

SYSTEMATIC REVIEW**Bilateral Anterior Shoulder Dislocation:
A Systematic Review**

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*Research performed at Department of Orthopedic Surgery, Washington University in St. Louis MO, USA**Received: 8 October 2022**Accepted: 7 March 2024***Abstract****Objectives:** To compile the existing literature on bilateral anterior shoulder dislocation (BASD) and analyze patient demographics, mechanisms of injury, injury characteristics, management, and outcome.**Methods:** This systematic review was conducted in accordance with Preferred Reporting Items for Systematic review and Meta-Analyses (PRISMA) guidelines. Online databases, including Ovid Medline 1946-, Embase.com 1947-, Scopus 1960-, Cochrane Central, and Clinicaltrials.gov were systematically queried. Studies eligible for inclusion were case reports or case-series, documenting BASD. Two reviewers independently screened and applied a set of a priori exclusion criteria to each returned study. Data were extracted, compiled, and synthesized from each reported case of BASD. Contingency tables/Chi-Square Analyses, T-tests, and univariate regression analyses were conducted to assess relationships between different variables.**Results:** Eighty-one studies (87 cases of BASD) were included. Patients were 41.1 (SD± 19.5) years old and most were male (n=63; 72.4%). Around a quarter of patients (28.7%) had a history of epilepsy/seizures or were being worked-up for such. Younger males were more likely to have BASD due to a seizure or electrocution (P<0.05). Close to a third of cases (n=27; 31.0%) were delayed in presentation. Those sustaining seizures or electrocutions were more likely to be delayed in presentation (P=0.013). Most events resulted in simple dislocations that were closed reduced successfully. BASD resulting from seizures or electrocutions were more likely to be fracture-dislocations (P=0.018); and in younger patients with fracture-dislocations, closed reduction was more often to fail or not be attempted (P<0.05). Median follow-up was 6 months (IQR: 3 months – 12 months). Seven patients (10.6%) had complications and 4 (2.3%) demonstrated recurrent instability.**Conclusion:** In young males presenting with BASD without known trauma, suspicion should be high for a convulsant event. In patients with a known seizure disorder who present with chronic bilateral shoulder or arm pain, BASD should be considered and work-up should be expedited to avoid misdiagnosis.**Level of evidence:** V**Keywords:** Bilateral, Dislocation, Instability, Shoulder, Systematic review, Trauma**Introduction**

Over 50% of all dislocations presenting to emergency departments are glenohumeral dislocations,¹ and are more frequent than dislocations of the elbow, wrist, fingers, hip or knee.² The glenohumeral joint is the most mobile joint in the body, and thus relies on numerous static and dynamic stabilizers to prevent subluxation or frank dislocation.³⁻⁵ The static stabilizing structures include the glenoid and labrum,

glenohumeral ligaments, and joint capsule, and the dynamic stabilizers include the rotator cuff, long head of biceps, and scapular muscles.⁶ These structures ultimately provide a combination of glenoid concavity compression and scapulohumeral balance to provide stability at the glenohumeral joint in various positions of range of

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motion.⁷⁻⁹

The estimated incidence of shoulder dislocations in the United States is 23.9 per 100,000 person years.¹⁰ Simultaneous bilateral anterior shoulder dislocations (BASD) are a rare entity, and the majority of published literature to date are either case reports or case series. These reports are heterogenous in nature and to date, cases have not been systematically compiled and analyzed. Therefore, the purpose of this systematic review was to examine and synthesize the existing literature on BASD in order to better understand patient demographics, mechanisms, injury characteristics, management, and outcomes following these events.

Materials and Methods

Information Sources

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic review and Meta-Analyses (PRISMA) 2020 guidelines.¹¹ The published literature was searched utilizing strategies devised by a medical librarian (MMD) for articles related to BASD. The search strategies were established using a combination of standardized terms and key words, including but not limited to bilateral AND anterior AND (shoulder dislocation OR glenohumeral subluxation OR humeroscapular luxation). The search was run in May 2021 without any filters in the databases Ovid Medline 1946-, Embase.com 1947-, Scopus 1960-, Cochrane Central, and Clinicaltrials.gov. Full

electronic search strategies are provided in the Appendix [Appendix].

Eligibility Criteria

Studies eligible for inclusion were case reports or case-series, documenting BASD. Studies that were not related to BASD (e.g dislocations that were unilateral, bilateral posterior, or divergent, meaning one anterior and one posterior) were not included.

Selection Process

Two reviewers (AWK, EKL) independently screened and applied a set of *a priori* exclusion criteria to each study that met the above inclusion criteria. Reviewers were blinded to each other's screening process. Studies that were (1) not in English, (2) were abstract or conference proceedings, review papers, or (3) did not have a full text available, were excluded from the analysis. If the two reviewers could not reach agreement on the classification of a study, a 3rd reviewer (PMI) acted as an arbitrator.

Data Elements

The following data elements listed in Table 1 were extracted for each included study by three of the authors (AWK, EKL, JKY) and collected in a Microsoft Excel Spreadsheet (Microsoft Corporation; Redmond, WA, USA) [Table 1]. If a study included multiple cases of BASD, data elements (aside from publication characteristics) were collected for each case, separately.

Table 1. Data elements extracted from each BASD case

Domain	Data Element
Publication Characteristics	Year Published
	Journal Published
	Country of Origin
Patient Demographics	Age
	Gender
	Ethnicity/Race
	Body Mass Index (BMI)
	Medical History (Including Prior Shoulder Instability Events and Surgeries)
BASD Mechanism	Mechanism and Witnessed or Not
	History of Repeated Mechanism
	Other Injuries
	Time from Injury to Presentation
BASD	Imaging (XR, CT)
	Right Shoulder Dislocation vs. Fracture/Dislocation (Right Shoulder Fracture/Dislocation Pattern)
	Left Shoulder Dislocation vs. Fracture/Dislocation (Left Shoulder Fracture/Dislocation Pattern)
	Right Shoulder Neurovascular Injury
	Left Shoulder Neurovascular Injury
	Right Shoulder Closed Management (Successful vs. Unsuccessful)
Management and Outcomes	Left Shoulder Closed Management (Successful vs. Unsuccessful)
	Right Shoulder Surgical Procedure(s)
	Left Shoulder Surgical Procedure(s)
	Length of Follow-Up

Management and Outcomes	Patient Reported Outcome Measurements Recorded
	Improvement Clinically or in Patient Reported Outcome Measurements
	Recurrence/Instability
	Complications

XR = x-ray; CT = computed tomography

Studies included were all case reports or case series and thus, we did not perform any formal analysis of bias. Data were synthesized and summary statistics were reported including counts (%), means (standard deviation; SD), and medians (interquartile range; IQR) where appropriate. Contingency tables/Chi-Square analyses, t-tests, and univariate regression analyses were conducted to assess relationships between different variables. All analyses were conducted at the 95% confidence interval (CI) level with the statistical software program IBM® SPSS v27.0 (IBM; Armonk, NY, USA)

were returned. Two-hundred and two (202) duplicates were identified and removed for a total of 194 different citations. Of these 194 citations, 108 studies met the initial inclusion criteria. Of these, the two raters reached 98.5% agreement in screening, with a Cohen's Kappa demonstrating "near perfect" agreement ($\kappa=0.97$). After deliberation between the two authors, 100% agreement was obtained on inclusion/exclusion and 81 were included for analysis.¹²⁻⁹² the inclusion/exclusion flow diagram is illustrated in Figure 1 [Figure 1].

