OCCURRENCE OF DENTAL ALVEOLUS TRAUMAS AT
THE UNIVERSITY HOSPITAL CENTER

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ABSTRACT In severe trauma, we must first address vital respiratory and circulatory emergencies. In case of polytrauma and other emergencies, should also be sought and treated. The management of maxillofacial trauma requires a methodical, clinical examination and a thorough radiologic provided mainly through CT. The repair of soft tissue is delicate and requires a fine material and adaptation. The treatment of bone fractures varies depending on their location and importance. Dental injuries have multiple forms, this one among the total dislocation requiring rapid relocation. The objectives of my work will be mainly:

• The description of common and specific protocols that govern the trauma and dentoalveolar bone.
• The study of the prevalence of injuries occurring in adults
• The study of the distribution of injuries by using different variables (circumstances of onset, treatment, type of trauma), according to two factors, age and sex.

KEYWORDS Trauma dental, Alveolar, Basal bone, Epidemiological investigation.

Introduction

Facial trauma is defined as the set of lesions, which can involve the face structures located between the capillary line at the top and the tip of the chin below; his lesions affect the soft tissues, bone architecture and teeth. It is a particular pathological entity characterized by its disparity linked to both:

- To many types of lesions that can affect the different tissues and anatomical structures of the face.
- To the diversity of its therapy, including the prospecting of vital emergencies and subsequently functional precedes the maxillofacial care proper.[1, 2, 3]

The essence of facial trauma is a double-edged sword, which depends on:

- The variety and severity of their after-effects, both aesthetically and functionally, because the face is a provider of a person’s identity; knowing that a number of loss of substance and unsightly scars can generate serious psychological disorders, as well as repercussions on speech, a real social passport.[3, 4, 5, 6]
- The immediate benignity, sometimes very impressive, despite the spectacular side of these traumas.

Although these traumas are an integral part of surgical emergencies, they are very rarely life-threatening, being limited to:

- Respiratory congestion, either by asphyxiation by a blood clot or by inhalation of a tooth fragment.
- The cataclysmic haemorrhage, massive by the plausible presence of a facial compound, rhinorrhea, fracture of the middle 1/3 of the face, not causing major collapse despite their abundance; except for the possibility of internal bleeding, the research of which is not negligible at first glance
- Associated lesions, for example, damage to the cervical spine, cerebral contusion, etc. [7, 8, 9]

The objectives of our work will be essential:

- The study of the prevalence of trauma occurring in adults.

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- The study of the distribution of trauma using different variables (circumstance of occurrence, treatment, type of trauma), depending on two factors, age and sex.

1. Material and method

1.1. Study objectives

The main objective of this retrospective study was to identify the epidemiological profile of traumatic emergencies in the emergency department and dental care consultations of the Ibn Rochd University Hospital in Casablanca.

The secondary objective having been to allow an analysis of the different types of maxillofacial trauma according to certain variables such as age and sex.

The tertiary objective has been to establish the levels and priorities that govern the therapy of facial trauma, as well as to highlight an accurate diagnosis common and / or specific to the various trauma.

1.2. Sampling

The parameters which governed the choice of our sample are the following indications:

- **Inclusion criteria**: Any adult patient aged 15 and over received urgently for facial trauma, having consented to be part of this investigation.
- **Exclusion criteria**: Even though a majority of the young population is primarily affected by facial trauma, children under 15 will not be included in our sample.
- **Sample size**: It is represented by a set of 200 patients who consulted during the year 2018 (from 01/01/2018 to 31/12/2018).

1.3. Statistical method

They were the object of a computerized exploitation by means of software specialized in the treatment of statistical data “SPSS” and the functions of pivot tables of Microsoft Excel, which allowed us to obtain the results below.

2. Results

2.1. Distribution of trauma within the sample

- **Global results**: The study showed that a number of 197 adult patients between 15 and 70 years of age consulted for facial trauma during 2010, at a rate of 8,200 patients who all consulted the SCUD for emergencies; which represents a prevalence of 2.4%.

- **According to gender (Table 1)**
- **According to age (Table 2)**

2.2. Distribution of injuries according to the circumstances of occurrence

- **Global results (Table 3)**: The study showed that out of all 197 patients who consulted, the majority of traumas that occurred were distributed as follows:
  + Aggression is the cause of the trauma in 93 patients or 51.7%
  + The road accident is the cause of the trauma in 56 patients or 31.1%
  + Shock is the cause of trauma in 26 patients or 14.4%
  + The fall is the cause of the trauma in 18 patients or 10%
  + The work accident is the cause of the trauma in 4 patients or 2.2%.

