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## CASE REPORT

# Bilateral anterior dislocation of the shoulder—A case report and review of the literature

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## Introduction

Bilateral anterior shoulder dislocation is a rare orthopaedic entity, even though the most common site of dislocation is the shoulder joint.<sup>1,7,12,21,19</sup> The reported causes of injury resulting in bilateral anterior dislocation or fracture dislocation of the shoulders are epileptic seizures,<sup>1,7,11,12,16,18,22</sup> fall,<sup>1,6,8,20</sup> nocturnal hypoglycemia,<sup>4,9,14</sup> electrocution,<sup>2,17</sup> weight lifting.<sup>5,10</sup> Forward traction has been reported to cause bilateral anterior dislocation of the shoulders.<sup>13,18,21</sup> To the best of our knowledge the present case is the first traumatic bilateral anterior dislocation of the shoulders caused by backward traction of the upper limbs.

## Case report

A 45-year-old farmer presented to the Accident and Emergency department with the complaints of pain and deformities of bilateral shoulders. A detailed history was elicited. The patient was leading a buffalo with the help of rope, tied around the neck of the animal (Fig. 1). He was pulling the buffalo with his both hands crossed behind his back. The animal suddenly ran backwards away from him, thus giving a sudden upward and backward pull to both the upper limbs. This sudden pull led to hyperextension of his both arms. Since then, he was having pain and restriction of movements in both the shoulders. There was no history of seizures and any

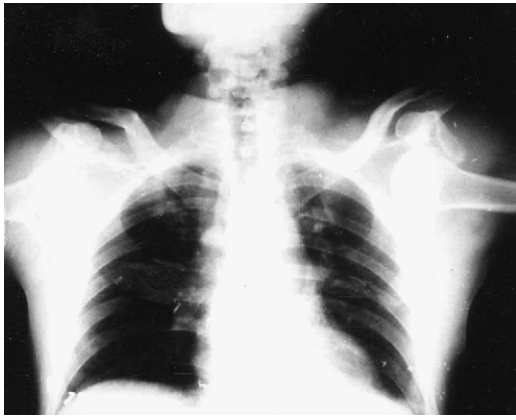
injury over the shoulders in the past. On clinical examination, the both arms were slightly abducted and internally rotated and any motion of arms caused pain. The shoulder contours appeared flattened. There was anterior fullness and the humeral heads could be palpated. There was no neurovascular deficit. A clinical diagnosis of bilateral anterior dislocation of shoulders was made and which was confirmed roentgeno-graphically (Fig. 2). The dislocations were reduced under intravenous sedation using Kocher's method (traction, flexion, abduction with external rotation, then adduction and internal rotation). The reductions were stable and subsequent X-ray film showed anatomic reduction without fractures (Fig. 3). Arm chest bandage immobilized the parts in full internal rotation for 3 weeks followed by physiotherapy. Progressive mobilization was started at 3 weeks with pendulum exercises and the upper limbs were placed in bilateral slings for 6 weeks. Patient regained nearly a full



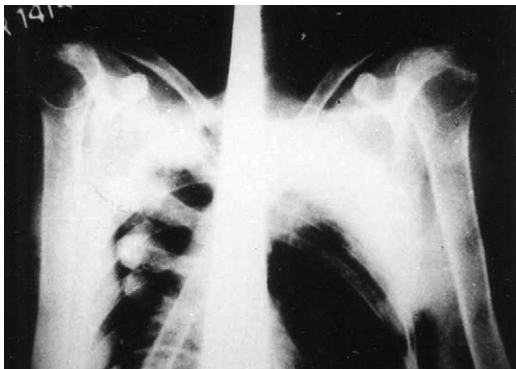
Figure 1 Pictorial depiction of the mode of injury in the patient.

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**Figure 2** Anteroposterior radiograph showing bilateral shoulder dislocation.



**Figure 3** Post reduction radiograph shows anatomical reductions of both the shoulders.

range of motion in both shoulders at three months. The patient had no instability of shoulders on the last follow up at 3 years. There was no recurrence of the dislocation.

## Discussion

We are reporting the case of traumatic bilateral anterior dislocation of the shoulders caused by backward traction of the upper limbs. The reported causes of injury resulting in bilateral anterior dislocation or fracture dislocation of the shoulders and probable mechanisms are enumerated in the [Table 1](#). Unusual causes of bilateral anterior dislocations have also been reported in the literature. Sharma et al reported a case of bilateral simultaneous anterior fracture-dislocation of the shoulders after fall of a heavy object over his back while patient was leaning forward holding an overhead bar.<sup>19</sup> Forward traction has been reported to cause bilateral anterior dislocation of the shoulders.<sup>13,18,21</sup>

The forces required to produce bilateral dislocation must act synchronously and in a similar manner at both joints.<sup>5</sup> The forces acting on both shoulders simultaneously may produce bilateral dislocation from several mechanisms.<sup>1</sup> The usual mechanism of unilateral anterior dislocation of the shoulder is forced extension, abduction and external rotation of the arm causing impingement of the greater tuberosity on the acromion and thus levering the humeral head out of the glenoid.<sup>6</sup> With increased forces the impingement may cause greater tuberosity fracture. The most common mechanisms producing bilateral dislocation or fracture-dislocation of the shoulder are sudden muscular contractions and violent bilateral traction, or bilateral deceleration forces associated with trauma.<sup>1,6</sup> Acute muscular contractions may be produced during seizures, epilepsy or an electric shock.<sup>6,7,11</sup> The mechanism of the dislocation in seizures is abduction, extension, and external rotation caused by indirect trauma<sup>7,11,22</sup> or direct trauma.<sup>16</sup>

