PREVALENCE AND CORRELATES OF TRAUMATIC INJURIES TO THE PERMANENT TEETH

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ABSTRACT Permanent tooth trauma was studied from a population of 107 traumatized children, aged between 6 and 15 years, who were referred for dental trauma consultation and dental emergencies for 12 months. An interview of the parents, as well as a clinical and radiographic examination, were carried out in order to specify the circumstances, the location and the type of trauma suffered by the child. The results highlight:
- A trauma prevalence equal to 12.6%
- Male predominance is common to general traumatology.
- The high frequency of trauma between 9 to 12 years with a peak at the age of 10 years.
- The urgency of the dental traumaticisms.
- The high frequency of falls followed by road accidents.
- The predominance of the street as a place of occurrence of trauma.
- The high frequency of coronary fractures, dislocations and subluxations.
- The high frequency of trauma involving 2 teeth.
- The frequent localization at the level of the upper central incisors.
- The predominance of restorative treatments and restraints as emergency therapy.

KEYWORDS Trauma dental, Alveolar, Basal bone, Epidemiological investigation

Introduction Dental trauma in children and adolescents is a serious public health dental problem [1, 2, 3, 4, 5, 6], which may even exceed dental caries and periodontal disease [1 2, 4, 7]. Indeed, many studies have reported that the prevalence of trauma is variable and quite high. This seems to be influenced mainly by the type of population studied and the different age groups [2, 3, 8].

Also, these studies showed that boys, more than girls, were subject to trauma with a peak at 10 years old in permanent dentition and a peak of 3 to 4 years in temporary dentition [7]. The most frequently affected teeth during the trauma are the anterior teeth and, in particular, the maxillary incisors at the rate of 95% [9, 10, 11, 12, 13].

Dental trauma has a multifactorial character, and the most common etiologies are falls, road accidents (AVP), brawls and sports activities. [6, 13, 14, 15, 16]. Our present study is carried out at the dental consultation and emergency department of Casablanca and aims to determine:
- The prevalence of permanent tooth trauma in children aged 6 to 15 who are attending Casablanca’s dental consultation and emergency department.
- The circumstances of occurrence of trauma.
- The different types of trauma in permanent dentition.
- The number and type of teeth involved in the trauma.
- Therapy adopted urgently.
1. MATERIAL AND METHODS

1.1. TYPE OF THE SURVEY
The survey is a descriptive epidemiological survey.

- Survey: the study is based on a questionnaire to collect information that meets our objectives.
- Epidemiology: the study focuses on the prevalence of permanent tooth trauma in children aged 6 to 15 years.
- Transversal: the information collected corresponds to an instantaneous state.
- Descriptive: the study proposes to describe the collected data, as well as the possible associations between the traumatisms of the permanent teeth and the various parameters studied.

1.2. METHODOLOGY
The investigation was conducted according to the following sequence of work:

In order to be able to examine any traumatized child coming to consult at (SCUD), our presence was daily.

- In a first time:
  - We participate in the realization of the clinical examination of the child:
  - Exam exo buccal.
  - Endo oral examination.
  - Dental tests.
  - Very often, this examination must be completed by taking x-rays:
  - Intraoral and/or
  - Extraoral.

- In a second step: We collected the data (fill out the survey form) after having made the diagnosis and established the emergency treatment plan.

- In a 3rd time: The traumatized child is treated urgently by an emergency department practitioner.

- In a 4th time: The practitioner gives him an appointment for a specialized trauma consultation, which takes place each Friday morning at SCUD, and we attend.

1.3. STATISTICAL METHODS
The data collected was captured and analyzed using the statistical software epi info version 6.0 fr.

2. RESULTS

2.1. DESCRIPTION OF THE RESULTS

2.1.1. DISTRIBUTION OF TRAUMA WITHIN THE SAMPLE

2.1.1.1. Overall results
The survey revealed that among 850 patients aged 6 to 15 who had consulted with SCUD, 107 patients had consulted for oral trauma, a prevalence of 12.6%.

2.1.1.2. Breakdown by age group
For the 107 traumatized patients, the average age is 11.1 years with a standard deviation of 2.1 years, and the most represented age is 10 years. The distribution of the sample according to age was made according to 3 intervals, each defining a population: (Tab 1)

- 22 patients are aged between 6 and 9 years, i.e. 20.6%.
- 55 patients are between 9 and 12 years old, i.e. 51.4%.
- 30 patients are between 12 and 15 years old, i.e. 28%.

2.1.1.3. Distribution by sex
For the 107 traumatized patients, the distribution of the sample by sex is as follows: (Tab 1)

- 74 boys or 69.2% of cases.
- 33 girls or 30.8% of cases.

2.1.2. DISTRIBUTION OF TRAUMATISM ACCORDING TO THE PLACE OF TRAUMATISM

2.1.2.1. Overall results
The 107 trauma cases are distributed according to the location of the trauma as follows: (Tab 2)

- Trauma on the street is 61 cases or 57%.
- Trauma in the school is 18 cases or 16.8%.
- Injuries in the home are 17 cases or 15.9%.
- Traumatisms in a field of sport are 5 cases or 4.7%.
- Trauma in other places are 6 cases or 5.6%.