2.3. Distribution of trauma according to the radiographic examination indicated

- **Global results (Table 4)**: Out of all 197 patients who consulted, it turned out that panning is used regularly, even systematically during any trauma, knowing that:
  + Use of panoramic only in 37.56% of cases.
  + Use of panoramic associated with retro-alveolar in 36.55% of cases.
  + Single use of the retro-alveolar in 25.38% of cases.

Knowing that the use of radiography has been indicated predominantly in males, including:

  + The indication amounts to 79.70% of male patients
  + The indication is 20.30% of female patients.

2.4. Breakdown of trauma by type of trauma

- **Global results (Table 5)**: The breakdown revealed the presence of:
  + 56.85% of dentoalveolar trauma.
  + 20.81% trauma to the bone bases.
  + 14.21% dental trauma.
  + 4.57% of dentoalveolar trauma and associated bone bases.
  + 2.03% of alveolar trauma
  + 1.02% of soft tissue lesions
  + 1 case of ATM dislocation.

2.5. Distribution of trauma according to the number of traumatized teeth

- **Global results (Table 6)**: The breakdown revealed the presence of:
  + In 23.86% of cases, the number of teeth affected is 2 teeth.
  + In 16.24% of cases, the number of teeth affected is 4 teeth.
  + In 12.18% of cases, the number of teeth affected is 3 teeth.
  + In 13.71% of cases, the number of affected teeth is one tooth.
  + In 4.57% of cases, the number of teeth affected is 6 teeth.
  + In 2.54% of cases, the number of teeth affected is 5 teeth.
  + In 1.52% of cases, the number of teeth affected is 8 teeth.
  + In 1.02% of cases, the number of teeth affected is 7 teeth.
  + No tooth is affected in 24.37% of cases.
**Table 1** According to gender

| Sexe     | Effectif | %     |
|----------|----------|-------|
| Féminin  | 40       | 20,30%|
| Masculin | 157      | 79,70%|
| Total    | 197      | 100%  |

**Table 2** According to age

| Sexe      | Effectif | %     |
|-----------|----------|-------|
| [15-25]   | 93       | 47%   |
| [25-40]   | 63       | 32%   |
| [40-70]   | 26       | 13%   |
| Non précisé| 15      | 8%    |
| Total     | 197      | 100%  |

**Table 3** Distribution of injuries according to the circumstances of occurrence

| Circonstance de survenue | Effectif | %     |
|--------------------------|----------|-------|
| Accident de travail      | 4        | 2,2%  |
| Agression                | 93       | 51,7% |
| AVP                      | 56       | 31,1% |
| Choe                     | 26       | 14,4% |
| Chute                    | 18       | 10%   |
| Total                    | 197      | 100%  |

**Table 4** Distribution of trauma according to the radiological examination indicated

| Radiographie indiquée | %     |
|-----------------------|-------|
| Aucune                | 0,51% |
| Panoramique           | 37,56%|
| Panoramique et RA     | 36,55%|
| RA                    | 25,38%|
| Total                 | 100,00%|

**Table 5** Distribution of trauma by type of trauma

| Type de lésion                  | %     |
|---------------------------------|-------|
| Lésion des parties molles       | 1,02% |
| Luxation de l’ATM               | 0,51% |
| Trauma alvéolaire               | 2,03% |
| Trauma dentaire                 | 14,21%|
| Trauma dento alvéolaire         | 58,85%|
| Trauma dento alvéolaire et bases osseuses | 4,57% |
| Trauma des bases osseuses       | 20,81%|
| Total                           | 100,00%|
Table 6 Distribution of trauma according to the number of traumatized teeth.

| Nombre de dents traumatisées | %    |
|-----------------------------|------|
| 1 dent                      | 13.71% |
| 2 dents                     | 23.86% |
| 3 dents                     | 12.18% |
| 4 dents                     | 16.24% |
| 5 dents                     | 2.54%  |
| 6 dents                     | 4.57%  |
| 7 dents                     | 1.02%  |
| 8 dents                     | 1.52%  |
| aucune                      | 24.37% |
| Total                       | 100.00% |

2.6. Distribution of mandibular trauma

2.6.1. depending on the type of fracture

- **Global results**: (Table 7): The distribution described in Table 34 revealed the presence of:
  + The absence of a fracture in 58.38% of cases.
  + Fracture of the toothed portion in 28.43% of cases.
  + The double fracture occurs in 9.64% of cases.
  + The triple fracture occurs in 1.52% of cases.
  + ATM dislocation in 1.02% of cases.
  + Craniofacial disjunction was seen in 0.51% of cases, or only one case of the 197 patients who consulted.

