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Results of treatment of luxatio erecta (inferior shoulder dislocation)

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Hypothesis: Traumatic inferior shoulder dislocation (luxatio erecta) injuries are rare, comprising less than 0.5% of all shoulder dislocations. Few cases have been reported, and the outcome of treatment has been ill defined.

Materials and methods: Between 1968 and 2000, 18 patients (20 shoulders) with luxatio erecta were evaluated at our institution. Two patients (2 shoulders) were lost to follow-up, leaving 16 patients (18 shoulders) for long-term follow-up (average, 9 years). Associated injuries included peripheral nerve injury, humeral fracture, acromial fracture, and rotator cuff tear. All patients were initially managed with closed reduction, which was successful in 9 shoulders. The remaining 9 shoulders required operative treatment.

Results: Patients were evaluated with respected to pain, function, range of motion, strength, and patient satisfaction, according to the University of California at Los Angeles Rating Scale. Overall, 13 of the 16 patients were graded as good or excellent. Patients treated with closed reduction or operative treatment compared favorably in terms of improvements in ratings for pain, strength, motion, and the ability to perform work and sports.

Discussion: Our experience suggests that treatment of luxatio erecta is largely successful, with good or excellent results obtained in 83% of the shoulders. Half of the patients evaluated, required only closed reduction as their definitive treatment. Operative treatment is typically indicated for associated displaced humeral head fractures or patients with recurrent instability. Recurrent instability appears to be more likely in patients with a previous history of dislocation. Associated neurologic or vascular injury did not affect the final outcome.

Level of evidence: Level IV; Case Series; Therapeutic Study

Keywords: Luxatio erecta; inferior shoulder dislocation; results of treatment

Glenohumeral dislocations have been classified on the basis of anatomy and etiology, with traumatic inferior dislocations (luxatio erecta) being the least common type of injury, compromising approximately 0.5% of all shoulder dislocations.[13,15] The infrequency of this injury has led to a scarcity of reports detailing its treatment and outcome.[4,10] To our knowledge, this report represents the largest series of patients treated for inferior shoulder dislocation at a single institution. The purpose of our report is to review the results of treatment in patients with luxatio erecta.

Materials and methods

This investigation was preformed at the Shoulder and Elbow Service, University of Texas Health Science Center at San

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Table I Demographic data of patients with inferior shoulder dislocation and outcome of treatment

Pt	Age	Sex	Side	FF°	Prev dislocation	Mechanism of injury	Associated injury	Treatment	Follow- up	Outcome	UCLA Score
1	17	M	L	165	No	MCA	Med/rad ulnar nerve	Closed reduction	12 mon	Good	31
2	17	M	R	165	No	Fall, bull riding	Ulnar/ muscle nerve	Closed reduction	22 y	Good	30
3	24	M	L	175	No	MVA	Biceps dislocation	Closed reduction	36 mon	Excellent	35
4	25	M	R	165	No	MCA	None	Closed reduction	22 y	Good	31
5	23	M	R	165	No	MCA	None	Closed reduction	16 mon	Good	31
6	59	M	B	140	No	Fall, ladder	Bilateral RCT	Closed reduction	12 mon	Fair	26
7	32	M	R	145	Yes	Fall, mountain climbing	None	Closed reduction	7 y	Fair	27
8	25	M	R	155	No	MVA	None	Closed reduction	3 y	Good	30
9	60	M	L	155	No	Fall, bike	GT fracture ax nerve	Capsular recon	2 y	Good	30
10	27	M	L	170	No	MCA	Ax/radial nerve, RTC tear	Capsular recon w/RTC rep	15 y	Excellent	35
11	17	M	R	170	Yes	Basketball	Ax nerve	Capsular recon.	3 y	Excellent	35
12	66	F	R	150	No	Fall, ladder	Head split humeral fracture	Hemiarthroplasty	8 y	Good	30
13	16	M	R	160	Yes	Skiing	None	Capsular recon	32 y	Good	30
14	16	F	R	160	Yes	Basketball	None	Capsular recon	2 y	Excellent	34
15	40	M	B	145	No	Fall, ladder	Ax nerve	Capsular recon	40 mon	Fair	27
16	18	F	R	175	No	MVA	Ax/rad/ muscle nerve	Capsular recon	32 mon	Excellent	35

Ax, axillary; *B,* both; *F,* female; *FF,* forward flexion; *L,* left; *M,* male; *MCA,* motorcycle accident; *MVA,* motor vehicle accident; *R,* right; *RTC,* rotator cuff tear; *UCLA,* University of California, Los Angeles.

Antonio and was approved by the Institutional Review Board (IRB Number HSC20080269H).

Between 1968 and 2000, 18 patients (20 shoulders) with luxatio erecta were treated by the senior author (C.A.R.) at our institution. Two patients (2 shoulders) were lost to follow-up, leaving 16 patients (13 men, 3 women; 18 shoulders), available for evaluation (Table I). The medical records and radiographic studies were reviewed by the authors. A University of California, Los Angeles (UCLA) Rating Scale score was calculated for each patient from the medical review and an outcome was assessed based on the score.[2,9]

The average age at the time of treatment was 31 years (range, 16 to 66 years). The injuries were to the left shoulder in 4 patients, right shoulder in 10, and bilateral shoulders in 2. The mechanism of injury was motor vehicle accident in 7, sporting injury in 5, and fall from height in 4.