**Table 1** Causes and mechanisms of bilateral anterior shoulder dislocation or fracture dislocations

Sr. no.	Author	Number of cases	(Patient no.) Cause of injury	Mechanism of dislocation	(Patient no.) associated fractures
1	Peiro et al. <sup>15</sup>	1	Cleaning cement mixing machine	Forced hyperabduction	None
2	McFie <sup>13</sup>	1	Direct forward traction (motorcycle)	Outstretched, internally rotated	None
3	Yadav <sup>22</sup>	1	Seizure	Abduction and external rotation	Bilateral greater tuberosity
4	Segal et al. <sup>18</sup>	3	(1) Seizure (2) Seizure and fall  (3) Direct forward traction during water skiing	Abduction and external rotation or abduction with hyperextension	(1) None (2) Bilateral greater tuberosity (3) None
5	Carew-McColl <sup>2</sup>	1	Electric shock	NQ	Bilateral greater tuberosity
6	Salem <sup>17</sup>	1	Electric shock	NQ	Bilateral greater tuberosity
7	Hartney-Velazco et al. <sup>7</sup>	1	Seizure, drug (cocaine) induced	Abduction, external rotation, extension	None

Table 1 (Continued)

Sr. no.	Author	Number of cases	(Patient no.) Cause of injury	Mechanism of dislocation	(Patient no.) associated fractures
8	Brown <sup>1</sup>	7	(1) Fall with hands in pockets (2) Tractor accident, anoxic convulsion (3) Fall on outstretched hands (4) Buried with soil, anoxic convulsion (5) Fall with hands in pockets (6) Fall from bus stairs (7) Seizure	Extension; abduction and internal rotation NQ NQ NQ Extension; abduction and internal rotation NQ NQ	(1) None (2) Bilateral greater tuberosity (3) None (4) Fracture of right greater tuberosity (5) Fracture of left greater tuberosity (6) Fracture of right greater tuberosity (7) None
9	Ribbans <sup>16</sup>	1	Grand-mal convulsion	Hyperextension in abduction and external rotation	None
10	Maffulli and Mikhail <sup>10</sup>	1	Weight lifting	Hyper-abduction	None
11	Costigan <sup>3</sup>	1	Old undiagnosed	Unknown cause	None
12	Lal et al. <sup>8</sup>	2	(1) Fall on outstretched hands (2) Fall from height	Abduction and external rotation NQ	(1) Bilateral greater tuberosity (2) Bilateral greater tuberosity
13	Markel and Blasier <sup>11</sup>	1	Grand-mal seizure	Abduction, extension and external rotation	Bilateral greater tuberosity
14	Thomas and Graham <sup>20</sup>	1	Fall on outstretched hands	NQ	Bilateral greater tuberosity
15	Creswell and Smith <sup>5</sup>	1	While using a "free weights" bar in the bench press position	Hyperextension in abduction	None
16	Dinopoulos et al. <sup>6</sup>	1	Fall on outstretched hands	Abduction, extension	Three part fracture of right humerus
17	Cottias et al. <sup>4</sup>	1	Hypoglycemia-induced convulsion	NQ	Bilateral greater tuberosity and coracoid fractures
18	Sharma et al. <sup>19</sup>	1	Heavy object falling over his back	Abduction and external rotation	Three part fracture of both humeri
19	Turhan and Demirel <sup>21</sup>	1	Forward traction during a fall while horse riding	Flexion, abduction and internal rotation	None
20	Siwach et al. (present report)	1	Backward pull by animal	Hyperextension in adduction and internal rotation	None

NQ, not quoted.

Forced extension, abduction, and external rotation of the arm have also been reported to cause bilateral anterior shoulder dislocation after trauma.<sup>19</sup> Simultaneous deceleration forces directed along the length of each arm can dislocate the humeral heads anteriorly, e.g. during a fall on the outstretched hands.<sup>1,6</sup> Direct forward traction of outstretched, internally rotated arms can cause bilateral ante-

rior dislocation of the shoulders.<sup>13,18,21</sup> The shoulders were dislocated by a violent traction when shoulders were in internal rotation and flexion in sagittal plane and slight abduction in coronal plane.<sup>21</sup> The other reported mechanisms of the bilateral dislocation are forced abduction and external rotation<sup>18</sup>; and forced hyperextension in abduction.<sup>5,10,18</sup> Forced hyperabduction, when the acromion acts

as a pivot to lever the humeral head outside the joint, can cause erect dislocation.<sup>15</sup> Cresswell and Smith reported a case in which the fulcrum for the dislocation was not the acromion, but the fixed weight bench.<sup>5</sup>

To establish the possible mechanism of dislocation in the present case we performed manipulations on both the shoulders of a cadaver and observed it under the image intensifier. Similar manipulations were also done on articulated skeletal specimens. It was observed that if the hands are kept crossed behind the back i.e. in adduction and full internal rotation of the arms, and then if the arms are moved in the increasing arc of extension in this position of upper limbs—a pivotal point is reached. At this point, the neck of humerus impinges on the acromion angle, and if the extension forces are sudden, strong and exceed beyond this pivotal point — an ultimate position of instability is reached, which causes humeral head to dislocate at an area — diagonally opposite to it i.e. anteroinferiorly. To the best of our knowledge, this mechanism of glenohumeral dislocation by hyperextension of adducted and internally rotated arms have not been previously reported.

This case report highlights an unusual case of bilateral anterior shoulder dislocation as a result of simultaneous forced hyperextension of adducted and hyperextended upper extremities.

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