

Soccer-Related Craniomaxillofacial Injuries

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The authors assessed the rate of craniomaxillofacial fractures in soccer and the areas where they occur, describing above all the injury pattern of this sport. Over a 5-year period (1995–2000) 46 cases of 329 with fractures associated with different sports activities have been surgically operated at the maxillofacial surgery department of the Policlinico “Umberto I” Hospital, University “La Sapienza” of Rome.

All data collected have been selected on the basis of sex, age, anatomic site of the fracture, and the practiced sport. Information on injury patterns, severity, and play circumstances have been documented.

The department examined 7 sports disciplines, but soccer was responsible for sports-related maxillofacial fractures in 34 of 46 cases (73.9%). All 34 fractures occurred to men.

In soccer, the zygomatic and nasal regions are mainly involved. In fact the authors examined zygomatic fractures in 15 cases and nasal fractures in 10 cases. Direct contact between players generally causes soccer-related maxillofacial fractures: head–elbow impacts (21 cases) or head–head impacts (14 cases).

The male:female ratio is 6.6:1, while the average age is 25 years for males and 23 years for females.

In comparison with other sports (rugby, football, etc...) where physical contact occurs more frequently and the higher incidence of traumatic events justifies the use of protective measures, soccer is not a particularly violent sport. In soccer, maxillofacial traumas are caused by violent impacts between players that take place mainly when the

ball is played with the forehead. In this moment there can be an elbow–head impact or a head–head impact.

The authors believe that the low incidence of fractures, severity of the lesions, and discomfort caused by possible protective masks make their use unjustified. The data collected during this study witness that in soccer 21 of 34 cases of maxillofacial fractures are caused by elbow–head impacts. This fact suggests a preventive strategy against violent behavior in soccer play. Because the use of any sort of helmet proved impossible, the introduction of more severe penalties and a greater respect for the rules of the game by the players could reduce the percentage of impacts during matches. Impacts cause the most serious and frequent lesions in the maxillofacial region.

Key Words: Facial fractures, sports injuries, soccer.

Traumas to the maxillofacial area represent a subject of remarkable importance and great current interest because they are responsible for a high percentage of the hospitalizations in the maxillofacial surgery wards.

In terms of incidence, the chief causes of maxillofacial traumas are car and motorbike accidents¹ (48.5%), domestic accidents (28.2%), accidents at work (16.4%), and violence and sports accidents (6.9%).

Sports accidents increased dramatically^{2,3,4} because of a greater number of people practicing different sports and because of the relatively new introduction of more dangerous sports.

Different kinds of traumatic action contribute to determining various clinical conditions: contusion mechanisms, triggered by sprain or by a complex contusion-related action, may correspond to contusions; abrasions; linear, punctiform, lacerated, and lacerated–contused wounds; and simple and compound fractures.

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Whereas wounds require outpatient treatment, fractures require surgical treatment, which varies according to the site and the type of the lesion.

This work, a clinical–statistical contribution of the Maxillofacial Surgery Department of the Policlinico Umberto I hospital—University “La Sapienza” of Rome, was carried out from December 1995 to December 2000 to assess the incidence of maxillofacial traumas sustained during sporting activities, especially during soccer matches.

METHODS

Every year approximately 44,000 cases of trauma arrive at the Casualty Department of the Policlinico “Umberto I” hospital of Rome; approximately 1200 of these cases present lesions of the maxillofacial region. In the period between December 1995 and December 2000, 5920 patients were examined: 329 of these were operated because of fractures and in 46 patients fractures were sustained during a sporting activity (soccer, boxing, skiing, full-contact martial arts, riding, cycling, and gym accidents).

All data collected, considered relevant to our clinical point of view, have been selected according to sex, age, location of the fracture, and kind of sport.

Each of our patients underwent a clinical examination, an instrumental survey, and surgical treatment. Following the postoperative follow-up (6–12 mo), our patients presented no complications. We have carried out a simple analysis of the data for this study with the aid of some easily interpretable graphs.

RESULTS

In the cases we examined, 40 accident victims (87%) were males aged between 14 and 35 years, with an average age of 25 years, and six were females (13%), aged between 20 and 26 years, with an average age of 23 years.

Total age distribution was 26.47% for the second decade, 52.94% for the third decade, and 20.58% for the fourth decade (Table 1).

Skiing, full-contact, boxing, riding, cycling, gym activities, and soccer are the causes of fractures found in our study. Soccer is the main cause of maxillofacial-related fractures (73.9%), breaking down as follows: 15 cases of zygomatic fractures, 10 cases of nasal bones fractures, 5 cases of mandibular fractures, and 4 blow-out fractures (Table 2). All 34 cases of soccer-related maxillofacial fractures were males.

Although through different modalities, soccer-related fractures are provoked by direct contact be-

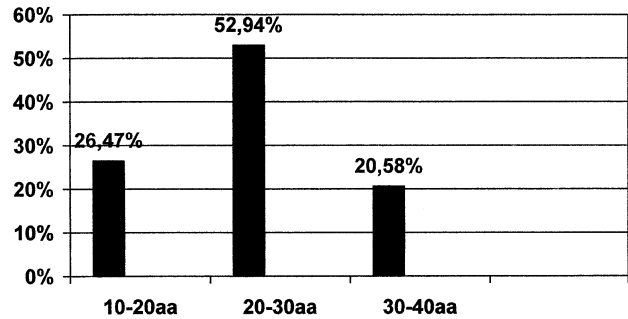


Table 1 Total age distribution was of sports-related maxillofacial fractures.

tween players: in 21 cases elbow–head impact is responsible for 9 zygomatic fractures, 3 mandibular fractures, 5 nasal bone fractures, and 4 blow-out fractures; in 12 cases head–head impact is responsible for 2 mandibular fractures, 5 nasal bone fractures, and 5 zygomatic fractures. Only 1 case of zygomatic fracture caused by the kick of a goalkeeper was reported. Analyzing the mandibular fractures in detail, we noted that they occur more frequently in the angle (3 cases) and in the condylar region (2 cases).

