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Hand dominance in traumatic shoulder dislocations

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Background: Shoulder dislocations are common injuries among athletes. Patients with instability after their injury often require stabilization procedures for treatment. The primary outcome measure was to see whether there was any correlation between the side of traumatic shoulder dislocation and dominance of hand. Secondary outcomes were to look at subgroups of age and sporting discipline.

Materials and methods: This study recruited all patients with a frank dislocation that required arthroscopic surgical stabilization who attended the same private orthopedic surgeon. Exclusion criteria included injury without frank dislocation, nonsport-related injuries, and ambidexterity. Data were collected for 325 of 365 patients (89.0% response rate)

Results: There were 278 right hand-dominant patients (85.5%), with 136 (48.9%) requiring arthroscopic stabilization of their dominant side for dislocation. Of the remaining 47 left hand-dominant patients, 17 (36.2%) required operations on their dominant arm. In total, 153 patients (47.1%) dislocated their dominant shoulder and 172 (52.9%) dislocated their nondominant shoulder, with an odds ratio of 1.692 (95% confidence interval, 0.893–3.205).

Conclusions: This study suggests that there is no statistical significance between the side of shoulder dislocation and hand dominance of patients with shoulder dislocation. Future research could investigate further the causal relationship between hand dominance and mechanisms of injury.

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The glenohumeral joint (shoulder) is the most commonly dislocated joint in the human body, with a 1% to 2% lifetime prevalence in the general population and 7% in athletes.^{6,8,12} Previous studies have shown that the incidence of shoulder dislocation can range from 11.2 to 23.9 per 100,000.^{3,14,19} The highest risk population are young men aged 16 to 30 years and elderly women aged between 60 and 80.^{4,6,8}

The most common cause for dislocation is by violent or accidental trauma, which is commonly seen in contact sports.^{5,18,19} In rugby, 80% of shoulder injuries were dislocations and an Australian Rules Football League injury report showed that rates of shoulder injuries have been increasing, with the incidence rates nearly doubling (from 1.0 to 1.8) during an 11-year period (1997–2008).^{11,15}

Complications resulting from acute shoulder dislocations have been reported in up to 55% of cases, with the most common of these being fracture and neurologic damage.^{1,6,16} There is a 10% to 15% risk

of rotator cuff tears occurring in people aged <30 years,^{1,4,6} and younger patients (<20 years) have been estimated to have recurrent dislocation rates of up to 95%.^{2,4,10}

Previous studies have documented hand dominance as an incidental finding in the evaluation of the population, but none have formally evaluated the significance of the rates of traumatic shoulder dislocation with dominance of hand.^{8,17} This study aimed to bridge the gap in the literature and provide additional information about shoulder dislocations, dominance of hand, and the significance of the sport discipline played, driving additional research into sporting-related shoulder dislocations. Ultimately, this study has the potential to influence the future training techniques in contact sports to prevent shoulder injury and ongoing complications.

Materials and methods

Inclusion criteria for this retrospective study included a first episode of traumatic shoulder dislocation with ongoing instability that required arthroscopic surgical repair (shoulder arthroscopic stabilization for recurrent instability including labral repair or reattachment, Medicare Benefits Schedule in Australia) conducted by 1 surgeon at a private orthopedic practice. We identified 1012 patients between January 2002 and January 2012. Patients were

The St John of God Hospital Subiaco Ethics Review Board granted ethics approval in April 2012.

