

PROSTHODONTIC TREATMENT APPROACH OF COMMON DENTAL INJURIES DURING SPORT ACTIVITIES - case report

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Abstract

Several different sports like karate, handball, basketball, or some other sport activities like riding a bike or roller skaters often cause dental trauma in young patients. Accidental falls, impacts and hits play major role in these injuries, sometimes even with serious health impact. Soft tissue trauma presents a high percentage of injuries, but 40% are dental traumas, and upper maxillary incisors are most affected.

Fractured or lost upper first maxillary incisor demands immediate restoration. Prosthetic solutions for different sport facial and dental traumas are crowns, removable partial dentures or implants. Managing the pain fast with different treatment choices like extraction of the tooth, endodontic treatments and early temporary prosthetic therapy protocols are showing good results. Individual approach for every type of trauma is needed, and most of the patients are accepting the suggested treatment plan. Restored teeth show good aesthetic and function solutions, too.

Choosing the best therapy treatments in these patients is very important, because dental trauma can also cause some psychological and social problems. Immediate treatment is necessary, and proper restoring often demands a team effort.

Keywords: sport dental injuries, fracture, mouthguards

Introduction

Sports Dentistry is the branch of sports medicine that deals with the prevention and treatment of dental injuries and related oral diseases associated with sport and exercise. Several different sports like karate, handball, basketball, volleyball, or other sport activities like riding a bike or roller skating are common reasons for dental trauma in our patients.

Accidental falls, impacts and hits play major role in these injuries, sometimes even with serious health impact. Trauma of the soft oral tissue and face presents a high percentage of injuries, and over 40% of injuries are dental traumas, and upper maxillary incisors are most affected [1].

There are some sports-related dental injury reports throughout the world in the dental literature. Unfortunately, there are not many published studies regarding dental injuries and participation in sports in the Republic of Macedonia. Many surveys were based on prospective questionnaires given to selected groups of athletes and coaches, while other studies collected data from hospital emergency rooms and dental clinics [2].

With increasing the number of individuals involved in sports activities, the number of athletic dental injuries also increases. Geographical location also has impact on different injury frequencies, because popularity of different sport varies by region [3].

Studies that focused on groups of athletes, rather than the general population, showed higher injury rates [4].

Comparing injury statistics can be difficult as there is no uniform system for reporting the number of injuries [5].

There are three basic categories of traumatic injuries in the oral cavity, and they are teeth injuries, periodontal tissues injuries and injuries of the supporting bone [6].

Teeth injuries can appear as crown fractures with or without involving enamel, enamel and dentin, and pulp, crown-root fracture and root fracture [7]. Periodontal tissues injuries can be without displacement and displacement injuries - intrusion, extrusion and avulsion [8] (Figure 1).

In the early ages, boys are with a higher prevalence of dental trauma than girls, but this sex difference may change with age. Over 9% of young adults aged 18 to 19 years, who have been training at least one sport, have experienced dental injuries during sports participation at some point in their lifetimes [9].



Figure 1. Avulsion of upper maxillary incisor with upper lip laceration

Dental sport injuries are also classified by the severity in three groups: mild, moderate and severe injuries [10].

Mild dental injuries present uncomplicated crown fractures and contusions, moderate injuries are complicated crown fractures and tooth subluxations, while severe injuries are crown and root fractures, luxation and avulsion [11].

The aim of the paper was to present the different prosthodontics treatment approach in young patients with sport dental trauma.

Case reports

The presented case reports discuss the sports-related dental injuries to the anterior teeth and their prosthodontics treatment. The first patient was a young healthy boy, aged 18 years, who used to play handball regularly for couple of years. He had an injury during competition game, when he fell on the ground, hitting his face and teeth. During the fall his upper left incisor had fractured without pulp exposure, with mild pain, so he continued the game till the end (Figure 2).

He came to the University Dental Clinic in Skopje, at the Department for Preventive Dentistry, two hours after the injury, where he received first aid. Clinical examination revealed that the injury was asymptomatic, but the fractured segment was not found. No apparent trauma to the soft tissues in the intraoral and extraoral examination was noted.



