

The shoulder in the collision athlete

Khalid Mohammed

Angela Cadogan

Deborah Robinson

John Roche

Abstract

“Collision athletes” participate in sports and activities that involve regular impact with opponents. In our community in New Zealand, the most common “collision” sports are rugby union and rugby league. Combat sports such as boxing and martial arts are also collision sports. Injuries are common in the collision athlete, especially shoulder injuries. There are many different injury mechanisms and patterns of shoulder injury that arise from collision impact. As power and muscle mass are an advantage in collision sports, these athletes often participate in heavy weight-training and may sustain shoulder injuries related to sport-specific conditioning. There are many factors to consider in the management of shoulder injuries in the collision athlete. The short-term and long-term effects of injury and treatment options, season and career timing, non-operative and operative treatments must all be considered. Player safety should be paramount. With good treatment, the expectation of most elite athletes with collision shoulder injuries is that they will return to their sport. Athletes nearing retirement and recreational collision athletes may prefer to minimise re-injury risk by retiring from collision sports, even after successful treatment. The preventative strategies and long-term consequences of collision shoulder injuries have not been defined.

Keywords athletic injuries; physical examination; shoulder; shoulder dislocation; surgery

Epidemiology of shoulder injuries in the collision athlete

Collision shoulder injuries may occur during competition or during training and result in significant disruption to the career of a professional athlete. A recent report concerning professional rugby players found that shoulder injuries were the most common reason for retirement due to injury in the previous 10 year

Khalid Mohammed *MBChB FRACS Consultant Orthopaedic and Upper Limb Surgeon, Department of Orthopaedic Surgery and Musculoskeletal Medicine, University of Otago School of Medicine, Christchurch Hospital, Christchurch, New Zealand. Competing interests: none declared.*

Angela Cadogan *NZRPSPH.D M.Sports Physio Dip MT Dip Phys Research Assistant, Physiotherapy Specialist, Elmwood Orthopaedics, Christchurch, New Zealand. Competing interests: none declared.*

Deborah Robinson *BSc MBChB FACSP Sports Physician, Sportsmed, Christchurch, New Zealand. Competing interests: none declared.*

John Roche *PGDip Hlth Sci (Manip Phys) Dip Phys Lead Physiotherapist Crusaders and Canterbury Rugby, Sports Physiotherapist, Christchurch, New Zealand. Competing interests: none declared.*

period, accounting for 8 of 33 (24%) retirements (first equal with cervical spine injuries).¹ In professional English rugby union players the shoulder is reported to be the 2nd most common injury site for backs and the 5th most common for forwards.² Injuries include acromioclavicular (AC) joint injuries and glenohumeral instability patterns, including traumatic dislocations and rotator cuff injuries. Glenohumeral dislocations are the second most common cause of lost days from sport in rugby union backs and 3rd most common for forwards.

Recent injury surveillance data from the England Rugby Premiership indicated that one third of all injuries for the 2011–2012 season occurred during training.³ For shoulder injuries sustained in training, the AC joint is reported to be the most commonly injured region in the shoulder and glenohumeral dislocations are the main cause of lost playing days resulting from shoulder injuries.^{1,3} The most common situation in which shoulder training injuries occur is when practicing defence drills. As defence becomes an increasingly important part of rugby, and specialist coaches become involved, there is more contact in training, increasing the risk of collision injuries. **Table 1** summarises the key points from the literature on rugby shoulder injuries, regarding match and training injuries, player position variations, the mechanisms, nature and severity of injuries.

We surveyed a professional New Zealand provincial rugby team for shoulder injuries. This team included entry-level professional rugby players and players who also play at international level. 24 players (48 shoulders) completed Oxford Instability Scores. 80% of the players had already had surgery for injuries sustained playing rugby, and more than half of the players (56%) had already had shoulder surgery for an injury sustained through rugby. Approximately 60% of the forwards and 40% of the backs had already had shoulder surgery for a rugby injury. Two thirds of the players recalled losing game time in their career as a result of shoulder injury. Shoulder surgery procedures included glenohumeral stabilisation, pectoralis major repair, AC joint surgery and arthroscopic debridement (**Figure 1**). The Oxford Instability Score has a maximum score of 48, representing a perfect (asymptomatic) score. In the team survey, the mean Oxford instability scores after the different types of shoulder procedures reported was more than 40/48 for most players. Players who had previously undergone a glenohumeral stabilization procedure had a mean score of 45/48. It should be noted however that numbers in different diagnostic groups was small. Interestingly, many players reported some symptoms in the shoulders that had not had surgery (**Figure 2**). An additional nine players were not available to participate in the study, with most of these players being away on international duties. Of these nine players at least seven had undergone previous surgery for rugby injuries, at least two had shoulder surgery and another was convalescing with non-operative treatment after recent shoulder injury.