2.1.2.2. Breakdown by age group
The distribution of overall results by location of injury and age group is as follows: (Tab 3)

- At the street:
  - From 6 to 9 years old: +10 patients or 45.5%.
  - From 9 to 12 years old: +32 patients or 58.2%.
  - 12 to 15 years old: +19 patients or 63.4%.

- At school:
  - From 6 to 9 years old: +4 patients, 18.2%.
  - From 9 to 12 years old: +11 patients or 20%.
  - 12 to 15 years old: +3 patients or 10%.

- At home:
  - From 6 to 9 years old: +7 patients or 31.8%.
  - From 9 to 12 years old: +9 patients or 16.4%.
  - 12 to 15 years old: +1 patient is 3.3%.

- Sports field:
  - From 6 to 9 years old: +1 patient is 4.5%.
  - From 9 to 12 years old: +1 patient is 1.8%.
  - 12 to 15 years old: +3 patients or 10%.

- Other places:
  - From 6 to 9 years old: +No case recorded is 0%.
  - From 9 to 12 years old: +2 patients or 3.6%.
  - 12 to 15 years old: +4 patients or 13.3%.
### Table 1 Distribution of injuries by age group and sex.

| Sex  | Age       | 6-9 years | 9-12 years | 12-15 years | Total |
|------|-----------|-----------|------------|-------------|-------|
|      | N         | %         | N          | %           | N     | %   |
| Male | 11        | 50        | 39         | 70.9        | 24    | 80  | 74   | 69.2 |
| Female | 11   | 50        | 16         | 29.1        | 6     | 20  | 33   | 30.8 |
| Total | 22       | 20.6      | 55         | 51.4        | 30    | 28  | 107  | 100  |

### Table 2 Sample Distribution by Location of Trauma.

| Location of the trauma | N | % |
|------------------------|---|---|
| Rue                    | 61| 57|
| School                 | 18| 16.8|
| House                  | 17| 15.9|
| Sports field           | 5 | 4.7|
| Other                  | 6 | 5.6|
| Total                  | 107| 100|

### Table 3 Distribution of the location of injuries by age group.

| Location | Age | 6-9 years | 9-12 years | 12-15 years | Total |
|----------|-----|-----------|------------|-------------|-------|
|          | N   | %         | N          | %           | N     | %   |
| Rue      | 10  | 45.5      | 32         | 58.2        | 19    | 63.4 | 61   | 57   |
| School   | 4   | 18.2      | 11         | 20          | 3     | 10  | 18   | 16.8 |
| House    | 7   | 31.8      | 9          | 16.4        | 1     | 3.3 | 17   | 15.9 |
| Sports field | 1 | 4.5 | 1 | 1.8 | 3 | 10 | 5 | 4.7 |
| Other    | 0   | 0         | 2          | 3.6         | 4     | 13.3 | 6   | 5.6  |
| Total    | 22  | 20.6      | 55         | 51.4        | 30    | 28  | 107  | 100  |

### Table 4 Location of trauma by sex.

| Location | Sex | Male | Female | Total |
|----------|-----|------|--------|-------|
|          | N   | %    | N      | %     |
| Rue      | 41  | 55.4 | 20     | 60.6  | 61 | 57 |
| School   | 15  | 20.2 | 3      | 9.1   | 18 | 16.8 |
| House    | 8   | 10.8 | 9      | 27.3  | 17 | 15.9 |
| Sports field | 5 | 6.8 | 0 | 0 | 5 | 4.7 |
| Other    | 5   | 6.8  | 1      | 3     | 6  | 5.6 |
| Total    | 74  | 69.2 | 33     | 30.8  | 107 | 100 |

### Table 5 Distribution of the sample according to the circumstances of occurrence.

| Location of the trauma | N    | %    |
|------------------------|------|------|
| Falls                  | 36   | 33.6 |
| Road accidents         | 20   | 18.7 |
| Accident at home       | 15   | 14   |
| Rixes                  | 15   | 14   |
| Accident at school     | 16   | 15   |
| Sports Activities      | 5    | 4.7  |
| Total                  | 107  | 100  |
2.1.2.3. Distribution by sex
The distribution of overall results by location of trauma and sex is as follows: (Tab 4)
- 61 patients suffered trauma on the street:
  - Male: 41 patients or 55.4%.
  - Female sex: 20 patients or 60.6%.
- 18 patients suffered trauma at school:
  - Male: 15 patients or 20.2%.
  - Female sex: 3 patients, ie 9.1%.
- 17 patients suffered trauma at home:
  - Male: 8 patients or 10.8%.
  - Female sex: 9 patients or 27.3%.
- 5 patients suffered trauma at the sports field:
  - Male: 5 patients or 6.8%.
  - Female sex: 0 patient is 0%.
- 6 patients in other places:
  - Male: 5 patients or 6.8%.
  - Female sex: 1 patient is 3%.

