FORENSIC ASPECTS OF DENTO-ALVEOLAR AND LOWER JAW TRAUMAS

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Abstract: *Purpose: Noticing an increased incidence of dento-alveolar and lower jaw traumas in Sibiu County, we investigated this phenomenon in order to describe the incidence and epidemiological coordinates. Method: We conducted a retrospective study from 2009 to 2013 on 510 forensic documents from the casuistry of the Forensic Department of Sibiu County. We analyzed the presence of such lesions, trauma mechanism, number of injured teeth, the dental and alveolar region of fracture, the traumatized dento-alveolar region and other. We followed the epidemiological distribution by age, gender and environment of origin. Results: We found increased prevalence of males (85.51%) and similar proportions of urban and rural origin (43.33% urban, 56.67% rural); most of the cases belonged to the age group of 20-29 years old. The frontal teeth group was interested most often; we noted a high incidence of double mandible fractures. The most frequent mechanism of production was the active hitting (71.96%).*

INTRODUCTION

In daily forensic activity, cranio-facial traumas have a high incidence; hence a correct diagnosis implies an efficient interdisciplinary cooperation of physicians in the specialties of dental and oro-maxillofacial medicine.(1) These types of traumas trigger changes in the homeostasis of the human body by involving different structures at cranio-cephalic level. Both, the forensic pathologist and the dental physician are constantly facing dental and dento-alveolar traumas. Traumatic lesions may have both physiognomic and morphofunctional consequences, as well as psychological ones.(1,2) Since there is a wide range of clinical forms of these traumas, the specialized treatment entails a good collaboration between specialized physicians in the field of dentistry, periodontology, endodontics, and oro-maxillofacial medicine. From a forensic point of view, the assessment of the patient status is performed by the pathologist; most of the periodontal injuries occur in the clinical setting of cranio-facial trauma, through direct mechanism (active assault).(3,4,5) In forensic practice, mandible lesions caused by direct mechanism are quite frequent. Considering the localization, the fractures can be classified as follows: median and paramedian fractures, fractures of mandible body and branches, fractures at gonion, condyle coronoid apophysis.(6,7,8) Through the mandible branches mediate fractures may appear at skull base, by the transmission of kinetic energy along the mandible branches.(9,10,11)

PURPOSE

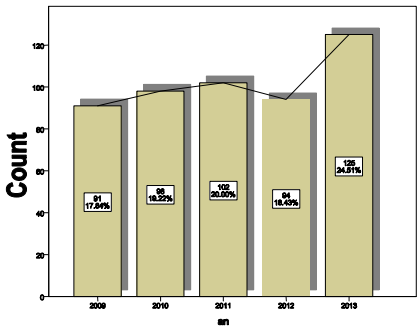
Noting the relatively high incidence of cranio-facial traumas we considered appropriate to investigate this phenomenon in order to describe the incidence and epidemiological coordinates in the casuistry of Forensic Department of Sibiu County.

MATERIALS AND METHODS

In the present study, we have conducted a retrospective longitudinal study on a number of 510 forensic certificates and fact-finding reports from the Forensic Service of Sibiu, during 01.01.2009 - 31.12.2013. The inclusion criteria for the hereby study referred to: dento-alveolar and lower jaw trauma lesions and their associated lesions (perioral lesions, lesions of nasal pyramid and genian region, eye lesions), the production mechanism of various trauma (hitting with blunt objects, followed by collapse, and so on), as well as the number of hospitalization days.(12,13) The most important criterion in the study was represented by the assessment of lower jaw and dento-alveolar lesions. Within this clinical context, we have noted the following: number of injured teeth following the trauma, the dental and alveolar region of fracture, presence of different degrees of tooth mobility, tooth avulsion, the traumatized dento-alveolar region: hemiarcades, upper jaw or the lower jaw. The mandible lesions have been divided according to their localization as such: lesions of the ascending ramus, of base mandible, of mandible angle or lesions of the condyles. Epidemiologically, we have observed the case distribution according to age, gender, and environment of origin.