Results

Study Selection

From the initial database searches, a total of 396 citations

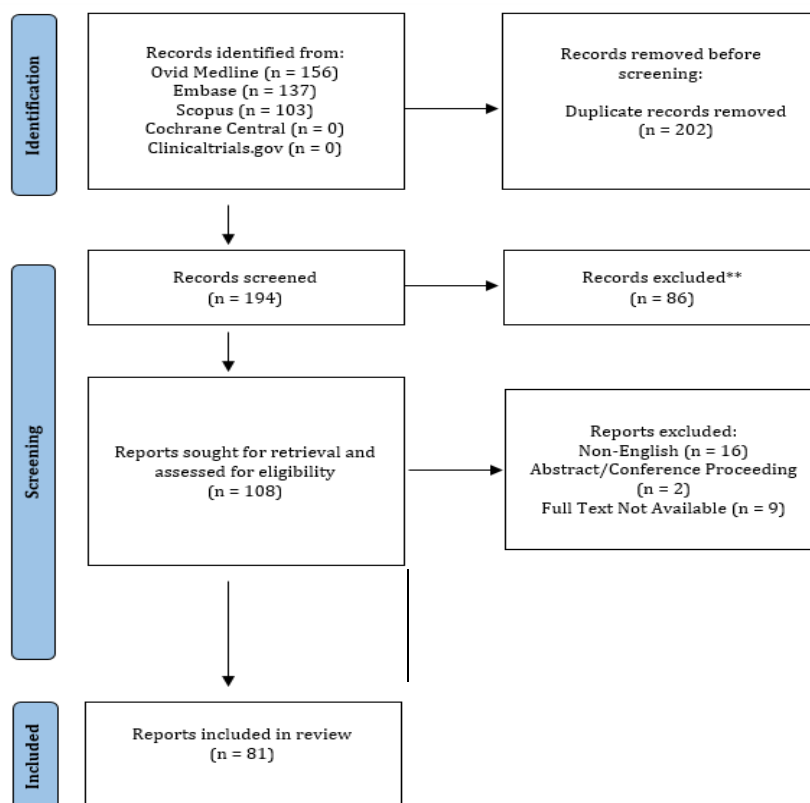


Figure 1. Study identification and inclusion/exclusion criteria

Study Characteristics

The earliest publication on bilateral anterior shoulder dislocation (BASD) included in this systematic review was

from 1976.⁵⁵ Half of all publications included were published over the last decade (n=41; 50.6%) [Figure 2].

The 81 studies were published in 59 different journals, most commonly in Journal of Orthopaedic Case Reports (n=8;

9.9%), Injury (n=5; 6.2%), and BMJ Case Reports (n=4; 4.9%). Most studies were from India (n=19, 23.5%), the United Kingdom (n=18, 22.2%), and the United States (n=11, 13.6%), but 22 total countries contributed to the literature base. Publication characteristics are delineated in Table 2 [Table 2]. Specifics can be found in the [Appendix, Table S1].

Patient Demographics

(n=49; 56.3%). Some had a known history of epilepsy/seizures (n=12; 13.8%) and a similar number were being worked up for new onset seizures/undiagnosed seizure disorders (n=13; 14.9%). Four (n=4; 4.6%) had diabetes at the time of presentation and a small proportion

The 81 studies reported on 87 total cases of BASD. The mean age of patients was 41.1 (SD ± 19.5) and most were male (n=63; 72.4%). Females with BASD were significantly older in age compared to males. [59.4 (SD±20.8) vs. 34.2 (SD ±13.7); t (85) = 6.60, P=0.002] A small minority of cases reported ethnicity/race (n=2; 2.3%) and BMI (n=3; 3.5%). The majority of patients had no reported medical history

of patients had previous shoulder dislocations/instability events. (n=8; 9.2%) Demographic characteristics are summarized in Table 3 [Table 3]. Specifics are delineated in the [Appendix, Table S2].

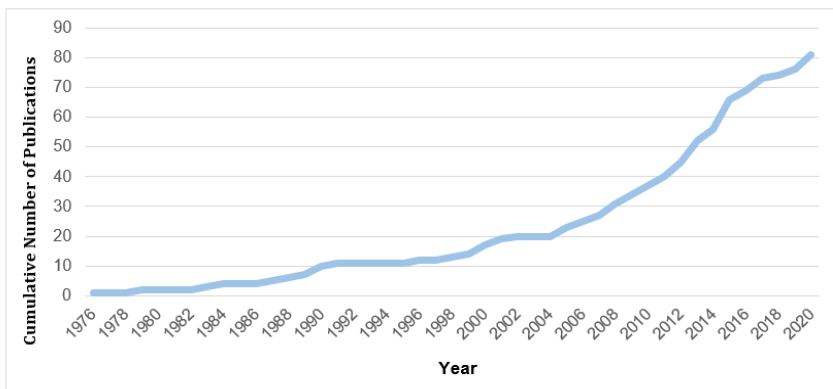


Figure 2. Cumulative number of BASD publications

Table 2. Publication characteristics documenting BASD	
Bibliometric Characteristic	N (%)
Year:	
1971-1980	2 (2.5)
1981-1990	8 (9.9)
1991-2000	7 (8.6)
2001-2010	20 (24.7)
2011-Present	44 (54.3)
Journal (JIF):	
Journal of Orthopaedic Case Reports (NA)	8 (9.9)
Injury (2.5)	5 (6.2)
BMJ Case Reports (0.9)	4 (4.9)
American Journal of Emergency Medicine (3.6)	3 (3.7)
Archives of Orthopaedic and Trauma Surgery (2.3)	3 (3.7)
British Journal of Sports Medicine (18.6)	2 (2.5)
Chinese Journal of Traumatology (2.1)	2 (2.5)
European Journal of Orthopaedic Surgery and Traumatology (1.7)	2 (2.5)
Journal of Emergency Medicine (1.5)	2 (2.5)
Other**	27 (33.3)
Country of Origin:	
India	19 (23.5)
United Kingdom	18 (22.2)
United States	11 (13.6)
Turkey	5 (6.2)
Iran	2 (2.5)
Morocco	3 (3.7)
China	2 (2.5)
Chinese Taipei	2 (2.5)
Greece	2 (2.5)
Lebanon	2 (2.5)
Nigeria	2 (2.5)
Spain	2 (2.5)
Other**	9 (11.1)

**Each journal or country with a single publication/ JIF = Journal Impact Factor (2022)/ NA = Not Available

Table 3. BASD patient demographics

Demographic Characteristic	Mean (\pm SD), n (%)
Age	41.1 (\pm 19.5)
Gender	
Female	
Male	24 (27.6) 63 (72.4)
Ethnicity/Race	
Caucasian	2 (2.3)
Not Reported	85 (97.7)
BMI	28.2 (\pm 3.4)
Medical History	
Undiagnosed Seizure Disorder	13 (14.9)
Epilepsy/Seizures	12 (13.8)
Hypertension/Cardiovascular Disease/TIA/Cardiac Surgery	6 (6.9)
Diabetes	4 (4.6)
Other	6 (6.9)
None/Not Reported	49 (56.3)
Previous Shoulder Dislocations/Instability	
Yes	8 (9.2)
None/Not Reported	79 (90.8)

BMI = body mass index; TIA = transient ischemic attack

Mechanism of Injury/Event

The most common mechanisms leading to BASD were seizure or electrocution with a fall. Seven (8.0%) were due to a mechanism that included a push forward (e.g bench press or rising from the floor) and 5 (5.7%) were due to a mechanism where the arms were extended overhead (e.g hanging onto a bar, military press, etc.). Those who had a BASD resulting from seizures or electrocution were more often males [51.7% of males vs. 22.7% of females; χ^2 (1, N = 83), =6.06, P=0.014] and younger in age [30.4 (SD \pm 8.46) vs. 49.7 (SD \pm 21.1); t (81) = 5.16, P<0.001] than those who had a BASD resulting from other mechanisms. A quarter of cases were reported or assumed to be witnessed by others (n=22;

seizures or electrocutions (n=30; 34.5%) and mechanical falls (n=23; 26.4%). Five (5.7%) were due to a combined 25.3%). Most events did not result in other additional injuries (n=80; 92.0%). Almost a third of cases (n=27; 31.0%) were chronic dislocations and delayed in presentation. The median delay in presentation for these cases was 30 days (IQR: 13-106.5 days). Those who had seizures or electrocution were more likely to have a delayed presentation. [44.4% of seizures or electrocutions vs. 19.1% of other mechanisms; χ^2 (1, N = 83), =6.20, P=0.013]. Data regarding the BASD events are summarized in Table 4 below [Table 4]. Specifics regarding mechanisms or injury and the additional injuries can be found in the [Appendix Table S3].

