Original Article

Sports Dentistry: A Literature Review

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Doi: 10.47750/pnr.2022.13. S05.209

Abstract

Sports competitions and recreational activities are practiced by infants, kids, and teenagers for their physical and mental health. Unfortunately, engaging in sports increases the chance of suffering trauma to the mouth's delicate and hard tissues, including lacerations to the lips, various injuries to the gingiva, tongue, or mucosa, chipped, luxated, or avulsed teeth, maxillary or mandibular fractures. The importance of the dentistry profession in connection to the prevention of dental and other orofacial sporting injuries has increased due to the popularity of contact sports and the encouraging of participation at a young age. Inculcating the prevention, management, and treatment of oral and face injuries, sports dentistry is the newest and most promising area of dentistry. Dentists should make it a point to tell parents about the orofacial damage caused by sports and about the different preventive measures that are available. They should also have solid clinical understanding of sports-related dentofacial injuries. In this article, we go over the different facets of sports-related injuries as well as the risk factors that go along with them.

Keywords: Injuries, Sport Dentistry, Mouthguards

INTRODUCTION:

The most frequent orofacial injury received while playing sports is a dental injury.[1] In light of this, the role of the dentistry profession in regard to prevention of dental and other orofacial sporting injuries has grown more crucial. Contact sports are becoming more and more popular, and young athletes are encouraged to engage.[2] People who participate in sporting activities are at risk for dental trauma, so athletes, coaches, athletic directors, athletic trainers, parents, and dental professionals should be aware of this.[3] Soft tissue injuries are the most frequent orofacial sports-related injuries, while hard tissue injuries to the teeth and facial bones include intrusions into the teeth, luxations, fractures of the crown and/or root, complete avulsions, and dental-facial fractures.[4]

One of the newest and most promising areas of dentistry is sports dentistry. It mostly entails the prevention and treatment of orofacial injuries and oral disorders related to athletics. The sports or team dentist helps athletes with mouth injury prevention, treatment, and diagnosis. Wearing basic protection equipment, such as properly fitting helmets, face masks, and/or mouth guards, is the most important factor in reducing sports-related orofacial injuries. The most frequent orofacial injury suffered while participating in sports is a dental injury. Many athletes aren't aware of the health risks associated with mouth trauma or the possibility of suffering serious head and orofacial injuries while competing.[4] In this article, we go over the different facets of sports-related injuries as well as the risk factors that go along with them.

EPIDEMIOLOGY OF SPORTS RELATED INJURIES:

Teenagers' risk for musculoskeletal injuries from sports is somewhat influenced by growth and development-related factors. The majority of sports-related injuries are musculoskeletal and 11–40% of all sports injuries involve the face.

Table no. 1: Factor Associated with Sports Injuries	
Factors	**Interpretation**
Age	Sports-related injuries typically affect teenagers and young adults, and it should be remembered that trauma to the primary dentition in young children, before the eruption of the permanent incisors, most frequently results in luxation injuries that are noticeably different from those in the developing permanent dentition.[5]
Gender	The evidence supports the fact that boys seem more vulnerable than girls to orofacial injury.[6]
Body Size	Higher risk of injury for athletes with larger frames; increased leverage due to longer limbs and/or stronger limbs; and stress on joints as a result of added weight.[6]
Height and weight	Increase in rate of height and weight during adolescence contribute to increase in momentum and force during collision with another athlete; increased weight also increases stress and load to skeletal structures.[7]
Muscle growth and strength	There is increased muscle hypertrophy and associated increase in strength during adolescence. This is relatively more pronounced in males compared to females.[7]
Flexibility	During the teenage development spurt, there is a relative period of decreased total musculotendinous flexibility. Generally speaking, women are more flexible than men.[8]
Growth cartilage	The immature growth plate is vulnerable to stress injury.[7]
Motor skills and performance	Adolescence is a period of improvement for motor abilities. This is linked to better motor function and may help athletes accomplish tasks particular to their sport more effectively. The development of motor abilities differs between men and women.[7]
Psychological and psychosocial factors	Any psychological elements, such as stress, worry, or pressure to perform well, may cause a person to become less focused on the sport's demands and/or make them more susceptible to exhaustion, which may be a contributing factor to sports injuries.[9]

SPORT INJURIES AND EVOLUTION:

The face is the most exposed and typically least protected part of the body. 8% of all face soft tissue injuries are caused by sports-related facial injuries. 11 to 40 percent of all sports-related injuries involve the face. The majority of the time, these injuries are brought on by player-to-player contact or direct ball hits.[10]

Fracture to the bones, tooth-related injuries like fractures, intrusion, luxation, crown and/or root fractures, temporomandibular joint injuries, tooth wear, abrasions, and lacerations are some of the injuries that may occur during sports.[11] The soft tissue injuries and "T-zone" bone fractures (mandible, zygoma, and nose) are the most frequent types of sports-related facial trauma. Combinations of these injuries are frequent.[4]

Airway, breathing, circulation, and impairment should be assessed first when evaluating face injuries in accordance with trauma evaluation guidelines. Following the first evaluation and stabilisation, a systematic facial examination is carried out, paying close attention to significant bone landmarks, neurovascular structures, and soft tissues. The initial survey is the first and most important step in evaluating individuals who present with trauma. At the same moment that resuscitation is starting, any life-threatening injuries are discovered.