DISCUSSION

In the past 10 years, the increasing popularity of all sports and the subsequent increase in the incidence of sports-related maxillofacial fractures (varying between 2.5% and 28.5%)³ has drawn attention toward possible measures to prevent lesions occurring during sports activities.

Sports accidents may occur in three ways: fall, impact with sports equipment, and violent contact between players. Violent contact is the main cause of fractures.⁵

According to Peynègre and Strunski’s⁶ classification, the maxillofacial region involved in a traumatic event may be broken down into three sections:

Table 2. Sports-Related Maxillofacial Fractures

	Zygomatic Fractures	Nasal Bones Fractures	Blow-Outs	Mandibular Fractures
Soccer	15	10	4	5
Skiing	1			1
Riding				1
Boxing		2		
Cycling	2			2
Gym activities			1	1
Full contact				1

Lower area: this includes the mandible and the maxillary bone; this area is most frequently involved in cycling, motorcycling, and riding.

Medial area: this includes the maxillary process, nose, ethmoid, and orbital cavity; this area is involved above all when a collision between players takes place, as in basketball, rugby, or football; or with sports equipment as in tennis and volleyball.

Lateral area: this includes bone and zygomatic arch: this is mainly involved in skiing, soccer, and Sumo wrestling.⁷

The frequency of maxillofacial lesions varies according to the popularity that each sporting activity has in a particular country. Of course this popularity is strictly connected to the social and cultural characteristics of the various sports fans.

In a study carried out in Innsbruck on the incidence and causes of mandibular fractures, Emshoff⁸ assessed that skiing, followed by cycling and soccer, represents the main cause of accidents.

In England rugby, cricket, and soccer involve high risks of lesions.⁹

In USA baseball, practiced by 16 million teenagers, is responsible for 30% of facial traumas,¹⁰ more frequently involving orbital cavity, nasal, and zygomatic bones.¹¹

In Italy Frenquelli *et al.*¹² reported that soccer is responsible for 64.8% of maxillofacial traumas; they usually are a consequence of a collision between players during a match.

These pieces of data correspond to our series of cases: soccer represents the main cause of maxillofacial fractures (73.9%) definitely. According to Frenquelli, the most frequently affected sites during a soccer match are the orbital-zygomatic (44.1%) and nasal regions (29.4%). The explanation of these data may be that in Italy soccer is the most popular sports activity, especially among men. The wide popularity of the various closely fought championships encourages a large number of fans, in a sort of collective emulation, to play soccer in their spare time.

Although soccer is not particularly violent, it very often involves player contact; maxillofacial traumas, in fact, are caused by violent impacts between players, which generally take place when the ball is played with the forehead: elbow-head impact and head-head impact are the most frequent ones.

In very rare cases, traumas are caused by collisions of a player with sports equipment (in this case the ball). Falls generally provoke traumas of orthopedic interest.

The age and sex distribution of our study pinpoints the fact that, according to the results reported by other authors,^{8,12} the majority of the sports-related maxillofacial fractures occurs between the ages of 15 and 35, in soccer involving only men (34 cases). Very few women, in fact, play soccer in our country.

In comparison with the mass of people who systematically practice any sort of sports activity, the number of sports-related facial lesions is relatively low.

By deeply analyzing our series of cases, we noted that the incidence of facial lesions caused by sporting activities is 13.9%. These lesions generally present low severity.

The increase in incidence of sports-related lesions compared with the past may be eased by the use of protective helmets and masks, above all during training.¹³ In fact, the recent use of these protective tools in some countries (USA, Japan, and Australia)^{14,15,16,17} was instrumental in the prevention of craniofacial lesions.

However, we should underscore that sports where physical contact occurs more frequently are more widespread (rugby, football, cricket, etc.) in these countries; therefore, the higher incidence of traumatic events justifies the use of these protective measures.

Conversely, in our country soccer represents the main cause of sports-related facial fractures. In soccer, in fact, playing the ball with the forehead is permitted; therefore this fact makes it impossible to use protective helmets, which not only could limit the game but also cause worse traumas.

In some cases, protective masks for the nasal pyramid and the zygomatic region have been already used, above all at the professional level as local protections in the postoperative period.

We believe that the low incidence of fractures, the scarce severity of lesions, and the potential discomfort caused by masks during the game make their use unjustified in this sport.

The data collected during our study witness to the fact that in soccer 21 of 34 cases of maxillofacial fractures are caused by elbow-head impacts. This fact leads us to suggest a preventive strategy against violent behavior in soccer. Because the use of any sort of helmet has proven impossible, the introduction of more severe penalties and a greater respect for the rules of the game by the players could reduce the percentage of impacts during matches. Impacts are responsible for most of the serious and frequent lesions in the maxillofacial district.

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