RESULTS AND DISCUSSIONS

Figure no. 1. Statistical analyses per year regarding the number of mandible and dento-alveolar traumas



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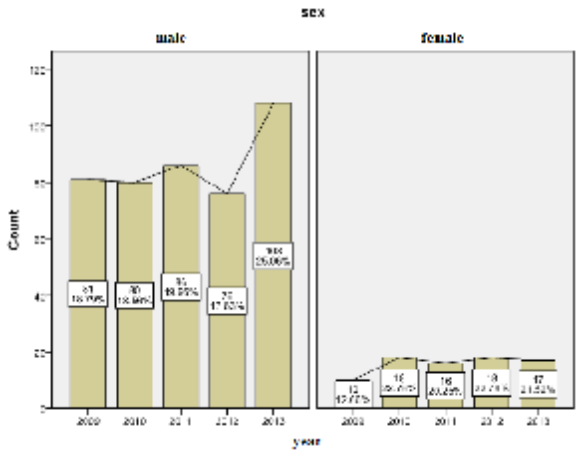
In 2013, the number of traumatized persons with dento-alveolar lesions (N=125, 17.84%) has increased (p=0.025) as compared to the year 2009 (N=91, 24.51%).

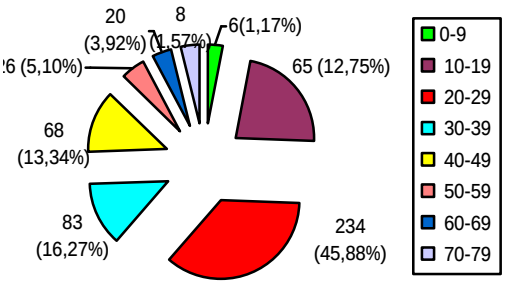
Out of the total number of forensic certificates issued during the 5-year period, 7.53% presented dento-alveolar lesions.

Figure no. 2. Gender distribution of studied subjects



Persons of masculine gender (N=431, 84.51%) are significantly more (p=0.000) than the feminine ones (N=79, 15.49%), during the entire 5-year period of study.

Figure no. 3. Age distribution of studied cases



The maximum incidence was recorded in the age range of 20-29 years (45.88%), followed by the age range of 30-39 years (16.27%). Almost equal percentage (13.34% and respective 12.75%) was recorded for group ages of 40-49 years, respective 10-19 years.

In 2009, there is a slight incidence (p=0.208>0.05) of urban regions (57%) as compared to rural areas (43%), while in 2013 the incidence (p=0.152>0.05) of the rural (57%) is higher than the urban areas (43%). In 2011 and 2012, there can be noticed an important difference (p=0.037<0.05; p=0.005<0.0), since the rural areas have a higher incidence than the urban ones. By cumulating the rural and the urban values on the 5-year period of study, a slight predominance of the rural has been observed (289 cases, 56.67%), and urban (221 cases, 43.33%).

In our study, 72.94% of the total cases presented no gingival blood infiltrates adjacent to dental lesions; only 27.06% had blood infiltrated gums.

Following the association between the frequency of traumas and number of affected front teeth from different areas of the jaw, it has been noticed a maximum incidence on the frontal area, on a maximum number of 2 teeth. In the lateral maxillary area, the maximum incidence of injured teeth was of two teeth. The peak incidence in both areas – frontal and maxillary – involved a number of 2-4 injured teeth.

Depending of the fractured area, the maximum incidence (50.48%) was recorded by dental lesions involving the incisional edge, followed by gum line fractures, with a 22.11% share. A significant percentage was represented by the association of dento-alveolar fractures (9.13%).

It has been observed the mobility and avulse degree and it has been noticed a maximum prevalence of teeth with various post-trauma mobility degrees, with a 63.81% share, 24.34% of the trauma resulted in dental avulsion, and in 11.84% of the cases the two types of injures were associated.