2.1.3. DISTRIBUTION OF TRAUMA IN ACCORDANCE WITH CIRCUMSTANCES OF SURGERY
2.1.3.1. Overall results
Out of 107 trauma cases, the distribution according to the circumstances of occurrence is as follows: (Tab 5)
- Trauma due to falls: 36 cases or 33.6%.
- Trauma injuries due to road accidents: 20 cases, i.e. 18.7%.
- Injury injuries at home: 15 cases, or 14%.
- Trauma caused by brawls: 15 cases, or 14%.
- Accidents caused by accidents at school: 16 cases, or 15%.
- Trauma caused by sports activities: 5 cases, i.e. 4.7%.

2.1.3.2. Breakdown by age group
The distribution of the overall results according to the circumstances of the occurrence and the age groups is as follows: (Tab 6)
- Falls:
  - From 6 to 9 years old: +5 patients or 22.7%.
  - From 9 to 12 years old: +19 patients, or 34.6%.
  - 12 to 15 years old: +12 patients or 40%.
- Accident on the public highway:
  - From 6 to 9 years old: +5 patients or 22.7%.
  - From 9 to 12 years old: +10 patients or 18.2%.
  - 12 to 15 years old: +5 patients or 16.7%.
- Accident at home:
  - From 6 to 9 years old: +6 patients or 27.2%.
  - From 9 to 12 years old: +8 patients or 14.5%.
- 12 to 15 years old: +1 patient is 3.3%.
- Rixes:
  - From 6 to 9 years old: +1 patient is 4.6%.
  - From 9 to 12 years old: +8 patients or 14.5%.
  - 12 to 15 years old: +6 patients or 20%.
- Accident at school:
  - From 6 to 9 years old: +4 patients, 18.2%
  - From 9 to 12 years old: +9 patients or 16.4%.
  - 12 to 15 years old: +3 patients or 10%.
- Sports activities:
  - From 6 to 9 years old: +1 patient is 4.6%.
  - From 9 to 12 years old: +1 patient is 1.8%.
  - 12 to 15 years old: +3 patients or 10%.

2.1.3.3. Distribution by sex
The distribution of the overall results according to the circumstances of occurrence and sex is as follows: (Tab7)
- 36 patients who suffered trauma due to falls:
  + Male: 28 patients or 37.8%.
  + Female sex: 8 patients or 24.2%.
- 20 patients who suffered trauma from road accidents:
  + male: 11 patients or 14.9%.
  + Female sex: 9 patients or 27.3%.
- 15 patients who suffered injuries from home accidents:
  + Male: 8 patients or 10.8%.
  + Female sex: 7 patients, ie 21.2%.
- 15 patients with trauma due to brawls:
  + Male: 9 patients, ie 12.2%.
  + Female sex: 6 patients, ie 18.2%.
- 16 patients who suffered accident injuries at school:
  + Male: 13 patients or 17.6%.
  + Female sex: 3 patients, ie 9.1%.
- 5 patients who suffered sports injuries:
  + Male: 5 patients or 6.7%.
  + Female sex: 0 patient is 0%.
Table 6 Distribution of circumstances of occurrence by slice age.

| Age                  | Occurrences of occurrence | 6-9 years | N   | %   | 9-12 years | N   | %   | 12-15 years | N   | %   | Total | N   | %   |
|----------------------|---------------------------|-----------|-----|-----|------------|-----|-----|-------------|-----|-----|-------|-----|-----|
| Falls                |                           |           | 5   | 22.7| 19         | 34.6| 12  | 40          | 36  | 33.6|       | 88  | 33.6|
| Road accidents       |                           |           | 5   | 22.7| 10         | 18.2| 5   | 16.7        | 20  | 18.7|       | 30  | 18.7|
| Accident at home     |                           |           | 6   | 27.2| 8          | 14.5| 1   | 3.3         | 15  | 14  |       | 18  | 14  |
| Rixes                |                           |           | 1   | 4.6 | 8          | 14.5| 6   | 20          | 15  | 14  |       | 15  | 14  |
| Accident at school   |                           |           | 4   | 18.2| 9          | 16.4| 3   | 10          | 16  | 14  |       | 16  | 14  |
| Sports Activities    |                           |           | 1   | 4.6 | 1          | 1.8 | 3   | 10          | 5   | 4.7 |       | 3   | 4.7 |
| Total                |                           |           | 22  | 20.6| 55         | 51.4| 30  | 28          | 107 | 100 |       | 107 | 100 |

Table 7 Distribution of circumstances of occurrence by sex.

| Sex       | Male       | Female    | Total |
|-----------|------------|-----------|-------|
|           | Occurrences of occurrence | N   | %   | N   | %   | N   | %   |
| Falls     | 28         | 37.8      | 8     | 24.2| 36  | 33.6|
| Road accidents | 11       | 14.9      | 9     | 27.3| 20  | 18.7|
| Accident at home | 8        | 10.8      | 7     | 21.2| 15  | 14  |
| Rixes     | 9          | 12.2      | 6     | 18.2| 15  | 14  |
| Accident at school | 13       | 17.6      | 3     | 9.1 | 16  | 15  |
| Sports Activities | 5        | 6.7       | 0     | 0   | 5   | 4.7 |
| Total     | 74         | 69.2      | 33    | 30.8| 107 | 100 |

Table 8 Distribution of injuries according to the type of traumatized teeth.