2.6.2. Depending on the headquarters

- **Global results** (Table 8): The distribution described in Table 24 revealed:
  + The absence of a fracture in 58.38% of cases.
  + An alveolar fracture in 12.69% of cases.
  + A para-symphyseal fracture in 9.14% of cases.
  + An angular fracture in 5.58% of cases.
  + A double angular and symphyseal fracture in 5.08% of cases.
  + A symphyseal fracture in 3.55% of cases.
  + A double symphyseal and condylar fracture in 1.52% of cases.
  + A dislocation of the ATM in 1.02% of cases, or 2 patients
  + A single case of associated symphyseal and coronoid fracture.
  + Two cases of triple associated symphyseal, angular and condylar fractures.
  + A single case of triple associated angular, symphyseal, and coronoid fracture.
  + A single case of fracture of the ramus.
  + Only one case of maxillary fracture occurred during the study year.

2.7. Distribution of alveolar trauma

- **Global results**: (Table 9): The breakdown described in Table 27 revealed:
  + The absence of alveolar trauma in 42.64% consultant patients.
  + The presence of extrusion in 17.26% of consulting patients.
  + The presence of subluxation in 15.23% of consulting patients.
  + The presence of lateral dislocation in 12.18% of consulting patients.
  + The presence of expulsion in 10.15% of consulting patients.
  + The presence of intrusion in 2.03% of consulting patients.
  + The presence of a concussion case.

2.8. Distribution of dental trauma

- **Global results** (Table 10): The distribution described in Table 30 revealed:
  + The absence of dental trauma in 57.87% of patients.
  + The presence of coronary radicular fracture in 17.77% of patients.
  + The presence of coronary fracture in 16.75% of patients.
  + The presence of complicated coronary fracture in 4.06% of patients.
  + The presence of a crack in 1.02% of patients.
  + The presence of radicular fracture in 1.02% of patients.
  + The presence of enamel fracture in 1.52% of patients.

2.9. Breakdown of injuries according to their management

- **Global results** (Table 11): The distribution described in Table 33 makes it possible to note the achievement of:
  + Semi-rigid retention in 34.52% of consulting patients.
  + Bi-maxillary blockage in 20.80% of consulting patients.
  + Semi-rigid retention associated with a composite band in 10.16% of consulting patients.
  + Single maxillary blockage in 8.63% of consulting patients.
**Table 7** Distribution of mandibular trauma according to the type of fracture.

| LE TYPE DE FRACTURE                      | %  |
|-----------------------------------------|----|
| Absence                                 | 58,38% |
| Double fracture                         | 9,64%  |
| Disjonction cranio facial               | 0,51%  |
| Fracture de la portion dentée           | 28,43% |
| Fracture de la portion non dentée       | 0,51%  |
| Luxation de l’ATM                      | 1,02%  |
| Triple fracture                         | 1,52%  |
| Total                                   | 100,00% |

**Table 8** Distribution of mandibular trauma according to their site.

| Siège du trauma mand                      | %  |
|------------------------------------------|----|
| Alvéolaire                               | 12,69% |
| Angulaire                                | 5,58%  |
| Branche montante                         | 0,51%  |
| Maxillaire                               | 0,51%  |
| Para symphysaire                         | 9,14%  |
| Symphysaire                              | 3,55%  |
| Symphysaire et angulaire                 | 5,08%  |
| Symphysaire et condylienne               | 1,52%  |
| Symphysaire et coronoïde                 | 0,51%  |
| Symphysaire, angulaire et cond           | 1,02%  |
| Symphysaire, angulaire et coroné         | 0,51%  |
| Absence                                  | 58,38% |
| Luxation de l’ATM gauche                 | 1,02%  |
| Total                                    | 100,00% |