In Rugby League there is a similar high prevalence of shoulder injuries in New Zealand. Injuries are registered and treated by the national injury insurer, the Accident Compensation Corporation (ACC). King et al. found that, according to ACC data, the shoulder was the second most frequent and third most costly injury in rugby league in New Zealand between 1999 and 2007.⁴ Of all rugby league related injury claims, 15% were soft tissue shoulder injuries and 21% were shoulder fractures or

Incidence, prevalence and nature of shoulder injuries in rugby union

	Match		Training	
	Backs	Forwards	Backs	Forwards
Incidence of shoulder injuries	Shoulder 2nd most common match injury in backs.		Shoulder 5th most common match injury in forwards.	
Most common shoulder Injuries	<ul style="list-style-type: none"> • AC joint • GHJ dislocation • Cuff/impingement 	<ul style="list-style-type: none"> • AC joint • GHJ dislocation • Cuff/impingement 	<ul style="list-style-type: none"> • AC joint • GHJ dislocation • Cuff/impingement 	<ul style="list-style-type: none"> • AC joint • GHJ dislocation • Cuff/impingement
Injury Severity (lost days)	<ul style="list-style-type: none"> • GHJ dislocation: <ul style="list-style-type: none"> ○ Most severe shoulder injury (time lost) ○ 2nd rank of all injuries • Cuff/impingement • AC joint 	<ul style="list-style-type: none"> • GHJ dislocation: <ul style="list-style-type: none"> ○ Most severe shoulder injury (time lost) ○ 3rd rank of all injuries • Cuff/impingement • AC joint 	<ul style="list-style-type: none"> • GHJ Dislocation 	
Mechanism	<ul style="list-style-type: none"> • “Try Scorer” (hyper-flexion) • “Tackler” (horizontal abduction) • Direct Blow (arm by side/in adduction) 		Defence drills	Ruck and maul/defence drills

Abbreviations: AC, acromioclavicular; GHJ, glenohumeral joint.
 (Brooks, Fuller, Kemp, & Reddin, 2005; J Crichton, D. R Jones, & L Funk, 2012; C. W Fuller, F Laborde, R. J Leather, & M. G Molloy, 2008).

Table 1

dislocations. The cost to the ACC for shoulder injuries during this period was NZD \$6,856,788.⁴ These costs include investigation, treatment and some earnings-related compensation.

Usman and McIntosh, conducted a prospective cohort study across five rugby seasons, involving 1475 adult male players in colts (younger age group), grade and elite competitions.⁵ They found a lower incidence of shoulder injuries in the elite players

compared to the colts and grade players. The shoulder injury incidence rate per 1000 athletic exposures was 3.57 in the elite group, 6.61 in the grades group and 7.14 in the colts group. Glenohumeral dislocations were more common in the elite group and AC joint injuries were more common in the colts and grade players. In elite and grade players the tackler was more

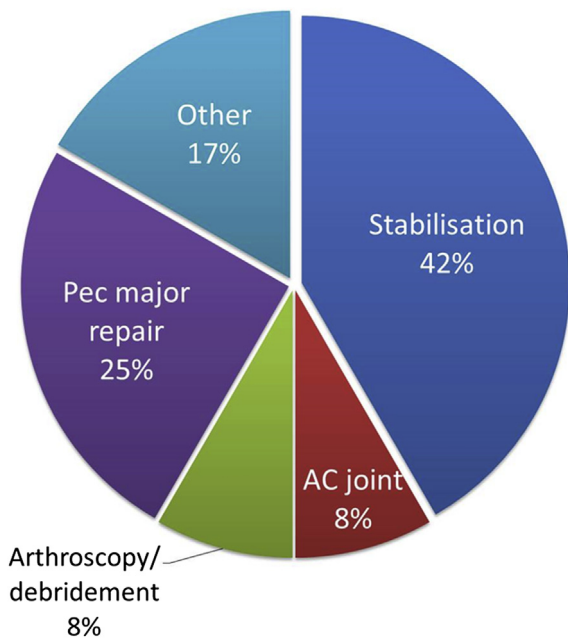


Figure 1 Previous shoulder surgery reported by players in a provincial rugby union team. (n = 12).

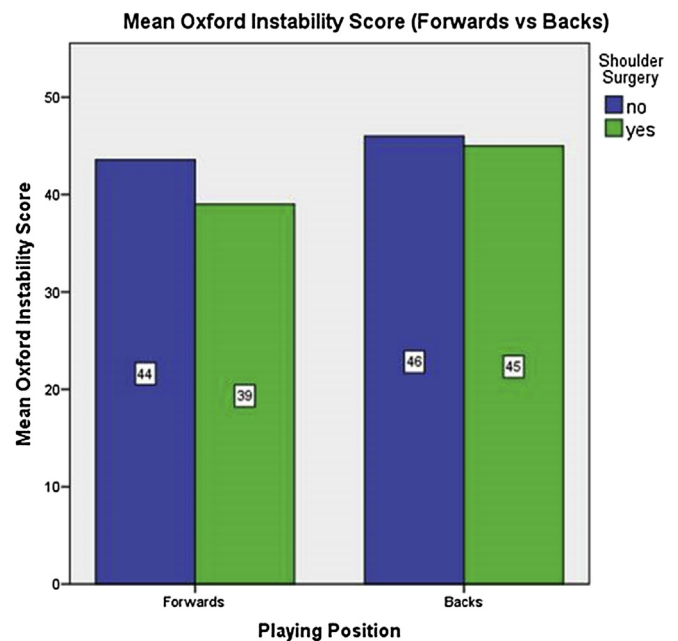


Figure 2 Mean Oxford Instability Scores among provincial rugby players. (n = 11).

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