| Type of teeth   | N   | %   |
|-----------------|-----|-----|
| Upper central incisors | 168 | 68  |
| Lower central incisors | 42  | 17  |
| Higher canines   | 6   | 2.5 |
| Upper premolars  | 3   | 1.2 |
| Upper molar      | 1   | 0.4 |
| Lower central incisors | 10  | 4   |
| Lower lateral incisors | 6   | 2.5 |
| Lower canines    | 4   | 1.6 |
| Lower premolars  | 6   | 2.4 |
| Lower molar      | 1   | 0.4 |
| Total            | 247 | 100 |

Table 9 Overall distribution of different types of trauma.

| Type of trauma               | N   | %   |
|------------------------------|-----|-----|
| Trauma to hard tissue 1      | 141 | 46.2|
| Traumatism of periodontal tissues | 155 | 50.8|
| Alveolar trauma              | 7   | 2.3 |
| Bone trauma                  | 2   | 0.7 |
| Total                        | 305 | 100 |
2.1.4. DISTRIBUTION OF TRAUMATISMS BY TYPE OF TRAUMATIZED TOOTH
Out of 107 trauma cases we found 247 traumatized teeth, the distribution according to their type is as follows: (Tab 8)

- 168 upper central incisors suffered trauma, or 68%.
- 42 upper lateral incisors suffered trauma, 17%.
- 10 lower central incisors suffered trauma, ie 4%.
- 6 lower lateral incisors suffered trauma, or 2.5%.
- 6 higher canines experienced trauma, 2.5%.
- 4 lower canines experienced trauma, 1.6%.
- 3 upper premolars had a trauma of 1.2%.
- 6 lower premolars experienced trauma, 2.4%.
- 1 upper molar suffered trauma, or 0.4%.
- 1 lower molar suffered trauma, or 0.4%.

2.1.5. DISTRIBUTION OF TRAUMATISM ACCORDING TO THE RADIOGRAPHIC EXAMINATION INDICATED
Out of 107 trauma cases, the distribution according to the X-ray examination indicated is as follows (Tab 9):

- The retro alveolar was indicated in 94 cases, a prevalence of 87.9%.
- Panoramic X-ray was indicated in 3 cases, a prevalence of 2.8%.
- Occlusal bite was reported in 1 case, a prevalence of 0.9%.
- The combination of retro-alveolar and panoramic was indicated in 6 cases, a prevalence of 5.6%.
- Retro-alveolar association and the occlusal bite was reported in 3 cases, a prevalence of 2.8%.

2.1.6. SAMPLE DISTRIBUTION BY TYPE OF LESIONS
2.1.6.1. Overall results
Out of 107 trauma cases, we found 305 traumatic injuries, including (Tab 10)

- 141 trauma involving the hard tissues of the tooth, i.e. 46.2%.

The distribution of the overall results according to the different types of the trauma of the hard tissue of the tooth is as follows: (Tab 10)

- Cracks in 2 cases, 0.7%.
- Enamel fractures in 9 cases, 2.9%.
- Simple enamel fractures 87 cases, 28.5%.
- Complicated dento-dental fractures in 29 cases, i.e. 9.5%.
- Simple corono-radicular fractures in 1 case, i.e. 0.3%.
- Complicated corono-radicular fractures in 7 cases, i.e. 2.3%.
- Radicular fractures in 6 cases, 2
- 155 trauma related to periodontal tissues, i.e. 50.8%.

The distribution of the overall results according to the different types of periodontal tissue trauma is as follows: (Tab 11)

- Concussion in the number of 3 cases, 1%.
- Subluxation number 39, or 12.8%.
- Extrusion in the number of 20 cases, i.e. 6.5%.
- Lateral dislocation in the number of 44 cases, i.e. 14.4%.
- Intrusion in the number of 17 cases, i.e. 5.6%.
- Expulsion in 32 cases, i.e. 10.5%.
- 7 alveolar traumas, or 2.3%.
- 2 traumas concerning the bone tissue, i.e. 0.7%.

2.1.6.2. Distribution of trauma types by age
The distribution of overall results by type of injury and age group is as follows: (Tab 12)

- Trauma to the hard tissue of the tooth
  - From 6 to 9 years old: +17 lesions or 5.5%.
  - From 9 to 12 years old: +70 lesions or 23%.
  - 12 to 15 years old: +54 lesions or 17.7%.
- Periodontal tissue trauma
  - From 6 to 9 years old: +26 lesions or 8.5%.
  - From 9 to 12 years old: +70 lesions or 23%.
  - 12 to 15 years old: +59 lesions or 19.3%.
- Alveolar fractures
  - From 6 to 9 years old: +2 alveolar fractures or 0.65%.
  - From 9 to 12 years old: +3 alveolar fractures or 1%.
  - 12 to 15 years old: +2 alveolar fractures or 0.65%.
- Bone fractures
  - From 6 to 9 years old: +No bone fracture is observed in this age group or 0%.
  - From 9 to 12 years old: +No bone fracture is observed in this age group or 0%.
  - 12 to 15 years old: +2 bone fractures, 0.7%

2.1.6.3. Distribution of types of trauma by sex
The distribution of overall results by type of lesion and sex is as follows: (Tab 13)