Table 4. Mechanism of Injury and Event Details for BASD

Event Characteristic	n (%), Median (IQR)
Mechanism	
Seizure or Electrocution	30 (34.5)
Fall	23 (26.4)
Combined Seizure or Electrocution and Fall	5 (5.7)
Push Forward	7 (8.0)
Arms Extended Overhead/Hanging	5 (5.7)
Other	17 (19.5)
Witnessed	
Yes	22 (25.3)
No/Not Reported	65 (74.7)
Concomitant Injuries	
Facial Injury	5 (5.7)
Sternal Fracture	1 (1.1)
TMJ Dislocation	1 (1.1)
None	80 (92.0)
Presentation	
Not Delayed	60 (67.0)
Delayed	27 (31.0)
Median Delay in Presentation	30 days (13-106.5 days)

TMJ = temporomandibular joint

BASD Characteristics and Work-Up

Initial imaging primarily consisted of plain films only (n=69; 79.3%). A smaller proportion received both plain films and computed tomography (CT) imaging (n=17; 19.5%). Simple dislocations were more frequent (n=109; 62.6%) compared to fracture-dislocations (n=55; 31.6%). Fracture-dislocations commonly involved the greater tuberosity (n=47; 83.9 %) and less often the coracoid, lesser tuberosity, and neck. Those who had fracture-dislocations were significantly younger than those who had frank dislocations. [40.3 (SD±16.2) vs. 41.7 (SD±21.4); t (85) = .311, P=0.013].

Additionally, those with seizures or electrocutions were more likely to have a fracture-dislocation. [55.5% of seizures or electrocutions vs. 29.8% of other mechanisms; χ^2 (1, N = 83), =5.60 P=0.018.] Gender was not significantly associated with injury pattern. [χ^2 (1, N = 87), =1.39 P=0.242]. There were 10 patients (11.5%) with neurologic findings/injuries. Neither mechanism [χ^2 (1, N = 83), =1.34 P=0.247] nor a delayed presentation were associated with the presence of neurologic findings/injury. [χ^2 (1, N = 87), =2.34, P=0.126]. Data regarding BASD injury characteristics and work-up can be found in Table 5 [Table 5]. Specifics can be found in the [Appendix, Table S4].

outcome data can be found in Table 6 [Table 6]. Specifics can

Management and Outcomes

The majority of BASD were successfully closed reduced (n=135; 77.6%). Reductions occurred in a variety of settings, most commonly the emergency department or operating room, and under conscious or general sedation. The others (n=39; 22.4%) either had a failed closed reduction or a closed reduction was not attempted. Those with BASD resulting from seizures or electrocutions [33.3% seizures or electrocutions vs. 14.9% other mechanisms; χ^2 (1, N = 83), =3.93, P=0.048] and those who had fracture-dislocations [38.2% fracture-dislocations vs. 15.1% dislocations; χ^2 (1, N = 87), =6.06, P=0.014] were more likely to have a failed closed reduction or closed reduction not attempted. For shoulders that required a surgical procedure (n=43; 24.7%), the majority received an open reduction with internal or percutaneous fixation.

A smaller number of shoulders required a stabilization procedure for instability (n=11; 6.3%) or arthroplasty (n=4; 2.3%). Median length of follow-up was 6 months (IQR: 3 months – 12 months). Ten studies (11.5%) included a patient reported outcome measure (PROM). Most studies reported general improvement at last follow-up (n=64; 98.4%). Seven patients (n=7; 10.6%) had complications during the follow-up period. Complications and other management and be found in the [Appendix, Table S5].

Table 5. BASD injury characteristics and work-up

Injury Characteristic	Left, n (%)	Right, n (%)
Imaging		
XR	69 (79.3)	
XR + CT	17 (19.5)	
XR + MRI	1 (1.1)	
Injury Pattern		
Simple Dislocation	61 (79.1)	58 (66.7)
Fracture-Dislocation	26 (29.9)	29 (33.3)
Neck	0 (0.0)	1 (1.1)
Coracoid	2 (2.3)	2 (2.3)
GT + Coracoid	1 (1.1)	1 (1.1)
GT	18 (20.7)	19 (21.8)
GT + Neck	2 (2.3)	3 (3.4)
GT + LT + Neck	2 (2.3)	1 (1.1)
Unspecified	1 (1.1)	2 (2.3)
Neurovascular Injury		
Yes	10 (11.5)	10 (11.5)
Axillary Nerve Palsy	1 (1.1)	1 (1.1)
Median Nerve Palsy	0 (0.0)	1 (1.1)
Axillary Nerve Paresthesias	4 (4.6)	4 (4.6)
General Paresthesias	1 (1.1)	1 (1.1)
Ulnar Nerve Paresthesias	1 (1.1)	2 (2.3)
Unspecified Brachial Plexus	2 (2.3)	2 (2.3)
Lower Posterior Cord Injury	1 (1.1)	0 (0.0)
No	77 (88.5)	77 (88.5)

XR = x-ray; CT = computed tomography; MRI = magnetic resonance imaging; GT = greater tuberosity; LT = lesser tuberosity

Table 6. BASD management and outcomes		
Management or Outcome	Left, n (%)	Right, n (%)
Closed Reduction		
Successful	68 (78.2)	67 (77.0)
Failed/Not Attempted	19 (21.8)	20 (23.0)
Procedure		
None	66 (75.9)	65 (74.7)
Open Reduction Only	2 (2.3)	1 (1.1)
Open Reduction with Fixation	13 (14.9)	12 (13.8)
Stabilization (Instability) Procedure	5 (5.7)	6 (6.9)
Rotator Cuff Repair, SAD, BT	2 (2.3)	3 (3.4)
Arthroplasty (HA/RTSA)	3 (3.4)	1 (1.1)
Other	3 (3.4)	3 (3.4)
Follow-up (months)		
	6 months (IQR: 3-12 months)	
Patient Reported Outcomes		
Included		10 (11.5)
Not Included		77 (88.5)
Complications		
AVN		1 (1.1)
Malunion		1 (1.1)
Brachial Plexus Injury		1 (1.1)
Recurrent Dislocation/Instability		5 (5.7)
Symptomatic HW		1 (1.1)
None		80 (92.0)

SAD = subacromial decompression; BT = biceps tenodesis/tenotomy; HA = hemiarthroplasty; RTSA = reverse total shoulder arthroplasty; AVN = avascular necrosis; HW = hardware

Discussion

This systematic review included 81 studies reporting on 87 cases of bilateral anterior shoulder dislocation (BASD), the earliest of which was from 1976. The primary aim was to rare entity. There are many limitations to the current study. This was a systematic review of case-reports and series, thus rendering it level V evidence. The inherent limitations of case reports are also evident here. First, data among studies were collected and reported in a non-heterogenous way, including both in quantity and quality. For example, very limited medical history of patients sustaining these injuries was recorded in the case reports, and pertinent history such as ligamentous laxity may have been a risk factor for primary traumatic anterior shoulder dislocation.⁹³ Furthermore, follow-up was variable and reporting of patient reported outcomes was inconsistent, not allowing for greater understanding of the long-term instability risk of patients who present with BASD. There were no comparative groups. Lastly, cases were reported from all over the world, and these data may not be generalizable to every select population. Despite these limitations, there were some discernable patterns and trends noted.

