PERMANENT TOOTH TRAUMA (Epidemiological survey)

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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 a period of 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 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 traumatisms.
-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.

MESH : Trauma dental, Alveolar, Basal bone, Epidémiological 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 and this seems to be influenced mainly by the type of the population studied and the different age groups **(2, 3, 8).**

Also, these studies also 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, 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 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 ENVIRONMENT OF THE SURVEY

The survey was conducted in the Dental Consultative and Emergency Department (SCUD) which is part of the Center for Consultation and Dental Treatment (CCTD) of the Ibn Rochd University Hospital Center (CHU), Casablanca, Morocco.

This structure consists of 4 units:

-A care unit: 5 dental chairs for emergency care
-A consultation unit: 2 dental chairs
-A sterilization unit.
-A radiology unit.

1.3. TARGET POPULATION

Our study covers all children between the ages of 6 and 15, having first seen dental consultations and emergencies for trauma to permanent teeth.

1.4. SUPPORT OF THE SURVEY

1.4.1. SURVEY SHEET

Based on a detailed card prepared by Casablanca's dental consultation and emergency department, we have designed a more developed data collection form. It contains 6 pages written in French.
This form has 6 parts:

-General information about the traumatized child.
-Anamnesis of the traumatized.
-Clinical examination with 2 components:
+ exo oral exam
+ endo-oral examination
- X-ray examination, this part determines the type of radiography taken and is divided into 2 volutes:
+Radiographic examination of dental structures

+X-ray examination of bone structures

-The fifth part of the questionnaire concerns the diagnosis. It includes the different types of dental and periodontal trauma, specifying the number of the tooth concerned, according to the classification established by the WHO and modified by Andreasen (see appendix 2).

-The last part of the form concerns the treatment plan. It contains the different emergency treatments in case of dento-alveolar trauma.

1.4.2. VARIABLES USED

-Sociodemographic variables:

+Quantitative variables such as age, which is given in number of years.

+Qualitative variables such as sex (male, female), place of residence (urban or rural) and socio-economic level coded as follows:

-High: senior officials and liberal executives and large traders

-Middle: officials and employees, small and medium traders.

-Below: without professions, temporary, declared or integrated workers or farmers, craftsmen and others.

-Variables concerning the trauma:

+The time elapsed between the trauma and the date of the first consultation.
+The place of the trauma.
+The circumstances of occurrence.
+Signs of head trauma.
+The medical condition.
+The type of trauma.
+What to do.

1.5. METHODOLOGY

1.5.1. CALENDAR OF OPERATIONS

-Realization of calibration or pre-investigation of 10 cases.
-Realization of the survey itself (data collection for one year)
-Statistical processing of data.
-Interpretation of the results.

1.5.2. PRE INVESTIGATION

During this phase, we were able to familiarize ourselves with the details of the survey and refine our approach regarding the different variables that make up the form.

This is an essential step in the smooth running of the investigation, which lasted a month during which we were able to fill 10 survey cards.

1.5.3. CONDUCT OF THE SURVEY

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:
-Intra oral and / or

-Extra oral.

-In a second step:
We collect 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 which we attend.

1.5.4. DIFFICULTIES AND BIAS

In this survey; we were faced with a number of problems.

Recruitment problems of traumatized patients:

-Our investigation lasted 12 months, during which we recruited 107 traumatized children between 6 and 15 years of age with permanent tooth trauma.

Factors that had to limit the number of trauma cases:

-The socio-economic level, which is often low, hinders care.

-The lack or even the lack of awareness of the child's entourage with regard to the severity of the trauma, indeed some patients consult just to have the initial medical certificate.

-The existence of other care structures for traumatized children.

Problems related to means and materials:

-The failure of the panoramic radiography, which lasted 4 months, at SCUD had delayed the establishment of the diagnosis.

-The unavailability of sterile equipment obliged the practitioner to postpone the act of urgency.

Difficulties in collecting accurate data:

-Limitation of mouth opening; pain ; Fear (psychological state) and swelling-related edema prevented smooth clinical, radiographic and emergency treatment.

-The hospitalization of the severely traumatized only allows the dental consultation after the disappearance of some signs of the trauma.

-The negligence and ignorance of some parents, lead to late consultations following complications.

-The lack of follow-up, once the emergency treatment has been completed.

1.6 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, 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, ie 20.6%.
-55 patients are between 9 and 12 years old, ie 51.4%.
-30 patients are between 12 and 15 years old, ie 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.

Age / Sex	**6-9** years		**9-12** years		**12-15** years		**Total**	
	N	**%**	**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 1 : Distribution of injuries by age group and sex.

2.1.1.4. Breakdown by socio-economic level

For the 107 traumatized patients, 3 socio-economic levels were taken into account: low, medium and high level. The distribution of the sample according to these 3 levels is as follows: **(Tab 2)**

-63 patients have a low level of 58.9%.
-42 patients have an average level of 39.2%.
-2 patients have a high level of 1.9%.

2.1.1.5. Breakdown by place of residence

For the 107 traumatized patients, the distribution of the sample by place of residence is as follows: **(Tab 3).**

-92 patients have a place of urban residence that is 86%.
-15 patients have a rural residence or 14%.

Socio-economic level	**N**	**%**
Netherlands	**63**	**58,9**
Middle	**42**	**39,2**
High	**2**	**1,9**
Total	**107**	**100**

Table 2: Distribution of the sample by socio-economic level.