Signs and symptoms related to the injury were numerous. All patients had pain in the region of the glenohumeral joint. Other associated injuries (Table I) included humeral head fracture in 3, biceps tendon dislocation in 1, rotator cuff tear in 1 patient with bilateral shoulders and 1 other patient, a nondisplaced greater tuberosity fracture with associated axillary nerve palsy in 1, axillary nerve palsy in 2 additional patients, combined axillary and radial nerve palsy in 2 patients, brachial plexus injury involving the musculocutaneous, radial and ulnar nerves in 1, and injury to the ulnar and musculocutaneous nerve in 1. Electrodiagnostic studies had been performed in 2 patients.

Vascular changes were noted in 7 patients. Radial and ulnar pulses were absent in 1 patient, accompanied by cyanosis of the involved arm, and 6 others were noted to have diminished pulses of the involved extremity on initial examination. Resolution of vascular changes occurred in all patients after closed reduction. Angiography was not used.

The initial treatment consisted of closed reduction with the patient under conscious sedation. Four patients required general anesthesia after closed reduction failed. The reduction technique[10] used traction in line with the humerus, followed by gentle adduction after the humeral head had been disengaged. It is important to emphasize that traction always preceded extension of the arm to prevent the humeral head from impinging on the inferior aspect of the glenoid. Reduction of the dislocation was confirmed by anteroposterior and axillary lateral radiographs of the shoulder. Arthrography was used postoperatively in 2 patients.

A shoulder immobilizer was used for 10 to 14 days after reduction. Gentle pendulum exercises were initiated within 48 hours of reduction. Passive range of motion and isometric deltoid exercises were added at 2 weeks after injury, and a physician-directed rotator cuff strengthening program was initiated at 6 weeks.[3]

Operative management in this group included a patient who underwent a hemiarthroplasty for a head splitting fracture after his dislocation had been reduced. Recurrent instability of the injured shoulder developed in 6 patients, who were treated with a capsular reconstruction[14] at an average of 4 months (range, 1-15 months) after injury. One patient with recurrent instability of the shoulder required repair of a rotator cuff in addition to capsular reconstruction. No complications unique to the reconstruction were noted.

Postoperative treatment after capsular reconstruction or hemiarthroplasty included institution of pendulum exercises on the first day after surgery. Passive range of motion and isometric deltoid exercises were begun 2 weeks after reconstruction, and a physician-directed rotator cuff strengthening program was instituted at 6 weeks.[3]

Results

The average length of follow-up was 9 years (range, 12 months-32 years). Average forward elevation was 160° (range, 140°-175°). Results were evaluated with respect to pain, function, range of motion, strength, and patient satisfaction according to the UCLA Rating Scale.[2] The mean shoulder score was 31 points (range, 26-35 points). The rating of 13 of the 16 patients was graded as good or excellent, with considerable improvement in the ratings for pain, strength, motion, and the ability to complete daily work and sports activity.[9] Occasional or no pain was noted in 10 patients, and there was mild pain with overhead use of the arm in 6 shoulders. All patients demonstrated greater than 140° of active elevation and were satisfied with the results of treatment.

Discussion

Luxatio erecta is a relatively rare injury, accounting for only 0.5% of all shoulder dislocations.[13,15] To our knowledge, fewer than 150 patients have been reported.[7,8,13,15] Previous descriptions of luxatio erecta, most of which can be found in case reports, offer a varying picture of clinical symptoms, treatment options, outcome, and long-term results.

The review of our experience with treatment of luxatio erecta mirrors earlier findings reported by Mallon.[7] A peripheral nerve injury associated with the dislocation was sustained in 8 of the 18 shoulders we reviewed, and 6 involved the axillary nerve. These nerve injuries resolved after successful reduction between 1 day and 6 months. Associated nerve injuries were not associated with less favorable results.

Our incidence of vascular status changes associated with inferior shoulder dislocation is higher than previous reports.[1,6,7] Before treatment, 7 patients presented with changes in vascular status to the involved extremity. We observed that these changes in vascular status returned to normal after closed reduction, and no patient required operative management for any vascular sequelae. No patients in this series were treated with anticoagulant therapy.[5]

Arthrography was used in 3 patients, and 2 demonstrated 3 rotator cuff tears. The incidence of these associated injuries is significantly lower than previous reports[7,11,12] This incidence may be explained by the patient age: few of our patients with luxatio erecta were aged older than 40 years. It may also reflect the historical bias at our institution, which used ancillary imaging at a lower rate than currently used.

Of the 4 patients with previous shoulder dislocation, 3 (3 shoulders) underwent capsular reconstruction for instability with 1 good and 2 excellent results. One patient was treated with closed reduction and was graded as a fair result at final follow up. Our experience indicates that recurrent instability after an inferior dislocation is more likely in patients with a history of dislocation and that capsular repair is indicated for these patients in the treatment of luxatio erecta.

In conclusion, the long-term results of treatment of luxatio erecta appear to be good, in contrast to the reports of other authors.[11] Closed reduction served as the definitive treatment for 50% of the patients in this series. Recurrent instability requiring capsular reconstruction seems to be more prevalent in patients with a previous history of shoulder dislocation. Dislocations associated neurologic injury and vascular status changes did not affect the final outcome.

Disclaimer

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