The order in which issues should be solved is remembered using the shorthand ABCDE (airway, breathing, circulation, disability, and exposed environment control). The secondary survey can start once the main survey is finished, resuscitation procedures are firmly established, and the vital signs are returning to normal.[12] The secondary survey involves a thorough evaluation of the trauma patient from head to toe, including a thorough physical examination and rechecking of all vital signs. The entire body must be examined, from head to toe. X-rays are obtained as recommended by the examination. Another primary survey is done since there can be a possible threat to life if the patient starts to worsen at any point during the secondary survey. Any soft tissue injuries and noticeable asymmetries of the facial shape (indicating underlying bone fractures) are documented once any potentially fatal injuries have been ruled out. The face is examined in great depth after that. Each healthcare professional needs to establish a methodical routine in order to conduct an exhaustive examination. Starting at the scalp and working down is a frequent strategy.[4]

PREVENTION OF SPORTS RELATED DENTAL INJURIES:

To lessen the risk and severity of sports-related traumatic injuries to an athlete's head, face, and mouth, various sports currently mandate the use of helmets, facemasks, and mouthguards.[13]

PROTECTION FROM SPORTS-RELATED OROFACIAL INJURIES CURRENTLY COMES IN THE FORM OF THREE SHIELDING EQUIPMENT – MOUTHGUARDS, FACEMASKS, AND HELMETS

Mouthguards:

In order to protect the peri-oral soft tissues from harm, a London dentist named Woolf Krause invented mouth guards in the 1890s. Mouth guards are hard devices that fit in between teeth and are useful in a variety of sports.[14,]

There Are Mainly Three Types Of Mouthguards:

Stock Mouthguards:

According to the Academy of Sports Dentistry, the standard mouthguard is unsuitable as an orofacial protective device. As stock mouthguards are only offered in a few sizes, they result in incorrect fitting, which causes discomfort and irritation while being used. However, because this permits tooth mobility while also safeguarding sensitive tissue, an orthodontist advises against it.[15,16]

Mouth-formed Protectors:

The thermoplastic mouthguard and the shell liner are two varieties of mouth-formed protectors. The shell liner type consists of a prefabricated shell and a silicone rubber or plastic acrylic liner. The player's mouth is filled with the lining material, which is then sculpted to fit their teeth before being left to set. This type's drawbacks include decreased retention brought on by repetitive biting and hardening of the soft liner, an expansion of the occlusal vertical dimension, pain, and bulkiness. The premade thermoplastic lining, sometimes referred to as "boil and bite," is submerged in boiling water for 10-45 seconds before being transferred to cold water and adjusted to the teeth.[16,17]

Custom-Made Mouth Protector:

This is the best and most expensive option available. They could be made from a variety of materials, including latex or latex-reinforced, vacuum-formed transparent or colored plastic sheets, or acrylic resin that has been plasticized.

Two types of custom mouthguards include pressure-laminated and vacuum-formed mouthguards. The most popular type of mouthguard made by a dental practitioner is a custom vacuum-formed mouthguard. Speaking and breathing are least hindered, and it gives adequate protection against sports-related severe oral injuries. However, because they only keep their shape for a short while after being worn, they do not offer protection for a long time. A more balanced occlusion is possible with pressure-laminated mouthguards, which are more retentive than other mouthguards. When worn over an extended period of time, it experiences minimal deformation. According to the literature, this mouthguard provides children's teeth with the best protection during all sports activities, as well as exact adaptation and little deformation.[18]

Table no. 2: According to the ADA Specifications for mouth guards
• A thickness of 4 to 5mm is recommended for adequate protection.
• Should be properly fitted to the wearer’s mouth and accurately adapted to oral structures.
• Should be made of resilient material approved by FDA and cover all remaining teeth on one arch, customarily the maxillary.
• Stay in place comfortably and securely.
• Must be physiologically compatible with the wearer.
• Should be relatively easy to clean.
• Must Have high-impact energy absorption and reduce transmitted forces upon impact

Helmet:

They are designed to shield the skin on the scalp and ears from abrasions, contusions, and lacerations. They guard the skull's bones against breakage as well as direct concussions, loss of consciousness, cerebral hemorrhage, brain damage, coma, and death of the brain and central nervous system. Between the 1920s and the beginning of the 1950s, the sturdy leather helmet dominated the football helmet market1. This style of helmet was formed of various layers of leather that were stitched together to protect the athlete's head, lateral areas of the face, and ears.[19]

Facemask:

They are designed to protect the lips, zygomatic arches, eyes, nose, nasal pyramid, and other facial structures against harm caused by objects like fists, balls, sticks, and hockey pucks. When used appropriately, face masks improve player safety and reduce morbidity. Various sizes of plastic or rubber tubing, welded steel, or aluminium are used to make face masks, which are then covered in a vinyl plastisol coating. The first facemask style to be used in football was a single bar with contours, which was introduced in the 1950s. Both styles of facemask offer varied degrees of protection to the maxilla from an extended finger, clenched hand, forearm, or helmet pointed at the mandibular arch or zygomatic region of the eye.[13,20]

CONCLUSION:

Although sports dentistry is still in its infancy, it should include much more than the creation of mouth guards and the repair of broken teeth. As a member of the medical community, dentists have a duty to learn about sports dentistry, in particular the prevention of oral and maxillofacial injuries caused by sports, and to impart that knowledge to the public. Sports dentistry may be very rewarding, not just for the goodwill created, but also for the personal satisfaction obtained when the dentist realises that in addition to treating the injured athlete, they may have also avoided many other potential injuries. Since "everyone has a smile worth protecting," sports dentistry is certain to play a role in our future.

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