P. J. Chapman

OROFACIAL INJURIES AND MOUTHGUARDS: A STUDY OF THE 1984 WALLABIES

P. J. CHAPMAN, MBBS, MDS (Oral Surgery)

*Maxillofacial Surgeon, University of Queensland Dental School, Brisbane 4000
Queensland, Australia*

ABSTRACT

As mouthguards provide protection of the teeth, jaws, adjacent soft tissues and also protect the brain against concussion following impacts to the mandible, the use of mouthguards in contact sports is strongly recommended. It is therefore essential to gauge regularly the use of mouthguards in the various contact sports at all levels of competition. Of the 30 members of the 1984 Australian Rugby Union Touring Team (the Wallabies), 80% wore mouthguards and of these, 75% believed that wearing mouthguards should be made compulsory for Rugby players. A comparison of these and other findings is made with previous studies in Rugby, and also with a similar study of the 1984 Great Britain Rugby League Touring Team.

INTRODUCTION

Mouthguards are regarded as being essential for protection of the orofacial region in all contact sports (Chapman, 1983; Walkden, 1981; Hughston, 1980). Generally mouthguards are either worn early in a sporting career, usually as a result of parental decision, or later often only after some type of injury has been sustained. A study of the incidence of orofacial injuries (which includes dental injury, intraoral and circum-oral lacerations and jaw fractures) and attitudes to the use of mouthguards of the 30 members of the 1984 Wallabies was undertaken to allow full analysis of the results and also a comparison with other published studies.

RESULTS

The average age of the players was 24.9 years, and 24 players (80%) wore mouthguards, all except one of which was a custom type. All 30 players believed that mouthguards provided protection to the teeth, jaws and adjacent soft tissues, and 75% of the wearers believed that wearing mouthguards should be made compulsory when playing Rugby. The average duration of playing Rugby was 13.7 years and the average age of starting regular competition was 11.2 years. The average age of commencement of wearing mouthguards was 13.1 years, approximately 2 years on average after commencing regular competition. However, 39.1% of mouthguard wearers actually started wearing a mouthguard when they first started playing Rugby. The maximum delay in starting to use a mouthguard was 10 years after first starting regular competition and this was following a fractured mandible. There were 10 instances of orofacial injury occurring, and in half of these instances mouthguards were not worn at that time: 4 cases required medical treatment (mainly suturing of lacerations) and 6 cases required dental treatment, including two instances of mandibular fractures. Of those not wearing a mouthguard at the time, 4 of the 5 then commenced wearing a mouthguard, while the remaining player tried unsuccessfully to use a non-custom type. Of the players who wore mouthguards, 37.5% would not play a game without their mouthguard, 58.3% would play without their mouthguard but only if absolutely required to, and only 4.2% would be willing to play without their mouthguard. All 6 non-wearers had been advised to wear a mouthguard at some stage of their career. One of these players had just started wearing a mouthguard while 4 others had tried unsuccessfully to wear a mouth-

guard, which in 3 cases was a non-custom type. The main complaints were difficulty with talking, breathing and uncomfortable fit.

DISCUSSION

Depending on the direction of the force, dental injuries can be caused either directly or indirectly. Direct dental trauma is caused by such means as, for example, a hockey stick, fist or elbow, etc. hitting the teeth, and can occur in both contact and non-contact sports. The teeth most liable to injury by direct trauma are the maxillary anteriors, being most prominent in position. The lip acts as a cushion to protect the teeth and lessens the force of the blow. This reduces the occurrence of tooth fracture. Indirect dental trauma is caused when force is applied to the mandible from below, which causes the jaws to be forcibly and violently closed. This is seen in contact sports when, for example, an uppercut blow is delivered to the mandible. However indirect dental trauma may also occur in non-contact sports if, for example, a player is struck accidentally on the mandible from below by the head of an opposing player. In such cases the lower teeth are forcibly closed onto the upper teeth, causing damage mainly to the posterior teeth of either jaw. Overall, if a mouthguard is not being worn, dental trauma would be much more common in sports because they provide protection against both direct and indirect trauma to roughly the same degree. Finally dental injuries can occur alone, or in conjunction with other injuries to the facial region e.g. fractured mandible, fractured nose, etc.

Injuries to the teeth can occur therefore in any sports and it has generally been believed that this was especially so in the contact sports. However, a recent report by Davis and Knott (1984) of 313 cases of dental injury showed that of the 33% which occurred during organised sports, only 32% occurred during contact sports. In the non-contact sports, the usual cause of injury was following impact with hard objects (e.g. cricket balls, hockey sticks, squash racquets, etc.), although a percentage of accidental impacts with other players also occurred. Davis and Knott found that only 5.9% of those who sustained dental injury were wearing a mouthguard at the time of injury. It is possible that the comparison with contact sports was biased, as mouthguards are well accepted in Australia, with reasonably high usage rate. This is reflected in

part by the results of this study. However the risk of injury in non-contact sports is still high and wider usage of mouthguards is recommended.