- Trauma to the hard tissue of the tooth
  - Male: 98 lesions or 32.1%.
  - Female sex: 43 lesions or 14.1%.
- Periodontal tissue trauma
  - Male: 113 lesions or 37%.
  - Female sex: 42 lesions or 13.8%.
- Alveolar fractures
  - Male: 4 alveolar fractures or 1.3%.
  - Female sex: 3 alveolar fractures or 1%.
- Bone fractures
  - Male: 2 bone fractures or 0.7%.
  - Females: 0 bone fractures or 0%.
Table 10 Distribution of the sample according to the different types of the trauma of the hard tissues of the tooth.

| Type of trauma                        | N   | %  |
|---------------------------------------|-----|----|
| Cracks                                | 2   | 0.7|
| Enamel fractures                      | 9   | 2.9|
| Simple enamel fractures               | 87  | 28.5|
| Complicated dento-dentinal fractures  | 29  | 9.5|
| Simple corono-root fractures          | 1   | 0.3|
| Complicated Corono-Radicular Fractures| 7   | 2.3|
| Root fractures                        | 6   | 2  |
| **TOTAL**                             | 141 | 46.2|

Table 11 Distribution of the sample according to the different types of periodontal tissue trauma.

| Type of trauma     | N   | %  |
|--------------------|-----|----|
| Extortion January  | 3   | 1  |
| Subluxations       | 39  | 12.8|
| Extrusions         | 20  | 6.5|
| Lateral dislocations| 44  | 14.4|
| Intrusions         | 17  | 5.6|
| Evictions          | 32  | 10.5|
| **Total**          | 155 | 50.8|

Table 12 Distribution of types of injuries by age group.

| Types of trauma                        | Age                        | 6-9 years | 9-12 years | 12-15 years | Total |
|----------------------------------------|----------------------------|-----------|------------|-------------|-------|
| Hard tissue of the tooth               | N                          | %         | N          | %           | N     | %     |
| Periodontal tissues                    | N                          | %         | N          | %           | N     | %     |
| Alveolar fractures                     | N                          | %         | N          | %           | N     | %     |
| Bone fractures                         | N                          | %         | N          | %           | N     | %     |
| **Total**                              | N                          | %         | N          | %           | N     | %     |

Table 13 Distribution of types of trauma by sex.

| Types of trauma                        | Sex       | Male | %  | Female | %  | Total | %  |
|----------------------------------------|-----------|------|----|--------|----|-------|----|
| Hard tissue of the tooth               | N         | %    | N  | %     | N  | %    |    |
| Periodontal tissues                    | N         | %    | N  | %     | N  | %    |    |
| Alveolar fractures                     | N         | %    | N  | %     | N  | %    |    |
| Bone fractures                         | N         | %    | N  | %     | N  | %    |    |
| **Total**                              | N         | %    | N  | %     | N  | %    |   
2.1.7. DISTRIBUTION OF TRAUMATISMS ACCORDING TO MANAGEMENT

2.1.7.1. Overall results
In 107 trauma cases, we noted 237 treatments performed, the distribution according to the support is as follows: (Tab 14)

- Composite headband is 84, or 35.5%.
- 58 semi rigid restraint, or 24.5%.
- Relocation to 17, or 7.1%.
- Surgical repositioning of 16, or 6.7%.
- Reduction by digital pressure to the number of 16, or 6.7%.
- Apexification of 15, or 6.3%. Pulpectomy associated with calcium hydroxide 15, or 6.3%.
- Direct styling numbering 6, or 2.5%.
- Collage of the fragment to 4, or 1.7%.
- Direct styling numbering 2, 1.7%.
- Extraction in 2 cases, ie 0.9%.

Partial pulpotomy in 2 cases, i.e. 0.9%. Cervical pulpotomy in no case.

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

3.1. CHARACTERISTICS OF THE TRAUMATITIS PATIENT

3.1.1. Sex
Our study shows that trauma affects the male and female sex quite unequally. Boys are indeed twice as affected as girls.

\[ \frac{M}{F} \text{ ratio } = 2.24 \]

This is probably related to the more violent games practiced by boys. In addition, boys spend more time outside the home than girls and are more exposed to trauma. This difference between the two sexes has been found by many authors. [6, 7, 17, 18, 19, 20, 21] (Tab 20).

However, in other studies, there is almost equality between the two sexes, with a slight male predominance:

- A study conducted by Tovo MF et al. [18] porting 206 traumatized aged 8 to 10 years in Canoas in Brazil.
- Another study by Agbelusi G.A. et al. [19, 20, 21, 22] involved 157 traumatized 12-year-olds in Lagos State, Nigeria [23, 24, 25, 26].

3.1.2. Age
According to the statistical results, we find that the age group of 9 to 12 years and especially the children of 10 years are the most affected by the trauma. This is a time of intense activity that sometimes results in accidents due to sports activities, road, school, and fights. This result is confirmed by many authors. [7, 13, 16] (Tab 16).

3.1.3. The time elapsed between the date of the trauma and the date of consultation
The delay between the onset of the trauma and consultation is a decisive factor in the majority of cases, and it is a factor that will guide the therapeutic decision and condition the prognosis.