A little over a quarter of the patients included had a history of epilepsy/seizures or were being worked-up for such. Common teaching is that among patients with posterior instability, patients with seizures comprise a large proportion of this population. However, as demonstrated in the current study and in previous literature, BASD can present after a seizure as well. A recent large epidemiological study examined shoulder injuries in individuals with epileptic seizures and found that those who sustained bilateral shoulder dislocations were equally distributed

identify patterns in patient characteristics, mechanism of injury, workup and management to better understand this

between pure anterior (50%) and posterior (50%) dislocations.⁹⁴ We found that younger males were more likely to have BASD due to a seizure or electrocution. Only a quarter (n=22; 25.3%) of events were reported or assumed to be witnessed. Therefore, in young males with no known trauma or an unwitnessed event, suspicion for seizure should be heightened. Conversely, females with BASD were older and often resulted from falls or other mechanisms.

Close to one-third of BASD cases were delayed in presentation and in our study, those with seizures or electrocutions were more likely to be delayed in presentation, suggesting that in these individuals, BASD is sometimes missed or chronic. This is in accordance with the epilepsy literature, demonstrating that only about 50% of patients present at the time of their first seizure.⁹⁵ Patients with BASD may have also been delayed in presentation because of lack of access to affordable healthcare, particularly those in low- or middle-income counties.⁹⁶ In patients with seizure disorders who present with chronic bilateral shoulder or arm pain, BASD should be considered and work-up including plain films should be expedited. In general, patients presenting with obvious unilateral instability after a seizure should have both shoulders examined to both allow for comparison and exclude bilateral involvement. For all instances of BASD, initial work-up should include plain radiographs. Most BASD events resulted in simple dislocations that could be closed reduced without issue. BASD that resulted from seizures or electrocutions

were more likely to result in fracture-dislocations. In younger patients with fracture-dislocations, closed reduction was more often to fail or not be attempted due to the complexity of fracture pattern and/or need for internal fixation. CT or advanced imaging would likely be greater utilized after a seizure or electrocution event, but should be considered in all cases of fracture-dislocation. For shoulders that required a surgical procedure, the majority received an open reduction with internal or percutaneous fixation. A smaller number of shoulders required a stabilization procedure for instability or arthroplasty. Follow-up was at a median of 6 months, with many reporting suitable outcomes. However, the incidence of instability arthropathy cannot be determined with short-term follow-up. Short-term complications were low in frequency and only 4 shoulders experienced recurrence/instability.

Conclusion

Simultaneous BASD are rare events, and the literature primarily consists of case reports and series. We found that a large proportion of BASD events were due to convulsions, especially in young males. A large proportion of patients present in a delayed manner, especially those with seizures or electrocutions. In patients presenting with unwitnessed atraumatic BASD, there should be an increased suspicion for seizures, and physicians should consider monitoring these patients for recurrent seizures and/or further neurologic work-up. Fracture-dislocations were not uncommon, however, the majority of BASD resulted in

simple dislocations that could be treated successfully with closed means. Short-term outcomes are generally favorable, but there is poor long-term follow-up data on patients who sustain this rare event. Future research should aim to optimize early diagnosis and follow these patients longitudinally to maximize outcomes in those sustaining BASD.

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Appendix:**Search Strategies****Ovid Medline**

156 results on 5/10/21

1. Bilateral*.mp.
2. Anterior*.mp.
3. Exp shoulder dislocation/ OR ((dislocation* OR subluxation* OR dislocated OR luxation OR disarticulation) adj2 (glenohumeral OR shoulder* OR humeroscapular OR scapulohumeral)).mp.
4. 1 AND 2 AND 3

Search Strategies**Embase**

137 results on 5/10/21

((bilateral* NEAR/3 anterior*):ti,ab,kw,de) AND ('shoulder dislocation'/exp OR (((dislocation* OR subluxation* OR dislocated OR luxation OR disarticulation) NEAR/2 (glenohumeral OR shoulder* OR humeroscapular OR scapulohumeral)):ti,ab,kw,de))

OR

(bilateral*:ti,ab,kw,de AND anterior*:ti,ab,kw,de AND (((dislocation* OR subluxation* OR dislocated OR luxation OR disarticulation) NEAR/2 (glenohumeral OR shoulder* OR humeroscapular OR scapulohumeral)):ti,ab,kw))

Scopus

103 results on 5/10/21

1. (TITLE-ABS-KEY (bilateral* w/3 anterior*))
2. (TITLE-ABS-KEY ((dislocation* OR subluxation* OR dislocated OR luxation OR disarticulation) w/5 (glenohumeral OR shoulder* OR humeroscapular OR scapulohumeral)))
3. #1 AND #2

Cochrane Central

0 results on 5/10/21

1. (bilateral* NEAR/3 anterior*):ti,ab,kw
2. ((dislocation* OR subluxation* OR dislocated OR luxation OR disarticulation) NEAR/2 (glenohumeral OR shoulder* OR humeroscapular OR scapulohumeral)):ti,ab,kw
3. 1 AND 2

Clinicaltrials.gov

0 results on 5/10/21

Bilateral anterior shoulder dislocation

Supplemental Tables

Table S1. Publication Characteristics

Authors	Year	Journal	Country of Origin
Abdulkadir et al.	2009	South African Medical Journal	Nigeria
Agrahari et al.	2020	Journal of the Nepal Medical Association	Nepal
Ahmad et al.	2017	Chinese Journal of Traumatology - English Edition	Pakistan
Antri et al.	2020	Pan African Medical Journal	Morocco
Auerbach et al.	2015	The Journal of the American Osteopathic Association	United States
Ballesteros et al.	2013	Journal of Emergency Medicine	Spain
Bellazzini et al.	2007	American Journal of Emergency Medicine	United States
Bremner et al.	2013	Military medicine	United States
Chamseddine et al.	2020	Cureus	Lebanon
Chen et al.	2015	BMC Complementary and Alternative Medicine	Chinese Taipei
Chen et al.	2017	Medicine (United States)	Chinese Taipei
Choulapalle et al.	2015	Case reports in orthopedics	India
Costigan et al.	1990	Injury	United Kingdom
Cottias et al.	2000	Acta Orthopaedica Scandinavica	France
Cresswell et al.	1998	British Journal of Sports Medicine	United Kingdom
Deshpande et al.	2014	Journal of Krishna Institute of Medical Sciences University	India
Devalia et al.	2005	Journal of Postgraduate Medicine	India
Diallo et al.	2020	Clinical Case Reports	Burkina Faso
Dinopoulos et al.	1999	International Orthopaedics	United Kingdom
Dlimi et al.	2012	Journal of Clinical Orthopaedics and Trauma	Morocco
Dlimi et al.	2012	Journal of Orthopaedics and Traumatology	Morocco
Dodds et al.	2008	American journal of orthopedics (Belle Mead, N.J.)	United States
Dunlop et al.	2002	Acta Orthopaedica Belgica	United Kingdom
El Rassi et al.	2015	Archives of Orthopaedic and Trauma Surgery	Lebanon
Esenkaya et al.	2000	Physician and Sportsmedicine	Turkey
Felderman et al.	2009	Journal of Emergency Medicine	United States
Gopinath et al.	2016	Journal International Medical Sciences Academy	India
Hartney-Velazco et al.	1984	Southern Medical Journal	United States
Jones, M.	1987	British Journal of Sports Medicine	United Kingdom
Joseph et al.	2019	Clinical practice and cases in emergency medicine	United States
Kakhki et al.	2015	Razavi International Journal of Medicine	Iran
Kalkan et al.	2009	Acta orthopaedica et traumatologica turcica	Turkey
Karaman et al.	2015	Erciyes Tip Dergisi	Turkey
Kovilazhikathu Sugathan et al.	2012	European Orthopaedics and Traumatology	United Kingdom
Kubiak et al.	2013	Ortopedia, traumatologia, rehabilitacja	Poland
Kumar et al.	2013	Journal of orthopaedic case reports	India
Lasanianos et al.	2008	Cases journal	Greece
Litchfield et al.	1988	Postgraduate Medical Journal	United Kingdom
Madi et al.	2015	BMJ Case Reports	India
Maffulli et al.	1990	Injury	United Kingdom
Manoharan et al.	2014	BMJ Case Reports	United Kingdom
Martin et al.	2016	BMJ Case Reports	United Kingdom
Martínez et al.	2001	European Journal of Orthopaedic Surgery and Traumatology	Spain
McFie	1976	Injury	United Kingdom
Meena et al.	2013	Journal of natural science, biology, and medicine	India
Mehta et al.	1989	Annals of Emergency Medicine	United States