Hawke and Nicholas (1969) reported perhaps the first survey of orofacial injuries in Rugby and found that 61.8% of Rugby players had sustained orofacial injury which included 25.7% who had sustained dental injury. Only 7.2% of the players wore mouthguards as mouthguards were still being accepted in sports at that time. Hawke and Nicholas also found that about half of the dental injuries were accompanied by lacerations to the lips.

A custom type mouthguard, made on models of a player's teeth, can be made satisfactorily for virtually any individual. A person wearing a removable upper partial denture can be fitted with a suitable mouthguard, as can a person edentulous in the upper jaw but having lower natural teeth and also a person who is completely edentulous (Stevens, 1981; Chapman, 1985a). Removable dentures should never be worn during contact sports because of the risk of breakage of the denture with loose fragments in the mouth or dislodgement of the intact denture, in either case with the possibility of causing airway obstruction, especially if the person is rendered unconscious at the time of the incident. Finally, mouthguards are always worn on the upper jaw, except in cases of mandibular prognathism, when the lower jaw is more prominent than usual and the lower front teeth are anterior to the upper front teeth.

Recently published figures of similar studies in club Rugby in England show between 23.8% and 38% of players wore mouthguards regularly, and between 38.4% and 27% had sustained previous dental injury (Davies et al, 1977; Upson, 1982), whereas Myers (1980) in a comprehensive report of Rugby injuries at Ballymore (Brisbane) found no cases of dental injury, due, he stated, to the almost universal wearing of mouthguards in club and representative teams. Myers (1980) also reported that there was no significant difference in the overall risk of injury occurring between the forwards and the backs, but noted that forwards were more liable to sustain facial (and therefore dental) injuries. However, Davies et al (1977) had found that the risk of dental injury was unrelated to the playing position, but was related to the level of competition being played.

As comprehensive studies of the incidence of orofacial injuries and attitudes to use of mouthguards in Rugby players has been limited to the club level, it was decided to compare the results of this study with that of the 1984 Great Britain Rugby League Touring Team (Chapman, 1985b). This comparison is shown in Table I.

There was over three times the rate of mouthguard usage in the Wallaby team (80% and 25% respectively) and this practice in part would explain the reduced prevalence of orofacial injuries (33.3% compared to 60.7%) and dental injuries (20% compared to 50%). Also the average age when mouthguards were first worn is a significant factor and this was 13.1 years for the Wallaby team and 20.2 years for the Great Britain R.L. team. The delay in wearing mouthguards in the Great Britain R.L. team was 9.7 years compared to 1.9 years in the Wallaby team while almost three times as many of those Wallabies wearing mouthguards felt that wearing mouthguards should be compulsory (75% and 28.6% respectively). The figures for the Wallabies would in part reflect more public awareness of the acceptance of mouthguards in contact sports in Australia, and in particular the influence of coaches and parents.

The importance of the protection provided by mouthguards can be gauged when both teams are combined and examined in relation to whether those who sustained orofacial injuries were

Table I

	1984 Wallabies	1984 Great Britain Rugby League Touring Team
Average age	24.9 years	24.1 years
Average duration of playing	13.6 years	13.4 years
% of all team members who believe mouthguards provide local protection	100%	100%
% who wear mouthguards regularly	80%	25%
% of custom type mouthguards used	95.8%	100%
Average delay before wearing mouthguards	1.9 years, at 13.1 years of age	9.7 years, at 20.2 years of age
% who had sustained previous orofacial injury *	33.3%	60.7%
% who had sustained previous dental injury	20%	50%
% of wearers who believe mouthguards should be compulsory in their code	75%	28.6%

*Orofacial injury includes dental injury, intraoral and circumoral lacerations, and jaw fractures.

wearing a mouthguard at that time. In such analysis, approximately 4 out of 5 (77.8%) of those injured were not wearing mouthguards at that time and this is statistically significant ($P < 0.05$ using the Fisher exact probability test). Finally, approximately 1 in 3 (32.3%) of those who wear mouthguards in the combined group would be unwilling to play a match without their mouthguards, while only approximately 1 in 10 (12.9%) would play without their mouthguards.

CONCLUSION

Previous comprehensive studies of orofacial and dental injuries in Rugby football players have been performed at club or school level only and the present study is the first such study of a large group of international Rugby players, the 1984 Wallabies. The usage of mouthguards was very high in the 1984 Wallabies, and it was significant that 75% of those players who wore mouthguards believed that wearing mouthguards should be made compulsory when playing Rugby. Custom type mouthguards can be made for all participants in contact sports, even those who are edentulous (Chapman, 1985a). Since the risk of dental injury occurring whilst playing Rugby appears unrelated to the playing position, all players should be encouraged to start wearing them early when they first start playing regular competition, especially before higher grades are reached when the risk of injury increases (Davies et al, 1977).

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