In our series, 63.6% of patients consult between the first and seventh day after the trauma and are taken care of the day of the consultation. Our results agree with those of GABRIS K. et al. [33] conducted in Budapest, Hungary, and BENHAMADI A conducted in Casablanca, Morocco, which showed respectively that 74% and 49.3% of patients consult between the first and seventh day of the accident.

While those who consult immediately after the occurrence of the trauma are of the order of 15.9%, the value is quite high compared to that found by BENHAMADI A in 1997, which was 4.6%. This could be explained by:

- The creation of SCUD in February 2000, which contributed to improving the management of dental trauma.
- Awareness of students in schools, by distributing posters about Good reflexes to keep the smile. However, this result is not unanimous because ALTAY N. et al. [23] in Ankara, Turkey, found that the majority of patients, 48%, consult the same day of the trauma. Nevertheless, it is not uncommon for patients to consult much later.

Indeed, 10.3% of patients consult beyond one month. This can be explained either by:

- The lack of information on the complications that can lead to trauma
- Absence of signs of severity at the time of the trauma
- The realization of the first emergency action at home.

This result does not agree with the study conducted by Rajab L.D. [1] in Amman, Jordan, who found that 25.8% of trauma patients consult after a month. Moreover, ZUHAL K. et al. [13] in Isparta, Turkey, found that 38.8% of traumatized patients consult beyond 6 months.

3.1.4. The place where the trauma occurred
In our study, trauma occurs most often in the street at 57%, which could be explained by the time spent the child on the street playing with his classmates and the risk of accident (speeding, non-respect of the rules of the road...).

At school, as at home, accidents are fewer, 16.8% and 15.9%, respectively, and occur when children are more agitated. These results are consistent with ALTAY N. et al. [23] in Ankara, Turkey, conducted on 150 traumatized children aged 1 to 16, who showed that 45.3% of trauma occurs on the street, 30.7% at school, 19.3% at home. However, other authors have shown that the majority of traumas occur at home:

- BAUSS O. et al. [33, 34, 35, 36] in a study conducted in Geneva, Switzerland, on a sample of 141 traumatized patients, candidates for orthodontic treatment, presenting different age categories.
- GABRIS K. et al. [33, 34, 35] in a study conducted in Budapest, Hungary, on a sample of 547 traumatized patients aged 7 to 18 years.
- RAJAB L.D et al. [1] in a study conducted in Amman, Jordan, on a sample of 391 trauma patients aged 7 to 15 years.
Table 14 Distribution of the sample according to the treatment carried out.

| Treatments made                  | N  | %   |
|----------------------------------|----|-----|
| Bondeau of composite             | 84 | 35.5|
| Contention                       | 58 | 24.5|
| Relocation                       | 17 | 7.1 |
| Repositioning Surgical           | 16 | 6.7 |
| Manual repositioning             | 16 | 6.7 |
| Apexification                     | 15 | 6.3 |
| Pulpectomy                       | 15 | 6.3 |
| Direct styling                   | 6  | 2.5 |
| Collage of fragment              | 4  | 1.7 |
| Indirect styling                 | 2  | 0.9 |
| Partial Pulpotomy                | 2  | 0.9 |
| Extraction                       | 2  | 0.9 |
| **Total**                        | 237| 100 |

Table 15 Bibliographic summary of trauma by sex.

| Authors                              | Year | Sample | Male    | Female  |
|--------------------------------------|------|--------|---------|---------|
| BENHAMADI A. (27, 28, 29, 30)        | 1997 | 150    | 62.7%   | 37.3%   |
| (Casablanca, Maroc)                  |      |        |         |         |
| CALDAS Jr A.F. et coll. (7)          | 2001 | 127    | 67.7%   | 32.3%   |
| (Recife, Brésil)                     |      |        |         |         |
| NICOLAU B. et coll. (6)              | 2001 | 133    | 66.9%   | 33.1%   |
| (Cianorte, Brésil)                   |      |        |         |         |
| NIK-HUSSEIN N.N. et coll. (9, 11)    | 2001 | 169    | 64.5%   | 35.5%   |
| (Kuala lumpur, Malaisie)             |      |        |         |         |
| ROCHA M.J.C. et coll. (25)           | 2001 | 36     | 61.1%   | 38.9%   |
| (Santa catarina, Brésil)             |      |        |         |         |
| RAJAB L.D. et coll. (1)              | 2003 | 391    | 64.2%   | 35.8%   |
| (Amman, Jordanie)                    |      |        |         |         |
| TAPIAS M.A. et coll. (5)             | 2003 | 82     | 67.1%   | 32.9%   |
| (Mostoles, Spain)                    |      |        |         |         |
| BAUSSO et coll. (17)                 | 2004 | 141    | 63.1%   | 36.9%   |
| (Genève, Suisse)                     |      |        |         |         |
| ZUHAL K. et coll. (13)               | 2005 | 317    | 64%     | 36%     |
| (Isparta, Turquie)                   |      |        |         |         |
| PRESENT STUDY                        | 2018 | 107    | 69.2%   | 30.8%   |
| (Casablanca, Maroc 2018)             |      |        |         |         |

Table 16 Bibliographic summary of trauma by age.