Figure 2. Sport crown trauma of upper left maxillary incisor

The patient received conservative treatment at the moment, but after several months he came back without the resin filling, and asked for permanent prosthodontic treatment. Restoring a single central incisor can be a very demanding job especially for esthetic reasons.

We had to take great care in choosing proper restorative material, preparation of the damaged crown and proper shade optimization. Tooth preparation was made with local anesthesia; we took the impression, tried-in the metal-ceramic crown, achieved proper shade and hue. After checking the occlusion with the opposite teeth and giving superficial characteristics of the prosthetic restoration to

match natural teeth, we did provisional cementation in one week. On the last visit, we permanently cemented the crown with a glass ionomer cement in the patient's mouth, and did selective grinding and polishing of the tooth 11 in order to correct the natural form and position for achieving better esthetic appearance (Figure 3).



Figure 3. Metal-ceramic restoration on left upper maxillary incisor

The second patient was a younger boy aged only 15 years, but had more severe dental trauma of the upper right maxillary incisor. The anamnesis showed that his dental trauma was a result of roller skating, when he lost balance, fell, and hit the concrete ground with a high speed and great impact. The patient did not wear any protective devices for preventing head and mouth injuries.

After the first aid toilet of the wound for stopping bleeding at the Department for Preventive Dentistry, an X-ray was made. It showed a severe dental trauma with fracture of the tooth root (Figure 4).



Figure 4. Preoperative X-ray of the upper right incisor

The tooth was extracted with local anesthesia, and the patient was sent home with prescription of antibiotics and pain killer tablets (Figure 5).



Figure 5. Postoperative situation

The patient was minor, under 18 years old, so the therapy protocol for his injuries was to manufacture temporary removable partial acrylic denture, fixed with clasps in the patient mouth, until he reaches proper time for fixed prosthodontic treatment (Figure 6).



Figure 6. Removable partial maxillary denture

Discussion

Choosing the best therapy treatments in patients with dental injuries is very important, because dental trauma can also cause some psychological and social problems. Immediate treatment is necessary, and proper restoring often demands a team effort of specialist of pediatric dentistry and prosthodontics [12].

Sports dental injuries policy on prevention was adopted in 1991 with two major components. The first was the treatment of orofacial injuries and the second was the prevention of the injuries [13].

If a clinician had the ability to identify effectively individuals who were at high risk of sports-related dental traumatic injuries, some preventive intervention could be implemented¹⁴.

Most sport dental and orofacial injuries affect the upper lip, maxilla, and maxillary incisors, with over 50% of dental injuries impacting the maxillary incisors [15,16,17].

The use of a mouth guard can protect the upper incisors. However, studies have shown that even with a mouth guard in place, up to 25% of dentoalveolar injuries still can occur [18,19].

Dental injuries incurred during sports activities are highly treatable, and can involve good outcomes if participants act quickly to see a dentist after an injury event.

However, if not treated quickly these kinds of injuries can lead to discomfort, embarrassment and a lifetime of dental costs [20].

In 2000, a predictive index was developed to identify the risk factors involved in various sports [21].

This index was based upon a defined set of risk factors that predict the chance of injury including demographic information (age, gender, dental occlusion), protective equipment (type/usage), velocity and intensity of the sport, level of activity and exposure time, level of coaching and type of sports organization, whether the player is a focus of attention in a contact or non-contact sport, history of previous sports-related injury, and the situation (e.g., practice vs game) [22].

However, it has to be mentioned that the sports injuries of the mouth and oral tissues are not necessarily treated any differently than other traumatic injuries of the oral tissues.

Conclusion

Managing the bleeding and pain, extraction of the tooth, endodontic treatments and proceeding early temporary prosthetic therapy protocols showed very good results. Patients were treated according to the type of trauma, and every suggested treatment was accepted. Restored teeth had a good aesthetics and recovered their function, too.

Choosing the best therapy treatments in these patients is very important, because dental trauma can also cause some psychological and social problems. Immediate treatment is necessary, and proper prosthodontic approach for restoring lost functions often demands a comprehensive team effort.

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