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Sanajay Kumar
Senior lecturer, Dept of
Prosthodontics, College of Dental
Sciences & Hospital, Amargadh,
Bhavnagar Dist, Gujarat, India

A.P Nirmal Raj
Dean & HOD, College of Dental
Sciences & Hospital, Amargadh,
Bhavnagar Dist, Gujarat, India

Correspondence:
Sanajay Kumar
Senior lecturer, Dept of
Prosthodontics, College of Dental
Sciences & Hospital, Amargadh,
Bhavnagar Dist, Gujarat, India

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Mouthguards and its importance in prevention of sports related orofacial injuries: A review

Sanajay Kumar, A.P Nirmal Raj

Abstract

One of the recent and upcoming fields of dentistry is sports dentistry. It is related to the study, prevention as well as management of the orofacial traumatic injuries occurring during different outdoor and indoor sports. Young children and adults usually face various sports related orofacial injuries, which can harm lips, cheeks, tongue and teeth. One of the important aspects of this is the prevention of such types of injuries by wearing of basic protective equipment's like mouthguards. Many of the sportsmen as well as dental practitioners are usually not aware of the importance and use of the mouthguards. This present article gives brief review of the mouthguards and its importance in prevention of sports related orofacial injuries.

Keywords: Dental injury, Mouth guards, Sports, Trauma.

1. Introduction

Sports are related to recreation practiced by the individuals in today's stressful life cycle. Also the sports, mainly contact sports are becoming popular nowadays. The young athletes involved in the various sports activities usually face orofacial injuries. Therefore the role of the dental profession in association to prevention of the dental as well as orofacial sports related injuries is more important [1-3].

Orofacial injuries are distressing event, which can cause physical as well as psychological trauma to the patient's life, as the teeth and the nearby oral structures are usually in the front region. It is particularly common among athletes and sports related dental injuries said to account for nearly 40% of the total orofacial injuries [4].

During the decades of the 1960s and 1970s, the use of mouthguards was made mandatory for certain sports like lacrosse, football, ice hockey, boxing and field hockey. The reason for this change in rule was to provide an additional protection against dental and maxillofacial injuries and importantly to decrease the risk of concussion [5]. The use of mouthguards reduces the resulting complications which can be time consuming and costly [3].

2. Sports related injuries

The sports related injuries in the orofacial region include those occurring on soft tissues and hard tissues, like teeth and facial bones. The hard structure injuries include luxations, tooth intrusions, crown and/or root fractures, avulsions as well as maxillofacial fractures [1, 2, 6] The soft tissue injuries can occur as lip cuts, cut gums, cuts to the face or cuts to the tongue [7].

Some individuals are at higher risk of dental injuries, which includes people with protruded front teeth, inadequately covered front teeth, orthodontic treatment undergoing patients, etc [7].

3. Mouthguards

Any medical field, including dentistry and particularly sports dentistry, always advise protection. Most of the orofacial injuries can be decreased or minimized by the use of the mouthguards (Gumshield). Mouthguards are the removable intra-oral devices, more commonly used in the maxillary arch, as it is the more susceptible area to the traumatic injuries [5, 8].

Mouthguards, if used correctly, distribute the impact of a blow evenly throughout the teeth and other oral structures and protect the teeth, gums and lips or reduces the chances of injury [8].

Therefore mouthguards should be used in all sports activities, especially where contact, fall or collision can occur [8].

The mouth guards were usually made of the following materials^[7]:

1. Poly vinyl acetate-ethylene- copolymer clear thermoplastic.
2. Polyurethane or
3. Laminated thermoplastic.

Use of ethylene vinyl acetate (EVA) is preferred because of its non-toxicity, minimal moisture absorption, elasticity, and ease of manufacture^[7].

Several studies were done till date on the use of mouthguards, which shown that they are effective in reducing soft and hard tissue injuries. Thus nowadays, a number of organizations in various countries promote their use or also made them compulsory to use, like in rugby union, American football, ice hockey, etc^[9].

For the provision of the adequate protection, following points should be considered^[10, 11]:

- Mouthguards should be made up of resilient material, which should be approved by the U.S. Food and Drug Administration
- Mouthguards should be properly fitted and accurately adapted to the mouth and to his/her oral structures.
- It should be physiologically compatible with the wearer.
- Mouthguards should cover all remaining teeth on one arch, customarily the maxillary.
- Mouthguards should stay in place securely and comfortably
- It should have high-impact energy absorption and decrease transmitted forces upon incidence of impact.
- It should be comparatively easy to clean.

4. Types of mouthguards

The American Society for Testing and Materials (ASTM) classifies mouthguards into three categories^[12, 13]:

Type I or Custom-fabricated mouthguards: - These are produced on a dental model of the patient's teeth by either the heat-pressure lamination technique or vacuum-forming technique.

Type II or Mouth-formed or Boil-and-bite, mouthguards: - They are made from a thermoplastic material adapted to the teeth by finger, tongue, and biting pressure after immersing the appliance in hot water.

Type III or Stock mouthguards: - They are purchased over-the-counter.

5. Care of the mouthguards

As the mouthguards are used in the oral cavity, it is always in contact with the saliva. Therefore to reduce the risk of saliva contamination, it is suggested that it should be cleansed with antiseptics for the disinfection. Thus the awareness about the care of the mouthguards should be increased to decrease the chances of cross-contamination, chances of infections and also for the reduction of the surface contamination^[8].

6. Future perspectives and conclusion

Sports always carry risk of traumatic injuries. Mouthguards are protective in a number of orofacial injuries. Therefore awareness regarding mouthguards importance and use should be encouraged to have less impact on the patient's future quality of life.

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