| Authors                              | Sample | Echantillon | Prevalence | Age Pic |
|--------------------------------------|--------|-------------|------------|---------|
| UJI et coll. (7)                     | 1988   | 15822       | 21.8%      | 6-12    |
| (Japon)                              |        |             |            |         |
| CRONA-LARSSON et coll. (7)           | 1989   | 108         |            | 10      |
| (Suède)                              |        |             |            |         |
| DELATTRE et coll. (7)                | 1995   | 2020        | 13.6%      | 12      |
| (France)                             |        |             |            |         |
| PETTI et COLL (7)                    | 1996   | 824         | 20.26%     | 9       |
| (Italie)                             |        |             |            |         |
| BENHAMADI A. (27, 28, 30)            | 1997   | 150         |            | 9-12    |
| (Casablanca, Maroc)                  |        |             |            |         |
| MARCENES et coll. (7)                | 1999   | 1087        | 33.2%      | 11      |
| (Syrie)                              |        |             |            |         |
| SANDALLI N. et coll. (16)            | 2005   | 91          |            | 6-11    |
| (Turquie; Istanbul)                  |        |             |            |         |
| ZUHAL K. et coll. (13)               | 2005   | 514         |            | 9-11    |
| (Turquie; Isparta)                   |        |             |            |         |
| PRESENT STUDY                        | 2006   | 107         | 12.6%      | 10      |
| (Casablanca, Maroc 2018)             |        |             |            |         |
Table 17 Bibliographic summary of traumas according to the circumstances of occurrence.

| Authors                 | Falls | AVP  | Rixes | Sports | Other |
|-------------------------|-------|------|-------|--------|-------|
| BENHAMADI [39]          | 66%   | 15.34% | 6.66% | 4%     | 8%    |
| Trashy K. et coll. [33, 35, 36] (Budapest, Hongrie2001) | 12% | 7% | 3% | 29% | 49% |
| NICOLAU B. et coll. [39] (Cianorte, Brésil 2003) | 24.1% | 10.5% | 16.5% | 2.3% | 46.6% |
| SARUGLU L. et coll. [39] (Ankara, Turquie 2002) | 65.35% | 4.72% | 2.36% | 3.95% | 14.15% |
| CANAKCI V. et coll. [38] (Erzurum, Turquie 2003) | 27.7% | 11.3% | 24% | 18.8% | 18.2% |
| TAPIAS M.A. et coll. [5] (Mostoles, Espagne 2003) | 43.9% | 6.1% | 9.8% | 12.2% | 28% |
| TRAEBERT J. et coll. [37] (Florianópolis, Brésil 2003) | 47.9% | 2.1% | 37.5% | 12.5% |
| BAUSS O. et coll. [17] (Genève, Suisse 2004) | 49.6% | 17% | 14.2% | 14.2% | 5% |
| SANDALLI N. et coll. [16] (Istanbul, Turquie 2005) | 84% | 6% | | |
| ZUHAL K. et coll. [13] (Isparta, Turuie 2005) | 47.6% | 3.4% | 23.7% | 3.8% | 21.5% |
| PRESENT STUDY (Casablanca, Maroc 2018) | 33.6% | 18.7% | 14% | 4.7% | 29% |

- TRAEBERT J. et al. [37] in a study conducted in Florianópolis, Brazil, on a sample of 307 trauma patients aged 12 years.

3.1.5. The circumstances of the occurrence of the trauma

According to our study, the circumstances of the trauma are ranked in descending order of frequency, in falls and assaults which constitute 33.6%, road accidents 18.7%, accidents at school 15%, home accidents and brawls 14% each.

Falls, bike falls, the descent of sidewalks, tiling, slipping, etc., are responsible for the greater frequency of dental trauma in children consulting the dental consultation and emergency department. AVPs also constitute a considerable aetiology of dental trauma. This is explained by their general severe consequences (fracture of a limb, maxillofacial fracture) and dental (expulsion, root fractures, alveolar fracture), and because of this, the parents consult the SCUD after the hospitalization in specialized units.

We quote below the results of some studies [5, 6, 13, 16, 17, 33, 36, 37, 38, 39]: (Tab 17)

3.2. CLINICAL DATA

3.2.1. Alveolar trauma
According to our study, there are 7 fractures in the alveolar trauma, i.e. 2.2% of all the diagnosed lesions. Our results agree with SANDALLI N et al. [16] in a study conducted in Istanbul, Turkey in 2005, with BENHAMADI A [27, 30] in a study conducted in Casablanca, Morocco in 1997, reporting respectively 4.3% and 2.56% of alveolar fractures.

3.2.2. Bone trauma
According to our study, bone trauma is the least represented category. They occupy 0.7% of all diagnosed lesions. Our results agree with those of BENHAMADI A [27, 29, 30] in a study conducted in Casablanca, Morocco, in 1997, reporting 0.98% of bone fractures. However, in the literature, few studies have reported the association of traumatic alveolo-dental and bone:

- GASSNER R et al. [43, 44, 45, 46], Innsbruck.Austria recorded in 2003 a percentage of 7.1%.

- GASSNER R et al. [47], Innsbruck, Austria, reported in another study in 1999 the percentage of 13.7%.

- Da-SILVA AC et al. [48], Piracica braz. Brazil raised the percentage by 13.46%.