Table S1. Continued

Mofidi et al.	2010	American Journal of Emergency Medicine	Iran
Nagi et al.	1990	Journal of orthopaedic trauma	India
Ng et al.	2000	The Ulster medical journal	United Kingdom
Ngim et al.	2006	West African Journal of Medicine	Nigeria
Nourredine et al.	2013	BMJ Case Reports	United Kingdom
O'Connor-Read et al.	2007	Journal of Medical Case Reports	United Kingdom
Özçelik et al.	2006	Diabetes Research and Clinical Practice	Turkey
Park et al.	2018	Radiology Case Reports	United States
Poggetti et al.	2015	Journal of orthopaedic case reports	Italy
Porecha et al.	2011	European Journal of Orthopaedic Surgery and Traumatology	India
Raptis et al.	2019	Kurume Medical Journal	Greece
Rouhani et al.	2010	Pakistan Journal of Medical Sciences	Iran
Rudy et al.	2017	JAAPA : official journal of the American Academy of Physician Assistants	United States
Sachit et al.	2015	Journal of orthopaedic case reports	India
Salem	1983	Injury	United Kingdom
Schneider et al.	2017	Journal of orthopaedic case reports	United Kingdom
Segal et al.	1979	Clinical Orthopaedics and Related Research	United States
Sharma et al.	2005	Journal of orthopaedic surgery (Hong Kong)	India
Shetty et al.	2014	Nitte University Journal of Health Science	India
Silva et al.	2011	Revista brasileira de ortopedia	Portugal
Singh et al.	2005	European journal of emergency medicine : official journal of the European Society for Emergency Medicine	India
Siu et al.	2014	Archives of trauma research	China
Siwach et al.	2008	Injury Extra	India
Sunku et al.	2012	Journal of orthopaedic case reports	India
Suryavanshi et al.	2012	Journal of orthopaedic case reports	India
Taneja et al.	2013	Clinical Imaging	Brazil
Thakur et al.	2010	Journal of Clinical and Diagnostic Research	India
Thomas et al.	1996	Injury	United Kingdom
Tripathy et al.	2011	Chinese Journal of Traumatology - English Edition	India
Turhan	2008	Archives of Orthopaedic and Trauma Surgery	Turkey
Upasani et al.	2016	Journal of orthopaedic case reports	India
Velkes et al.	1991	Archives of Orthopaedic and Trauma Surgery	Israel
Wheelton et al.	2015	Journal of orthopaedic case reports	United Kingdom
Yuen et al.	2001	American Journal of Emergency Medicine	China
Zoofaghari et al.	2020	Journal of Research in Pharmacy Practice	Iran

Table S2. Patient Demographics

Authors	Age	Gender	Ethnicity/Race	BMI	Reported Medical History	Prior Shoulder Events
Abdulkadir et al.	35	Male	NR	NR	Undiagnosed Seizure Disorder	NR
Agrahari et al.	70	Male	NR	NR	Hypertension	No
Ahmad et al.	20	Male	NR	NR	Epilepsy	NR
Antri et al.	43	Male	NR	NR	None	Yes
Auerbach et al.	61	Female	NR	NR	NR	No
	74	Female	NR	NR	None	NR
Ballesteros et al.	17	Male	NR	NR	None	NR
Bellazzini et al.	20	Male	NR	NR	None	NR
Bremner et al.	28	Male	NR	NR	Hypertension	NR
Chamseddine et al.	28	Male	NR	NR	Epilepsy	NR

Table S2. Continued

Chen et al.	76	Female	NR	NR	Cardiac Surgery	NR
Chen et al.	76	Female	NR	NR	Cardiovascular Disease	No
Choulapalle et al.	40	Male	NR	NR	None	No
Costigan et al.	74	Female	NR	NR	COPD	NR
Cottias et al.	33	Male	NR	NR	Diabetes	NR
Cresswell et al.	31	Male	NR	NR	NR	NR
Deshpande et al.	24	Male	NR	NR	None	NR
Devalia et al.	43	Male	NR	NR	None	No
Diallo et al.	30	Male	NR	NR	Undiagnosed Seizure Disorder	NR
	27	Male	NR	NR	Epilepsy	NR
Dinopoulos et al.	76	Female	NR	NR	None	NR
	76	Female	NR	NR	None	No
Dlimi et al.	20	Male	NR	NR	None	No
Dodds et al.	27	Male	NR	NR	Undiagnosed Seizure Disorder	NR
Dunlop et al.	91	Female	NR	NR	NR	NR
El Rassi et al.	29	Male	NR	NR	Bipolar Disorder, Femur Fracture	NR
Esenkaya et al.	22	Male	NR	25.8	None	No
Felderman et al.	44	Female	NR	NR	None	Yes
Gopinath et al.	30	Male	NR	NR	Epilepsy	NR
Hartney-Velazco et al.	22	Female	NR	NR	NR	NR
Jones, M.	24	Male	NR	NR	NR	NR
Joseph et al.	21	Male	NR	NR	Epilepsy	NR
Kakhki et al.	21	Male	NR	NR	Epilepsy	No
Kalkan et al.	65	Female	NR	NR	NR	NR
	64	Female	NR	NR	NR	NR
Karaman et al.	26	Male	NR	NR	NR	Yes
Kovilazhikathu Sugathan et al.	82	Male	NR	NR	Diabetes, TIA, Hyperlipidemia	No
Kubiak et al.	29	Male	NR	NR	NR	NR
Kumar et al.	45	Female	NR	NR	No	No
Lasanianos et al.	25	Male	NR	NR	Epilepsy	No
Litchfield et al.	21	Male	NR	NR	Diabetes	NR
Madi et al.	42	Male	NR	NR	NR	NR
Maffulli et al.	31	Male	Caucasian	NR	None	NR
Manoharan et al.	46	Male	NR	NR	None	NR
Martin et al.	30	Male	Caucasian	NR	None	NR
Martínez et al.	36	Male	NR	NR	NR	NR
McFie	31	Female	NR	NR	NR	No
Meena et al.	24	Male	NR	NR	None	No
Mehta et al.	53	Male	NR	NR	NR	NR
Mofidi et al.	30	Male	NR	NR	Epilepsy	Yes
Nagi et al.	49	Male	NR	NR	Hypertension	Yes
Ng et al.	70	Female	NR	NR	None	No
Ngim et al.	65	Female	NR	NR	None	No
Nourredine et al.	70	Male	NR	NR	Osteoarthritis	NR
O'Connor-Read et al.	25	Male	NR	NR	Undiagnosed Seizure Disorder	NR
Özçelik et al.	20	Male	NR	NR	Diabetes	Yes