**Table 9** Distribution of alveolar trauma.

| Traumatisme alvéolaire                     | %  |
|-------------------------------------------|----|
| Absence                                   | 42,6%  |
| Concussion                                | 0,51%  |
| Expulsion                                 | 10,15% |
| Extrusion                                 | 17,26% |
| Intrusion                                 | 2,03%  |
| Luxation latérale                         | 12,18% |
| Subluxation                               | 14,72% |
| Subluxation sup                           | 0,51%  |
| Total                                     | 100,00% |

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Table 10 Distribution of dental trauma.

| Traumatisme dentaire                       | Total  |
|--------------------------------------------|--------|
| Absence                                   | 57,87% |
| Fêlure                                     | 1,02%  |
| Fracture amélope                           | 1,52%  |
| Fracture coronaire                         | 16,75% |
| Fracture coronaire compliquée              | 4,06%  |
| Fracture corono radiculaire                | 17,77% |
| Fracture radiculaire                       | 1,02%  |
| Total                                      | 100,00%|

Table 11 Breakdown of injuries according to their treatment.

| Somme des Effectifs                                    | %    |
|-------------------------------------------------------|------|
| Prise en charge                                       |      |
| Apéxification                                         | 3,05%|
| Abstention, alimentation molle et prescription médicale| 6,60%|
| Bandeau de composite                                  | 6,60%|
| Blocage bi maxillaire                                 | 20,81%|
| Blocage mono maxillaire                               | 8,63%|
| Certificat médical initial                            | 0,51%|
| Chirurgie maxillo faciale                             | 1,52%|
| Contention et bandeau de composite                     | 1,02%|
| Contention semi rigide                                | 34,52%|
| Contention semi rigide et bandeau de composite         | 9,14%|
| Extraction du fragment coronaire                      | 2,54%|
| Réduction manuelle, contention                         | 0,51%|
| Réimplantation contention                             | 4,06%|
| Réimplantation, contention et apéxification            | 0,51%|
| Total                                                  | 100,00%|
+ Abstention, soft diet and medical prescription in 6.60% of consulting patients.
+ Composite band in 6.60% of consulting patients.
+ Reimplantation and restraint in 4.06% of consulting patients.
+ Apexification in 3.05% of consulting patients.
+ Extraction of the coronary fragment in 2.54% of consulting patients.
+ Maxillofacial surgery in 2 patients, ie 1.02%.

2.10. Breakdown of injuries according to their complications
- Global results (Table 12): The breakdown described in Table 36 revealed:
  + The absence of complications, a sequel in 71.07% of consulting patients.
  + The lack of follow-up in 21.32% of consulting patients.
  + The presence of gingival inflammation in 4.57% of consulting patients.
  + The need for pathological follow-up in 2 patients, ie 1.02%.
  + The presence of suppurative cellulitis in 2 patients, ie 1.02%.
  + The presence of serous cellulitis in 1 patient.

3. Discussion
The results of this survey have the advantage of having been obtained from data collected in the dental consultation and emergency department in Casablanca. They are therefore representative of the local population as it is a structure consulted by the majority of adults who have suffered dental trauma.

3.1. Characteristics of the traumatized patient
3.1.1. Sex
The distribution by sex shows a strong male preponderance, knowing that at the level of our series of cases, we noted 157 patients, or 79.70 against 40 patients, or 20.30%, with a sex ratio of 3.9.

3.1.2. Age
The breakdown of our patients by age group has shown that the age group most involved in trauma is between 15 and 25 years old, representing a number of 93 patients, or 47%; it is followed by the age interval between 25 and 40 years, of which the number is 63 patients or 32%.
Our youngest patient is 15 years old, and the oldest is 70 years old.

3.1.3. The time elapsed between the date of the trauma and the date of consultation
It was noted during this analysis that the majority of patients consulted within 24 hours of the trauma (i.e. 76.65%), which demonstrates the awareness that is proportionately evident compared to previous years. However, we note all the same that 13.71% consulted in an interval of 1 to 3 days and 9.64% in a time greater than 4 days, figures which should also sound the alarm bells in the hope of reducing them to a minimum in the following years.

3.1.4. The place of the trauma
The podium is marked by three places which are largely highlighted in our study, the predominance of which goes to the public place either following an accident or aggression with 173 traumas to its credit (i.e. 88%), continued from home place of predilection for female traumas with a number of 20 traumas having occurred at its level (10%), finally the traumas having been suffered at work representing only 2% of the total.

