■ CASE REPORT

One-stage operation for locked bilateral posterior dislocation of the shoulder

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A man of 52 years of age had a *grand mal* seizure. He presented to our unit three months later with irreducible bilateral posterior dislocation of the shoulder. CT scans revealed large compression defects on the anteromedial aspect of the heads of both humeri. The defect on the right side was of more than 50% of the articular surface, and on the left side of 40%. He was treated by a one-stage operation with a hemiarthroplasty on one side and reconstruction of the head by an osteochondral autograft on the other. Three years later the clinical and radiological results were excellent.

Less than 3% of dislocations of the shoulder are posterior and most are missed on initial examination.¹⁻⁴ Bilateral posterior dislocation is even more rare, and of 30 patients attending our unit with posterior dislocation in only two was it bilateral. We present a patient with irreducible bilateral posterior dislocations treated by a one-stage operation involving hemiarthroplasty on the dominant side, and reconstruction of the humeral head by an osteochondral autograft on the other.

Case report

A 52-year-old man had a *grand mal* seizure while driving his car. He received immediate medical attention in a small hospital in another country and antiepileptic therapy was initiated. After three months he presented to our unit.

He had moderate pain in both shoulders, which were adducted and internally rotated (Fig. 1). Active and passive movements were limited and painful (Table I). There was no vascular or neurological abnormality in the upper limbs.

Standard radiographs revealed bilateral posterior dislocation with a large anteromedial impression in the right humeral head (Fig. 2). CT was used to assess the degree of involvement of the head, which was determined to be more than 50% of the articular surface on the right side (Fig. 3) and 40% on the left. Following Cicak's⁵ classification of defects of the humeral head, we decided to perform a hemiarthroplasty on the right and to use the excised segment for osteochondral autograft reconstruction on the left.

Through a standard deltopectoral approach the right shoulder was explored and, with difficulty, the dislocation was reduced. Inspection showed the impacted anteromedial defect of the humeral head to be greater than 50%.

An osteotomy of the remaining humeral head was done and a hemiarthroplasty cemented in 20° of retroversion. The left shoulder was approached in similar fashion. After reduction, the impacted anteromedial defect of around 40% was confirmed. The articular

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Fig. 1

Photograph showing classic posture of the patient with locked bilateral posterior dislocation. The arms are internally rotated, and the patient cannot achieve the neutral position because the humeral heads are fixed on the posterior glenoid rim.

Table I. Pre- and post-operative ranges of movement

	Right shoulder (hemiarthroplasty)		Left shoulder (autograft)	
	Pre-operative	Post-operative	Pre-operative	Post-operative
Flexion (°)	90	140	100	160
Abduction (°)	30	90	35	110
Internal rotation (°)	Sacrum	L5	Sacrum	L2
External rotation (°)	-20	45	-20	65

segment from the right shoulder was shaped into a well-fitting osteochondral autograft to reconstruct the defect (Fig. 4). Stable compression fixation was obtained using two 4.5 mm cancellous screws.

When followed up at three years, the left shoulder was generally painless with a range of movement of 160° of flexion, 65° of external rotation, internal rotation to L2, and 110° of abduction. In the right shoulder he had occasional pain, especially after physical work. This side had approximately 140° of flexion, 45° of external rotation, internal rotation to L5 and 90° of abduction (Fig. 5). The post-operative Constant score⁶ was 86 for the left and 55 for the right shoulder.

The post-operative MRI and radiographs of the left shoulder showed good incorporation of the autograft with no evidence of osteonecrosis or osteoarthritis (Figs 6 and 7). Radiographs of the right shoulder showed a good position of the hemiarthroplasty and no sign of loosening. He remains very satisfied with his treatment and level of function.

Discussion

The rarity, mechanism and high rate of misdiagnosis of bilateral posterior dislocation of the shoulder are well documented.⁷⁻¹² Important clinical features include fixed internal rotation, highlighted by an inability to externally rotate

Fig. 2

Anteroposterior and axial radiographs of the right shoulder showing posterior dislocation.

Fig. 3

Intra-operative view of the right shoulder demonstrating a large anteromedial defect greater than 50% of the articular surface.

Fig. 4

Intra-operative view of the left shoulder showing a well-fitted osteochondral graft secured by two cancellous screws.

Fig. 5a **Fig. 5b**

Photograph showing range of movement three years after operation.

Fig. 6a

Fig. 6b

Radiographs of the left shoulder three years after operation.

Fig. 7a

Fig. 7b

MR a) axial and b) coronal oblique SE, T1, WI and FST, T2, WI images of the left shoulder show normal signal intensity throughout the humeral head as a sign of good vitality. There is a small area of reactive subchondral sclerosis in the medial aspect of the humeral head. The artefact is caused by the screws.

the upper limbs when holding them with the shoulder flexed to 90° and the elbow extended.¹³ A posterior prominence is usually palpable, the anterior shoulder is flattened and the coracoid process more prominent.

The diagnosis is usually confirmed by standard plain radiographs, the most important being the axillary view, which may be difficult to obtain because of pain and stiffness. In such cases a modified axillary lateral or lateral scapular view should be taken.^{14,15} CT scans are essential to evaluate damage to the humeral head and associated fractures, of the tuberosity, surgical neck and glenoid.¹⁶

The management of locked bilateral posterior dislocation is multifactorial and must be individually based and fully discussed with the patient. The main considerations are the size of the defect in the head, the duration of the dislocation, and the age and activity of the patient. A practical guide to treatment is based on the percentage size of the humeral impression fracture.⁵ Up to 25% damage to the articular surface can be treated by closed or open reduction augmented by subscapularis transfer if there is residual instability.^{4,17} For a defect between 25% and 50% of the articular surface, transfer of the lesser tuberosity, as

described by Hawkins et al,² can be undertaken. Alternatives include autograft and allograft reconstruction.^{18,19} Osteochondral grafts can be fixed with screws or bioabsorbable pins. We prefer metallic screws which allow better fixation with earlier and more vigorous rehabilitation. Defects greater than 50% of the articular surface should be treated with a surface replacement arthroplasty or a hemiarthroplasty.²⁰⁻²² Although the former offers advantages, we did not have access to such implants.

The only literature which we could find on the subject was by Connor et al,¹⁸ who recommended hemiarthroplasty on one side and acute osteochondral autografting on the other. We too were reluctant to perform bilateral hemiarthroplasties because of the risk of inadequate function. The method which we have described is appropriate for bilateral dislocation, even when the articular defect is greater than 50% on both sides. The anatomical reconstruction should be performed on the dominant arm, allowing better function of that limb. If this fails, surface replacement or hemiarthroplasty are available. In the case of our relatively young and active patient the excellent results justify our decision.

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