Table S2. Continued

Park et al.	23	Male	NR	NR	None	NR
Poggetti et al.	28	Male	NR	NR	None	NR
Porecha et al.	20	Male	NR	NR	Undiagnosed Seizure Disorder	NR
Raptis et al.	41	Female	NR	32.1	Epilepsy	NR
Rouhani et al.	37	Male	NR	NR	Undiagnosed Seizure Disorder	No
Rudy et al.	16	Female	NR	NR	Undiagnosed Seizure Disorder	NR
Sachit et al.	29	Female	NR	NR	Undiagnosed Seizure Disorder	NR
Salem	37	Male	NR	NR	NR	NR
Schneider et al.	67	Male	NR	26.6	None	NR
Segal et al.	60	Male	NR	NR	Epilepsy	Yes
	32	Male	NR	NR	Epilepsy	NR
	19	Male	NR	NR	NR	NR
Sharma et al.	42	Male	NR	NR	None	No
Shetty et al.	36	Male	NR	NR	NR	NR
Silva et al.	82	Female	NR	NR	None	NR
Singh et al.	21	Male	NR	NR	NR	Yes
Siu et al.	75	Female	NR	NR	None	NR
Siwach et al.	45	Male	NR	NR	None	No
Sunku et al.	30	Male	NR	NR	Undiagnosed Seizure Disorder	NR
Suryavanshi et al.	45	Male	NR	NR	Undiagnosed Seizure Disorder	NR
Taneja et al.	37	Female	NR	NR	Undiagnosed Seizure Disorder	NR
Thakur et al.	35	Male	NR	NR	NR	NR
Thomas et al.	65	Female	NR	NR	NR	NR
Tripathy et al.	50	Male	NR	NR	NR	NR
	32	Male	NR	NR	NR	NR
Turhan	32	Male	NR	NR	Epilepsy	NR
Upasani et al.	35	Male	NR	NR	Undiagnosed Seizure Disorder	No
Velkes et al.	70	Female	NR	NR	None	NR
Wheeldon et al.	32	Male	NR	NR	Undiagnosed Seizure Disorder	NR
Yuen et al.	41	Male	NR	NR	NR	NR
Zoofaghari et al.	33	Male	NR	NR	Depression/Suicidality	NR

BMI = body mass index; COPD = chronic obstructive pulmonary disease; NR= not reported; TIA = transient ischemic attack; TMJ = temporomandibular joint;

Table S3. BASD Event Information

Authors	Mechanism	Witnessed	Other Injuries ^a	Time From Injury to Presentation ^b
Abdulkadir et al.	Seizure	NR	None	Delayed (2 years)
Agrahari et al.	Fall	NR	Facial Laceration	Immediate
Ahmad et al.	Seizure	NR	None	Delayed (9 months)
Antri et al.	Push Forward (Rising from Floor)	NR	None	Immediate
Auerbach et al.	Fall	Yes	None	Delayed (1 day - missed 1 side)
Ballesteros et al.	Fall	NR	None	Immediate
	Push Forward (Shoving)	Yes	None	Immediate
Bellazzini et al.	Unknown	No	None	Immediate
Bremner et al.	Seizure	Yes	None	Delayed (2 days)
Chamseddine et al.	Seizure	NR	None	Delayed (6 weeks)
Chen et al.	Manipulation	Yes	None	Delayed (1 day)
Chen et al.	Manipulation	Yes	None	Immediate
Choulapalle et al.	Manipulation	Yes	None	Delayed (6 weeks)

Table S3. Continued

Costigan et al.	Unknown	NR	None	Delayed (Unknown)
Cottias et al.	Seizure	NR	None	Immediate
Cresswell et al.	Push Forward (Bench-Press)	NR	None	Immediate
Deshpande et al.	Fall	NR	None	Immediate
Devalia et al.	Fall	NR	None	Immediate
Diallo et al.	Seizure + Fall	NR	None	Immediate
	Seizure	NR	None	Delayed (2 years)
Dinopoulos et al.	Fall	NR	None	Immediate
Dimi et al.	Fall	NR	None	Immediate
	Push Forward (Backstroke)	NR	None	Immediate
Dodds et al.	Seizure	NR	None	Delayed (2 months)
Dunlop et al.	Fall	NR	None	Immediate
El Rassi et al.	Push Forward (Bench-Press)	NR	None	Delayed (1 year)
Esenkaya et al.	Push Upwards (Military Press)	Yes	None	Immediate
Felderman et al.	Chin-Up Exercise	NR	None	Immediate
Gopinath et al.	Seizure + Fall	NR	None	Delayed (4 months)
Hartney-Velazco et al.	Seizure/Convulsion	Yes	None	Delayed (1 week)
Jones, M.	Push Forward (Bench-Press)	Yes	None	Immediate
Joseph et al.	Seizure	Yes	None	Immediate
Kakhki et al.	Seizure	Yes	None	Immediate
Kalkan et al.	Hanging onto Bar	NR	None	Immediate
	Hanging onto Bar	NR	None	Immediate
Karaman et al.	Unknown	NR	None	Immediate
Kovilazhikathu Sugathan et al.	Suspected Fall	NR	Scalp Laceration	Delayed (1 month)
Kubiak et al.	Electrocution + Push Forward	NR	None	Delayed (1 month)
Kumar et al.	Fall	NR	None	Immediate
Lasanianos et al.	Seizure	NR	None	Delayed (3 weeks)
Litchfield et al.	Seizure	NR	None	Delayed (1 day)
Madi et al.	MVC	Yes	None	Immediate
Maffulli et al.	Weight Lifting (Pull-Over)	NR	None	Immediate
Manoharan et al.	Digging	NR	None	Immediate
Martin et al.	Seizure	Yes	None	Immediate
Martínez et al.	Electrocution	NR	None	Immediate
McFie	Motorcycle Pulling Arms	NR	None	Delayed (Unknown)
Meena et al.	Fall	NR	None	Immediate
Mehta et al.	Fall	NR	Sternal fracture	Immediate
Mofidi et al.	Seizure	NR	TMJ Dislocation	Immediate
Nagi et al.	Fall	Yes	None	Immediate
Ng et al.	Fall	Yes	None	Immediate
Ngim et al.	Domestic Violence	Yes	None	Immediate
Nourredine et al.	Fall	NR	None	Immediate
O'Connor-Read et al.	Seizure	NR	Nasal Laceration	Immediate
Özçelik et al.	Seizure	NR	None	Immediate
Park et al.	Snowboarding Fall	NR	None	Immediate
Poggetti et al.	Unknown	NR	None	Delayed (3 months)
Porecha et al.	Seizure	Yes	None	Immediate

Table S3. Continued

Raptis et al.	Seizure	NR	None	Delayed (4 weeks)
Rouhani et al.	Suspected Seizure	NR	None	Delayed (13 days)
Rudy et al.	Seizure	Yes	None	Immediate
Sachit et al.	Seizure	NR	None	Immediate
Salem	Electrocution	Yes	None	Delayed (9 weeks)
Schneider et al.	Skiing Fall	NR	None	Immediate
Segal et al.	Seizure	NR	None	Immediate
	Seizure + Fall	NR	None	Immediate
	Waterskiing Fall	Yes	None	Immediate
Sharma et al.	Object Fallen on Back	NR	None	Delayed (2 weeks)
Shetty et al.	Hanging onto Bar	NR	None	Delayed (13 days)
Silva et al.	Fall	NR	None	Immediate
Singh et al.	Motorcycle Crash	Yes	None	Immediate
Siu et al.	Fall Forward (Push-Up)	NR	Forehead Hematoma	Immediate
Siwach et al.	Backward Traction Farm Injury	NR	None	Immediate
Sunku et al.	Seizure + Fall	NR	None	Delayed (20 days)
Suryavanshi et al.	Seizure + Fall	NR	None	Immediate
Taneja et al.	Seizure	NR	None	Immediate
Thakur et al.	Bracing During Fall	NR	None	Immediate
Thomas et al.	Fall	NR	None	Delayed (8 months)
Tripathy et al.	Motorcycle Crash	NR	Facial Injury	Immediate
	Seizure	NR	None	Immediate
Turhan	Bucked off Horse	NR	None	Immediate
Upasani et al.	Seizure	NR	None	Delayed (30 days)
Velkes et al.	Fall	NR	None	Immediate
Wheeldon et al.	Seizure	NR	None	Immediate
Yuen et al.	Electrocution	Yes	None	Immediate
Zoofaghari et al.	Overdose + Seizure	NR	None	Immediate

NR= not reported; MVC = motor vehicle crash;