3.3. RADIOGRAPHIC STUDY

In our study, radiographic examination was indicated for all traumatized patients. The retro-alveolar was indicated at 87.8%. This result is explained by the often isolated nature of the trauma affecting one or two teeth in the majority of cases and localized at the level of the incisors, and by the precision of the information, which can provide, to complete the establishment of the diagnosis, comes then the association of the retro-alveolar and the panoramic at a rate of 5.6%, and the panoramic only at 2.8%. This last result could be explained by the failure of the panoramic radiography during 4 months of our investigation and by the limited indications in the case of isolated traumas.

3.4. SUPPORTED

According to our statistical study, conservative treatment (restorative and pulp) is the first step in our therapeutic approach. This is related to the high frequency of simple and complicated dento-dentinal fractures. Medical treatment plays an important role in our therapeutic behaviour because of the frequency of periodontal tissue trauma and the pulpal complications of trauma.

These results agree with many authors:
- CORTES MIS. et al. (26), Belo horizonte, Brazil.
- RAJAB LD. (1), Amman, Jordan
- GABRIS K. et al. (33, 35, 36), Budapest, Hungary.
- AL-MAJED I. et al. (40), Riyadh, Saudi Arabia.
- KARGUL B. et al. (44, 45, 46), Istanbul, Turkey.
- GAYE F. et al. (16), Dakar, Senegal.
- AGBELUSI GA. et al. (19, 21, 22), Lagos Nigeria.
- ZUHAL K, et al. (13, 14), Isparta, Turkey
- SANDALLI N. et al. (16), Istanbul, Turkey.
Table 18: Bibliographic synthesis of studies according to trauma of hard and periodontal tissues.

| Exp | 4,7% | 9,2% | 4,39% | 9% | 3,6% | 7,1% | 7,1% | 0,6% | 12% | 10,5% |
| Intr | 2,57% | 6,2% | 1,5% | 1,5% | 2,5% | 2,7% | 0,3% | 2,2% | 5,6% |
| LL | 0,6% | 0,7% | 16,6% | 2% | 4,8% | 3,3% | 2,1% | 1,2% | 14,4% |
| Extr | 3,95% | 6,7% | 3% | 3% | 2,04% | 1,3% | | | 6,55% |
| Sub | 22,9% | 13,3% | 4% | 5,3% | 47,9% | 0,62% | 16,9% | | | 12,8% |
| Cc | 16,4% | | 1% | 3,3% | 19% | 31,8% | | | 1% |
| FR | 1,9% | 6,2% | 0,8% | 2,8% | 2% | 5,3% | 1,3% | 1,2% | | 1,96% |
| FCRC | 1,4% | 4,1% | | 0,5% | | | | | | 2,3% |
| FCRS | 0,6% | 2,1% | | 0,5% | 1,5% | | 0,7% | | | 0,3% |
| FADC | 9,8% | 10,2% | 4,9% | | 16% | 4,1% | 11,8% | 2,6% | 12% | 9,5% |
| FADS | 18,9% | 29,2% | 48,7% | 37,8% | 50,5% | 59,7% | 28,1% | 18,2% | 20,2% | 28,5% |
| FA | 6,1% | 24,5% | | 7% | | 36% | 17,4% | | | 2,9% |
| Fêl | 6,32% | 5,1% | | | | | | 6,1% | 6% | 37,3% | 0,65% |

Authors

- BENHAMADI A (7) (Casablanca, Maroc 1997)
- ALTAY N et coll. (4) (Ankara, Turquie 2001)
- GABRIS K et coll. (13) (Budapest, Hongrie 2001)
- SARIOLU et coll. (27) (Ankara, Turquie 2002)
- CANAKCI et coll. (9) (Erzurum, Turquie 2003)
- GASSNER R et coll. (15) (Innsbruck, Autriche 2003)
- KARGUL P et coll. (19) (Istanbul, Turquie 2003)
- SKAARE A.B et coll. (28) (Oslo, Norvège 2003)
- SANDALLI N et coll. (26) (Istanbul, Turquie 2005)
- PRESENT STUDY (Casablanca Maroc 2006)
CONCLUSION
This study included 107 children between the ages of 6 and 15 years, consulting the Dental Consultative and Emergency Department (SCUD) for dental trauma:

- A clear male predominance common to general traumatology: 69.2% of the male compared to 30.8% of the female sex.
- The urgency of dental trauma since 61.5% of patients consult after recent trauma within 1 to 7 days.
- Among the etiologies, a majority of falls and accidents on public roads.
- The high frequency of accidents on the street is at 57%.
- Periodontal tissue trauma 51.6% is more common than hard tissue trauma 45.5%, while alveolar and bone trauma is rarer 2.2% and 0.7% respectively.
- Coronary fractures, especially dentine fractures, subluxations and lateral dislocations, are the most common traumatic lesions.
- In trauma, the most affected teeth are the upper central incisors 68%, while other types of teeth are slightly affected.

This study emphasizes the need for a preventive education program directed at parents and teachers. This would help inform them of the problems caused by dental trauma, the need for immediate post-traumatic care and regular follow-up that determine the success of most of the therapies used.

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