3.1.5. The circumstances of the trauma
During this analysis, five etiologies emerged, the most frequent of which is aggression alone, representing a total of 93 traumatized (47.2%) knowing that the majority of aggressions of the female sex are of conjugal origin, followed by the AVP in 2nd place with a number of 56 cases (28.4%), in 3rd place it finds a shock with some 26 patients (13.2%).
Finally, in last place, we find with some 16 patients (9%) followed by work accidents in the number of 4 cases (2%).

3.2. Clinical study
3.2.1. Number of traumatized teeth
In total, 149 teeth are affected by traumatic lesions, namely 75.63% of our study, knowing that the maxilla is involved three times out of four compared to the mandible. This notion has also been found in the literature [10, 11, 12, 13] Dento-dental relationships are a predisposing or even aggravating factor.

3.2.2. Type of traumatized teeth
The anterosuperior sector is the most affected representing more than 42.64%, followed by an associated trauma of the anterosuperior and inferior sectors representing 12.7% of the whole. Because indeed, as described in the literature, there is a close relationship between trauma on the maxillary incisors and the presence of a significant overhang, knowing that the more important it is, the higher the risk [14, 15, 16, 17].

3.2.3. Radiographic study
For any type of trauma regardless of the etiology, the panoramic is systematic, The orthopantomogram is the basic examination for the mandible (isolated fractures), the CT scan for the facial 1/3 and the skull. We also note that the panoramic and retroalveolar association are most often complementary to the confirmation of a dentoalveolar diagnosis. [17, 18]

3.2.4. Suggestions and perspectives
It should be borne in mind that a dento-alveolar trauma must be assimilated in the diagnostic and therapeutic process to a trauma of the face where a hierarchization of the lesion assessment must make a priority search for signs of neurological damage that may involve life-threatening diagnosis such as unconsciousness, nosebleeds or otorrhagia [19, 19]. Dental trauma is often accompanied by damage to soft tissue and sometimes damage to bone tissue,[10,20] found associated with dental trauma lacerations (32%), edemas (8%), abrasions (7%) and contusions (6%) [21, 22].
The simple and precise questioning should report the circumstances of the accident. A careful exo-oral and endo-oral examination, an appropriate radiological examination should help for a precise diagnosis [23,24] When adequate emergency treatment must be considered, taking a photograph before and after the procedure is strongly recommended, for medico-legal purposes, as well as, systemically, the drafting of an initial medical certificate attesting to the emergency management [24].
Table 12 Distribution of injuries according to their complications.

| Complication, séquelle | Total |
|-----------------------|-------|
| Péricoronarite droite  | 0,51% |
| Absence               | 71,07%|
| Absence de suivi      | 21,32%|
| Cellulite séreuse      | 0,51% |
| Cellulite suppurée     | 1,02% |
| Inflammation gingivale | 3,55% |
| Inflammation gingivale qmt | 0,51% |
| Inflammation gingivale localisée 12 | 0,51% |
| suivi patho            | 1,02% |
| Total                  | 100,00%|

This document must specify the possible temporary incapacity (ITT) of the patient to work [9,11] or the period of absence of a child from school. Advice should be given for an appropriate diet and updating the vaccination record, particularly the tetanus vaccine [25,26].

It must be taken that most often, poly traumas occur at night most of the time, at times when liberal consulting rooms and emergencies themselves are not very available, hence the need for the establishment of permanence at these late hours in order to improve the prognosis of treatment.

The odontologist will be able to do prevention by raising awareness among technical staff in clubs and sports associations, as well as at the school level, especially concerning teachers (example of first steps: conservation of avulsed teeth; transport environments; measures prevention: wearing mouthguards) [17,27,28].

Conclusion

Affecting children, as well as adults with different evolutions and implications, dental and/or alveolar trauma, are frequent lesions motivating the consultation of a practitioner, often urgently, then collaboration between stomatologists or maxillofacial surgeons and dentists. The difficulty lies in the need for early diagnosis and treatment (sometimes impossible to obtain in the event of multiple trauma or removal from a specialist). However, it is also linked to the nature of the terrain: children, vital distress associated, mediocre oral state. Anyway, the evolution of these lesions is unpredictable and great restraint must be made, even in the event of apparent success, with the patient or his family. Considering the functional, cosmetic and financial implications in the event of treatment failure, the careful drafting of the initial medical certificate is of paramount importance. Furthermore, careful monitoring is essential: weekly at the start of treatment, and it will then last for several years.

All traumatic lesions of the face have significant aesthetic and functional repercussions and are best treated by the earliest possible and most complete management possible before the fractures heal.

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