^aNone unless reported^bImmediate unless explicitly reported as delayed

Table S4. BASD Injury Characteristics

Authors	Initial XR/CT	Right Injury Pattern	Right Classification	Left Injury Pattern	Left Classification	Right NV Injury	Left NV Injury
Abdulkadir et al.	XR	Dislocation	N/A	Dislocation	N/A	Unspecified BP	Unspecified BP
Agrahari et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Ahmad et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Antri et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Auerbach et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Ballesteros et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
	XR	Dislocation	N/A	Dislocation	N/A	No	No
Bellazzini et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Bremner et al.	XR/CT	Fracture-Dislocation	GT	Fracture-Dislocation	GT	No	No
Chamseddine et al.	XR/CT	Fracture-Dislocation	Coracoid	Fracture Dislocation	Coracoid	No	No

Table S4. Continued

Chen et al.	XR	Dislocation	N/A	Dislocation	N/A	Ax N. Paresthesias	Ax. N. Paresthesias
Chen et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Choulapalle et al.	XR/CT	Dislocation	N/A	Dislocation	N/A	No	No
Costigan et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Cottias et al.	XR/CT	Fracture- Dislocation	GT, Coracoid	Fracture- Dislocation	GT, Coracoid	No	No
Cresswell et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Deshpande et al.	XR/CT	Fracture- Dislocation	Anatomical Neck	Fracture- Dislocation	GT	No	Ax N. Paresthesias
Devalia et al.	XR	Fracture- Dislocation	GT	Dislocation	N/A	Ax N. Paresthesias	No
Diallo et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
	XR/CT	Dislocation	N/A	Dislocation	N/A	No	No
Dinopoulos et al.	XR	Fracture- Dislocation	GT, Surgical Neck	Dislocation	N/A	No	No
Dlimi et al.	XR	Fracture- Dislocation	GT	Fracture- Dislocation	GT	No	No
	XR	Dislocation	N/A	Dislocation	N/A	No	No
Dodds et al.	XR/CT	Fracture- Dislocation	GT	Fracture- Dislocation	GT	No	No
Dunlop et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
El Rassi et al.	XR/CT	Dislocation	N/A	Dislocation	N/A	No	No
Esenkaya et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Felderman et al.	XR	Dislocation	N/A	Dislocation	N/A	Generalized Paresthesias	Generalized Paresthesias
Gopinath et al.	XR/CT	Fracture- Dislocation	GT	Fracture- Dislocation	GT	No	No
Hartney-Velazco et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Jones, M.	XR	Dislocation	N/A	Dislocation	N/A	Ax N. paresthesias	Ax N. paresthesias
Joseph et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Kakhki et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Kalkan et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
	XR	Dislocation	N/A	Dislocation	N/A	No	Lower Posterior Cord Injury
Karaman et al.	XR/CT	Dislocation	N/A	Dislocation	N/A	No	No
Kovilzhikathu Sugathan et al.	XR/CT	Dislocation	N/A	Dislocation	N/A	No	No
Kubiak et al.	XR	Fracture- Dislocation	GT	Fracture- Dislocation	GT	No	No
Kumar et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Lasanianos et al.	XR	Dislocation	N/A	Fracture- Dislocation	GT	No	No
Litchfield et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No

Table S4. Continued

Madi et al.	XR/CT	Fracture-Dislocation	GT	Fracture-Dislocation	GT	No	No
Maffulli et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Manoharan et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Martin et al.	XR	Fracture-Dislocation	GT	Dislocation	N/A	No	No
Martínez et al.	XR	Fracture-Dislocation	GT	Dislocation	N/A	No	No
McFie	XR	Dislocation	N/A	Dislocation	N/A	No	No
Meena et al.	XR	Dislocation	N/A	Fracture-Dislocation	GT	No	No
Mehta et al.	XR	Dislocation	N/A	Dislocation	N/A	Unspecified BP	Unspecified BP
Mofidi et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Nagi et al.	XR/CT	Fracture-Dislocation	GT	Fracture-Dislocation	GT, LT, Surgical Neck	No	No
Ng et al.	XR	Fracture-Dislocation	GT	Dislocation	N/A	No	No
Ngim et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Nourredine et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
O'Connor-Read et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Özçelik et al.	XR	Dislocation	N/A	Fracture-Dislocation	GT	No	No
Park et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Poggetti et al.	XR/CT	Dislocation	N/A	Dislocation	N/A	Ax N. Paresthesias	Ax N. Paresthesias
Porecha et al.	XR	Fracture-Dislocation	GT, Surgical Neck	Fracture-Dislocation	GT, Surgical Neck	No	No
Raptis et al.	XR/CT	Fracture-Dislocation	GT	Fracture-Dislocation	GT	Ulnar antebrachium paresthesias	No
Rouhani et al.	XR/CT	Dislocation	N/A	Dislocation	N/A	No	No
Rudy et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Sachit et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Salem	XR	Fracture-Dislocation	Unspecified	Fracture-Dislocation	Unspecified	Ulnar N. Paresthesias	Ulnar N. Paresthesias
Schneider et al.	XR	Dislocation	N/A	Fracture-Dislocation	GT, LT, Surgical Neck	No	No
Segal et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
	XR	Fracture-Dislocation	GT	Fracture-Dislocation	GT	No	No
	XR	Dislocation	N/A	Dislocation	N/A	No	No
Sharma et al.	XR/CT	Fracture-Dislocation	GT, Surgical Neck	Fracture Dislocation	GT, Surgical Neck	No	No
Shetty et al.	XR	Fracture-Dislocation	GT	Fracture-Dislocation	GT	No	No
Silva et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Singh et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Siu et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No

Table S4. Continued

Siwach et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Sunku et al.	XR	Fracture- Dislocation	GT, LT, Surgical Neck	Fracture- Dislocation	GT	No	No
Suryavanshi et al.	XR	Fracture- Dislocation	GT	Fracture- Dislocation	GT	No	No
Taneja et al.	XR/MRI	Fracture- Dislocation	Coracoid	Fracture- Dislocation	Coracoid	No	No
Thakur et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Thomas et al.	XR	Fracture- Dislocation	GT	Fracture- Dislocation	N/A	Ax N. Palsy, Median N. Palsy	Ax N. Palsy
Tripathy et al.	XR	Fracture- Dislocation	GT	Fracture- Dislocation	GT	No	No
	XR	Dislocation	N/A	Dislocation	N/A	No	No
Turhan	XR	Dislocation	N/A	Dislocation	N/A	No	No
Upasani et al.	XR	Fracture- Dislocation	GT	Fracture- Dislocation	GT	No	No
Velkes et al.	XR	Fracture- Dislocation	GT	Dislocation	N/A	No	No
Wheeldon et al.	XR	Dislocation	N/A	Dislocation	N/A	No	No
Yuen et al.	XR	Dislocation	N/A	Fracture- Dislocation	GT	No	No
Zoofaghari et al.	XR	Fracture- Dislocation	Unspecified	Dislocation	N/A	No	No

Ax N. = axillary nerve; BP = brachial plexus; CT = computed tomography; GT = greater tuberosity; LT = lesser tuberosity; Ulnar N. = ulnar nerve; XR = x-ray;

**Exclude Hills-Sachs/Bankart

Table S5. BASD Management and Outcomes

Authors	Right Closed Reduction Attempt	Right Shoulder Procedure	Left Closed Reduction Attempt	Left Shoulder Procedure	Length of Follow-up	PROM	Reported Improvement	Recurrence/ Complications
Abdulkadir et al.	Not Attempted	N/A	Not Attempted	N/A	N/A	No	N/A	N/A
Agrahari et al.	Successful	N/A	Successful	N/A	8 weeks	Yes	Yes	No
Ahmad et al.	Not Attempted	OR	Not Attempted	OR	5 months	No	Yes	No
Antri et al.	Successful	Latarjet	Successful	N/A	6 months	No	Yes	R Recurrent Subluxation
Auerbach et al.	Successful	N/A	Successful	N/A	N/A	No	Yes	R Recurrent Dislocation
Ballesteros et al.	Successful	N/A	Successful	N/A	2 years	No	Yes	No
	Successful	N/A	Successful	N/A	3 months	No	Yes	No
Bellazzini et al.	Successful	N/A	Successful	N/A	None	No	N/A	N/A
Bremner et al.	Successful	N/A	Successful	ORIF (osteochondral allograft) w/ RCR, Arthroscopic subacromial bursectomy, HW removal	18 months	No	Yes	L Recurrent Dislocation, L symptomatic HW/impingement post-op
Chamseddine et al.	Unsuccessful	ORIF LT, Latarjet, GH transfixation	Unsuccessful	ORIF LT, Latarjet, GH transfixation	11 months	No	No	No
Chen et al.	Successful	N/A	Successful	N/A	6 months	No	Yes	No