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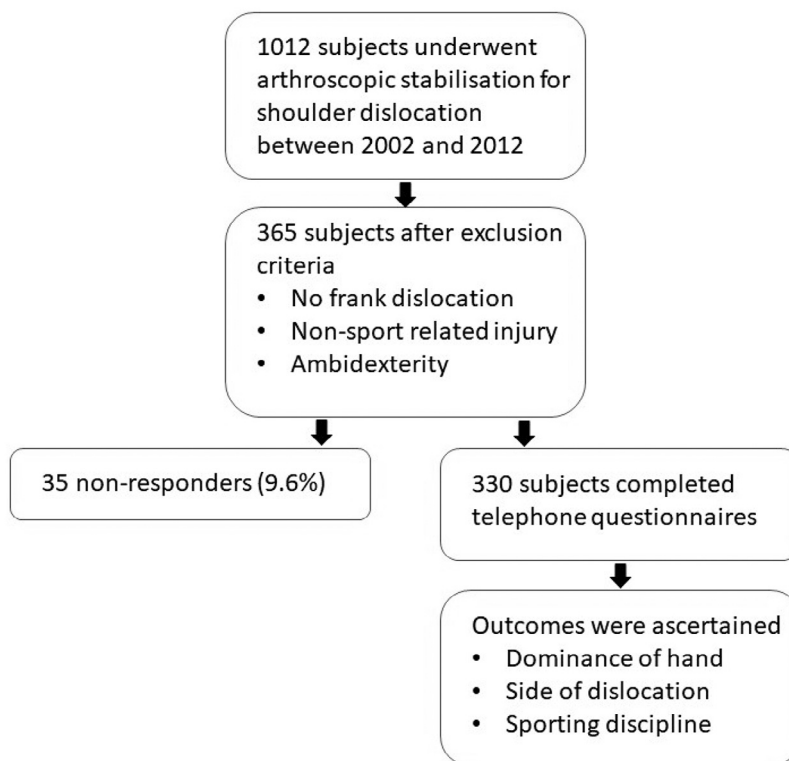


Figure 1 Methodology for the recruitment of patients.

excluded if they sustained their injury without a frank dislocation, (2) did not experience sporting-related injuries, or (3) identified as ambidextrous. Nine patients were excluded because of ambidexterity, which was defined as use of both the left and right arms regularly for common activities of daily living (ie, writing, using a computer mouse, throwing, catching). The most common example being individuals who write left handed but throw a ball right handed. A diagram of the methodology can be seen in Fig. 1.

Item number 48957 on the Medicare Benefits Schedule involves an arthroscopic surgical stabilization of the shoulder for recurrent instability with, or without labral repair. The technique initially involved mobilization of the labrum from the glenoid neck. This was followed by preparation of glenoid neck to bleeding bone. The arthroscopic stabilization was done with bioabsorbable anchors and involved 3 anchors with 1 arthroscopic knot per anchor. The anchors were placed at the 5 o'clock, 4 o'clock, and 3 o'clock positions. A single limb was passed through the soft tissue, followed by arthroscopic knots (Weston knot) with 3 half-hitches alternating the post.

Parameters of age, type of dislocation (anterior/posterior), side of dislocation, hand dominance, and sport discipline at time of injury were recorded. The primary outcome measure was the side of traumatic shoulder dislocation with respect to the dominance of hand of the patient, which was subjectively defined by the patient. Secondary outcome measures included sporting discipline. A further analysis grouped the data by age younger or older than 22 years. We chose this age because a previous study showed that patients younger than 22 were at higher risk of repeat dislocation.⁹

All statistical analyses were performed using SPSS software (IBM Australia Ltd, St Leonards, NSW, Australia). We used χ^2 testing to assess whether there was a significant difference in the frequency of nondominant compared with dominant shoulder dislocations. An odds ratio was calculated to determine the risk of dislocating the nondominant shoulder compared with the dominant shoulder.

The P value of $<.05$ was considered significant. All data were calculated to 3 significant figures.

Results

There were 365 patients eligible for the study, and data were collected on 325 (89.0% response rate). Patients were a mean age of 21.3 years (range, 10–55 years). There were 279 male (85.8%) and 46 female (14.2%) patients. The dislocation was anterior in 302 patients (92.9%).

There were 278 right-hand dominant patients (85.5%), with 136 (48.9%) requiring arthroscopic stabilization of their dominant side for dislocation. Of the remaining 47 left hand-dominant patients, 17 (36.2%) required operations on their dominant arm. The dominant shoulder was dislocated in 153 patients (47.1%) and the nondominant shoulder in 172 (52.9%), with an odds ratio of 1.692 (95% confidence interval, 0.893–3.205). Results of χ^2 testing are reported in Table 1.

Table 1

Results of χ^2 tests and the odds ratio for dominance of hand against side of shoulder dislocation

Tests	Value	df	Significance		
			Asymp (2-sided)	Exact (2-sided)	Exact (1-sided)
Pearson χ^2	2.641*	1	0.104		
Fisher's exact test [†]				0.116	0.071
Valid cases, No.	331				
Odds ratio (95% CI)	1.692 [‡] (0.893–3.205)				

CI, confidence interval.

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 22.15.

[†] Computed only for a 2×2 table.

[‡] Binomial distribution used.

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