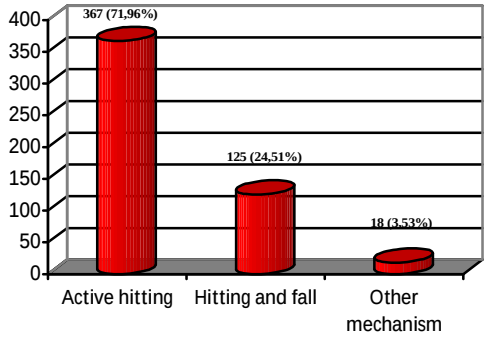
The observation of dento-alveolar lesions in relation to the affected area revealed that the majority of injuries occurred in the frontal group, with a 86.67% share, in 8.61% of the cases the lateral dental group was involved, and a significant percentage (4.72%) of lesions were localized both in the frontal and in the lateral group. Also, the maximum incidence was recorded on the left side of the jaw (41.94%), followed by bilateral locations (31.67%). Maximum prevalence was on the superior arcade (65.28%), 20.28% on the inferior arcade, and 14.44% of the cases referred to both arcades.

Among the observed dento-alveolar lesions, 150 cases were mandible fractures. In this respect, most of the subjects presented double fractures (47.33%), followed by condyle fractures (16%).

Following the distribution of labial lesions associated to dento-alveolar trauma, we have noticed a maximum incidence of those occurred on the vestibular side of the type echymosis-wound (57.6%). There were an important number of cases with no associated labial lesions (14.9%). Significant percentage was recorded for wounds at the vestibular level of lips, as well as associations between the external and internal lesions.

As far as the associated lesions are concerned, we have noticed a 10.4% share of eye lesions. In 41.6% of the cases, the dento-alveolar lesions were accompanied by traumatic lesions outside the oro-maxillofacial area; however, most of the subjects (32%) with dento-alveolar traumas have not presented associated lesions.

Figure no. 4. Distribution of cases depending on the mechanism of production



Taking into account the mechanism of production of the traumatic injuries, we have reached the conclusion that most of them (71.96%) occurred through active hitting. In 24.51% of the cases, the active hitting was followed by fall, and in a small number of cases (3.53%) there were other production mechanisms. As far as the number of medical care is concerned, the maximum prevalence falls into the 0-20 day- category (66.67%), while 33.13% of the cases required between 21 and 60 days of medical care, and just one case required over 60 days of medical care, due to associated traumatic lesions.

CONCLUSIONS

The hereby study revealed an ascendant tendency of dento-alveolar lesions throughout the year 2013 as compared to year 2009.

Of the total number of forensic certificates and fact-finding reports issued, the dento-alveolar lesions represented an important percent.

The masculine gender was clearly preponderant.

Analyzing the age groups, the maximum incidence was recorded within the young sector of age.

As for the environment of origin, the distribution of cases was almost equal, with a slight predominance of urban environment during the year 2009 as compared to the rural environment; during the year 2013, the report suffered modifications, as the rural environment became predominant in statistics as compared to the urban one.

The frequency of the involved teeth within the frontal and lateral group was between 2 and 4. Of all the studied subjects, most of them presented gingival infiltrations associated to the lesions.

The incisional edge was mostly involved, followed in the percentage chart by the gum line fractures.

As for the mobility degree and dental avulsion, the maximum incidence was held by mobility, several cases presented dental avulsion, the rest of cases presented both types of lesions.

Most of the fractures occurred on the frontal dental group, on the superior arcades and on the left side.

In several cases, the traumatic event produced lesions of teeth with advanced parodontopathies. Hence, we can draw the conclusion that the degree of oral hygiene of the patient, the interest for oral health and addressing the dental physician at regular intervals may contribute to the decrease of the effects of a dento-periodontal trauma and its possible complications.

For the mandibular lesions, most of the studied cases presented double mandibular fractures, followed by the condyle fractures.

Of the labial lesions associated to dentoalveolar traumas, the vestibular lesions of the ecchymosis-wound type were the most common. The analysis of the rest of lesions associated to dental traumas showed that an important number of cases had no such lesions. Eye injuries had a high frequency, but most of the cases had lesions outside the oromaxillofacial area.

For most of the dental injuries, the producing mechanism was the active hitting.

Considering the gravity of the traumatic lesions, most of them required up to 20 days of medical care, while a small percent of the cases necessitated between 21-60 days of medical care, and a single case required more than 60 days of medical care, due to the associated lesions.

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