Table S5.Continued

Chen et al.	Successful	N/A	Successful	N/A	1 year	Yes	Yes	No
Choulapalle et al.	N/A	N/A	Not Attempted	OR, GH transfixation	N/A	No	N/A	N/A
Costigan et al.	Not Attempted	N/A	Not Attempted	N/A	N/A	No	N/A	N/A
Cottias et al.	Unsuccessful	ORIF GT, Latarjet	Successful	N/A	7 months	No	Yes	No
Cresswell et al.	Successful	N/A	Successful	N/A	N/A	No	Yes	No
Deshpande et al.	Successful	CRPF (GT)	Unsuccessful	ORIF (Neck), AH transfixation	N/A	No	N/A	N/A
Devalia et al.	Successful	N/A	Successful	N/A	12 weeks	No	Yes	No
Diallo et al.	Successful	N/A	Successful	N/A	35 months	Yes	Yes	No
	Not Attempted	N/A	Not Attempted	N/A	N/A	Yes	N/A	N/A
Dinopoulos et al.	Successful	N/A	Successful	N/A	12 weeks	No	Yes	No
Dlimi et al.	Successful	N/A	Successful	N/A	1 year	No	Yes	No
	Successful	N/A	Successful	N/A	1 year	No	Yes	No
Dodds et al.	Not Attempted	ORIF GT	Not Attempted	ORIF GT	8 months	No	Yes	AVN R humeral head
Dunlop et al.	Successful	N/A	Successful	N/A	N/A	No	Yes	No
El Rassi et al.	Unsuccessful	N/A	Unsuccessful	N/A	N/A	No	N/A	N/A
Esenkaya et al.	Successful	N/A	Successful	N/A	5 years	No	Yes	No
Felderman et al.	Successful	N/A	Successful	N/A	2 months	No	Yes	No
Gopinath et al.	Not Attempted	OR, GH transfixation	Not Attempted	OR, Modified Boytchev, GH transfixation	6 months	No	Yes	No
Hartney-Velazco et al.	Successful	N/A	Successful	N/A	6 weeks	No	Yes	No
Jones, M.	Successful	N/A	Successful	N/A	9 weeks	No	Yes	No
Joseph et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Kakhki et al.	Successful	N/A	Successful	N/A	4 weeks	No	Yes	No
Kalkan et al.	Successful	N/A	Successful	N/A	1.5 years	No	Yes	No
	Successful	N/A	Successful	N/A	1.5 years	No	Yes	No
Karaman et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Kovilazhikathu Sugathan et al.	Not Attempted	N/A	Not Attempted	RTSA	6 months	No	Yes	No
Kubiak et al.	Unsuccessful	ORIF (GT)	Unsuccessful	ORIF (GT)	2 years	Yes	Yes	No
Kumar et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Lasanianos et al.	Successful	N/A	Successful	N/A	2 years	No	Yes	No
Litchfield et al.	Successful	N/A	Successful	N/A	2 months	No	Yes	No
Madi et al.	Successful	ORIF (GT)	Successful	ORIF (GT)	6 months	Yes	Yes	No
Maffulli et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Manoharan et al.	Successful	Soft Tissue Stabilization	Successful	Soft Tissue Stabilization	6 months	No	Yes	No
Martin et al.	Successful	N/A	Successful	N/A	12 months	Yes	Yes	No
Martínez et al.	Successful	N/A	Successful	N/A	4 months	No	Yes	No
McFie	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Meena et al.	Successful	N/A	Successful	N/A	1 year	No	Yes	No
Mehta et al.	Successful	N/A	Successful	N/A	4 months	No	Yes	No

Table S5. Continued

Mofidi et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Nagi et al.	Unsuccessful	ORIF (GT), GH and AH transfixation	Not Attempted	HA	3 months	No	Yes	No
Ng et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Ngim et al.	Successful	N/A	Successful	N/A	3 weeks	No	N/A	N/A
Nourredine et al.	Successful	N/A	Successful	N/A	4 weeks	Yes	Yes	No
O'Connor-Read et al.	Successful	N/A	Successful	N/A	4 weeks	No	Yes	No
Özçelik et al.	Successful	N/A	Successful	N/A	3 years	No	Yes	No
Park et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Poggetti et al.	Not Attempted	Bristow-Latarjet	Not Attempted	Bristow- Latarjet	1 year	Yes	Yes	No
Porecha et al.	Not Attempted	ORIF (GT)	Not Attempted	ORIF (GT)	1 year	No	Yes	No
Raptis et al.	Successful	N/A	Successful	N/A	1 year	Yes	Yes	No
Rouhani et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Rudy et al.	Successful	N/A	Successful	N/A	4 days	No	Yes	No
Sachit et al.	Successful	N/A	Successful	N/A	8 weeks	No	Yes	No
Salem	Not Attempted	OR	Not Attempted	OR	10 years	No	Yes	No
Schneider et al.	Successful	RCR, BT	Successful	ORIF (GT), Allograft	2 years	No	Yes	No
Segal et al.	Successful	N/A	Successful	N/A	6 months	No	Yes	No
Segal et al.	Successful Successful	N/A Putti-Platt	Successful Successful	N/A Putti-Platt	14 months N/A	No No	Yes N/A	No Recurrent BASD
Sharma et al.	Not Attempted	ORPF, RCR	Not Attempted	ORPF	1 year	No	Yes	No
Shetty et al.	Successful	ORIF (GT), HW Removal	Successful	ORIF (GT), HW Removal	36 weeks	No	Yes	L>R Malunion
Silva et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Singh et al.	Successful	N/A	Successful	N/A	1 year	No	Yes	No
Siu et al.	Successful	N/A	Successful	N/A	6 weeks	No	Yes	L Posterior Cord Traction Injury, R Recurrent Dislocation
Siwach et al.	Successful	N/A	Successful	N/A	3 years	No	Yes	No
Sunku et al.	Unsuccessful	ORIF, PF, RCR	Unsuccessful	ORPF, RCR	1 year	No	Yes	No
Suryavanshi et al.	Successful	N/A	Successful	N/A	1 year	No	Yes	No
Taneja et al.	Successful	N/A	Successful	N/A	6 months	No	Yes	No
Thakur et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Thomas et al.	Not Attempted	HA	Not Attempted	HA	6 months	No	Yes	No
Tripathy et al.	Successful Successful	N/A N/A	Successful Successful	N/A N/A	2 years 3 months	No No	Yes Yes	No No
Turhan	Successful	N/A	Successful	N/A	6 weeks	No	Yes	No
Upasani et al.	Unsuccessful	ORIF (GT)	Successful	N/A	3 months	No	Yes	No
Velkes et al.	Successful	N/A	Successful	N/A	1 year	No	Yes	No
Wheeldon et al.	Successful	N/A	Successful	N/A	N/A	No	N/A	N/A
Yuen et al.	Successful	N/A	Successful	N/A	3 months	No	Yes	No
Zoofaghari et al.	Successful	"Fixed"	Successful	N/A	N/A	No	N/A	N/A

AH = acromioclavicular; AVN = avascular necrosis; BT = biceps tenodesis/tenotomy; GH = glenohumeral; GT = greater tuberosity; HW = hardware; IF = internal fixation; LT = lesser tuberosity; OR = open reduction; PF = percutaneous fixation; PROM = patient reported outcome measures; RCR = rotator cuff repair