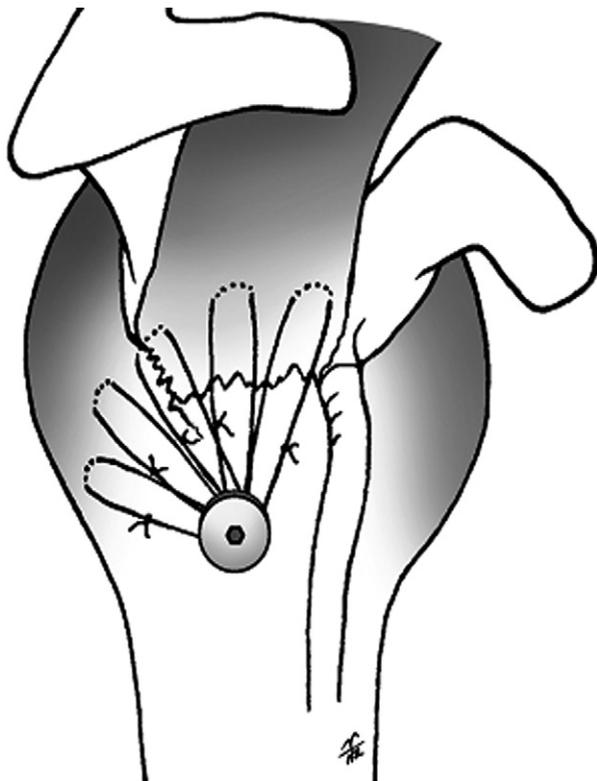


Figure 5 Schematic representation of the supraspinatus repair using a double row repair technique.

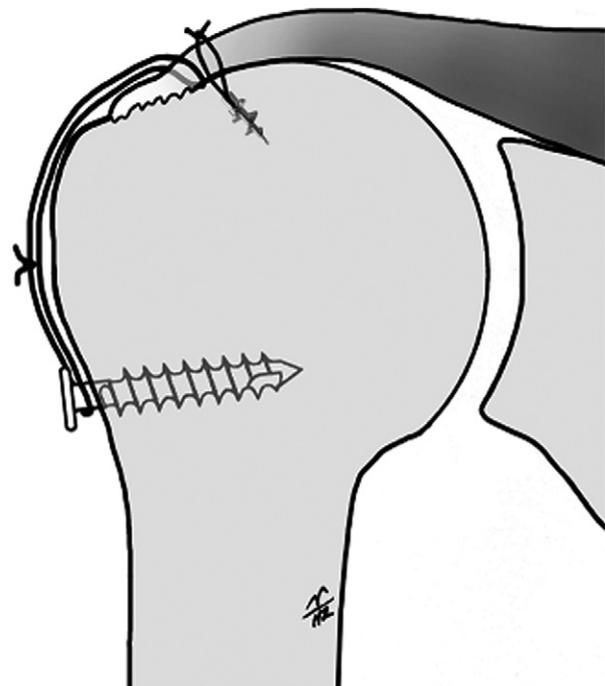


Figure 6 Lateral view of the repair showing the placement of the sutures in the second row of the double row repair.

shoulder and was satisfied with the outcome of the procedure.

Discussion

Closed reduction of an acutely dislocated shoulder is usually successful.^{1,3} The reported causes of irreducible dislocation include bowstringing of the subscapularis or bicipital tendon^{5,8}; impaction of the greater tuberosity into a Hill–Sachs lesion⁴; interposition of a ruptured subscapularis in the glenoid rim.^{1,7}



Figure 7 Ultrasound scan of the rotator cuff showed the repair to be intact.

In this case, impaction of the anterior glenoid rim into a large defect in the posterior humeral head and an intact posterior periosteal sleeve made it difficult to disengage the fragments with simple traction and manipulation. Although the intact periosteal attachment and upward pull of the supraspinatus on the greater tuberosity usually preclude interference with manipulative reduction, an associated rotator cuff tear seems to have inhibited an easy closed reduction in our case.¹⁰ A combination of greater tuberosity fracture and supraspinatus avulsion as a cause of irreducibility has not to our knowledge been previously reported.

Operative treatment through a deltopectoral approach is the accepted method of open reduction.^{1,3,10} In this instance, access to the greater tuberosity fracture and subsequent cuff repair would have been very difficult through the standard anterior deltopectoral approach. We found no difficulty in achieving reduction using the deltoid splitting incision in this case. In addition this also allowed easy exposure and repair of the fractured greater tuberosity and rotator cuff tear.⁹

References

1. Bridle SH, Ferris BD. Irreducible acute anterior dislocation of the shoulder: interposed scapularis. *J Bone Joint Surg [Br]* 1990;72(6):1078–9.
2. Constant CR, Murley AH. A clinical method of functional assessment of the shoulder. *Clin Orthop* 1987;214(January):160–4.
3. Davies MB, Rajasekhar C, Bhamra MS. Irreducible anterior shoulder dislocation: the greater tuberosity Hill–Sachs lesion. *Injury* 2000;31(6):470–1.
4. Hill HA, Sachs MD. The grooved defect of the humeral head. A frequently unrecognised complication of dislocation of the shoulder joint. *Radiology* 1940;35:690.
5. Inao S, Hirayama T, Takemitsu Y. Irreducible acute anterior dislocation of the shoulder: interposed biceps tendon. *J Bone Joint Surg [Br]* 1990;72(6):1079–80.
6. Kocher T. Eine neue Reduktionsmethode für Schulterverrenkung. *Berlina Klin Wehnschr* 1870;7:101–5.
7. Kuhnen W, Groves RJ. Irreducible acute anterior dislocation of the shoulder. *Clin Orthop Relat Res* 1979;139:167–8.
8. Lam SJ. Irreducible anterior dislocation of the shoulder. *J Bone Joint Surg [Br]* 1966;48(1):132–3.
9. McKenzie DB. The anterosuperior exposure of a total shoulder replacement. *Orthop Traumatol V* 1993;1:71–7.
10. Oni OO. Irreducible acute anterior dislocation of the shoulder due to a loose fragment from an associated fracture of the greater tuberosity. *Injury* 1983;15(2):138.