Place of residence	N	%
Rural	15	14
Urban	92	86
Total	107	100

Table 3: Distribution of the sample by place of residence

2.1.2. DISTRIBUTION OF TRAUMATISM BASED ON TRAUMATIC HISTORY

2.1.2.1. Overall results

For the 107 trauma patients, the distribution of the sample according to the history of trauma is as follows: **(Tab 4)**

-5 patients had a trauma history of 4.7%.
-102 patients never had a history of trauma ie 95.3%.

History of trauma	N	%
Oui	5	4,7
Non	102	95,3
Total	107	100

Table 4: Distribution of the sample according to the history of trauma.

2.1.3. DISTRIBUTION OF TRAUMATISM BY TIME OUT

2.1.3.1. Overall results

Regarding the time elapsed between the moment of the accident and the day of the consultation, we found the following results: **(Tab 5)**

-17 patients had consulted the same day of the trauma, ie 15.9%.
-68 patients consulted between 1 and 7 days or 63.6%.
-11 patients consulted between one week and one month, ie 10.3%.
-10 patients consulted between one month and one year, ie 9.3%.
-1 patient had consulted beyond one year, ie 0.9%.

The elapsed time	N	%
The day of the accident	17	15,9
From 1 to 7 days	68	63,6
A week to a month	11	10,3
A month to a year	10	9,3

Beyond one year	**1**	**0,9**
Total	**107**	**100**

Table 5: Distribution of the sample according to the time elapsed.

2.1.3.2. Breakdown by age group

The distribution of overall results by elapsed time and age groups is as follows: **(Tab 6)**

The day of the accident:

-From 6 to 9 years old:
+2 patients or 9.1%.
-From 9 to 12 years old:
+9 patients or 16.4%.
-12 to 15 years old:
+6 patients or 20%.

1 day to 7 days

-From 6 to 9 years old:
+16 patients or 72.7%.
-From 9 to 12 years old:
+35 patients or 63.6%.
-12 to 15 years old:
+17 patients or 56.7%.

From 1 week to 1 month

-From 6 to 9 years old:
+3 patients or 13.6%.
-From 9 to 12 years old:
+4 patients or 7.3%.
-From 12 years to 15 years:
+4 patients or 13.3%.

From 1 month to a year

-From 6 to 9 years old:
+1 patient is 4.6%.
-From 9 to 12 years old:
+7 patients or 12.7%.
-12 to 15 years old:
+2 patients or 6.7%.

Beyond a year

-From 6 to 9 years old:
+No case recorded is 0%.
-From 9 to 12 years old:
+No registered cases are 0%.
-12 to 15 years old:
+1 patient is 3.3%.

Age / The elapsed time	6-9 years		9-12 years		12-15years		Total	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
The day of the accident	**2**	**9,1**	**9**	**16,4**	**6**	**20**	**17**	**15,9**

From 1 to 7 days	**16**	**72,7**	**35**	**63,6**	**17**	**56,7**	**68**	**63,6**
One week to one month	**3**	**13,6**	**4**	**7,3**	**4**	**13,3**	**11**	**10,3**
One month to one year	**1**	**4,6**	**7**	**12,7**	**2**	**6,7**	**10**	**9,3**
Beyond one year	**0**	**0**	**0**	**0**	**1**	**3,3**	**1**	**0,9**
Total	**22**	**20,6**	**55**	**51,4**	**30**	**28**	**107**	**100**

Table 6: Distribution of elapsed time by age group.

2.1.3.3. Distribution by sex

The distribution of overall results by elapsed time and sex is as follows: **(Tab 7)**

The day of the accident:

-Male: 13 patients or 17.6%.

-Female sex: 4 patients or 12.1%.

1 day to 7 days:

-Male: 46 patients or 62.2%.

-Female sex: 22 patients or 66.7%.

From 1 week to 1 month:

-Male: 9 patients, ie 12.2%.

-Female sex: 2 patients, ie 6.1%.

From 1 month to a year:

-Male: 5 patients or 6.7%.

-Female sex: 5 patients or 15.1%.

Beyond a year:

-Male: 1 patient is 1.3%.

-Female sex: 0 patient is 0%.

Sex / The elapsed time	Male		Female		Total	
	N	**%**	**N**	**%**	**N**	**%**
The day of the accident	**13**	**17,6**	**4**	**12,1**	**17**	**15 ,9**
From 1 to 7 days	**46**	**62,2**	**22**	**66,7**	**68**	**63,6**
One week to one month	**9**	**12,2**	**2**	**6,1**	**11**	**10,3**
One month to one year	**5**	**6,7**	**5**	**15,1**	**10**	**9,3**

Beyond one year	**1**	**1,3**	**0**	**0**	**1**	**0,9**
Total	**74**	**69,2**	**33**	**30,8**	**107**	**100**

Table 7: Distribution of time elapsed according to sex.

2.1.4. DISTRIBUTION OF TRAUMATISM ACCORDING TO THE PLACE OF TRAUMATISM

2.1.4.1. Overall results

The 107 trauma cases are distributed according to the location of the trauma as follows: **(Tab 8)**

-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%.

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 8: Sample Distribution by Location of Trauma

2.1.4.2. Breakdown by age group

The distribution of overall results by location of injury and age group is as follows: **(Tab 9)**

<u>At the street:</u>

-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%.

<u>At school:</u>

-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%.

Age / Location	6-9 years		9-12 years		12-15years		Total	
	N	%	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 9: Distribution of the location of injuries by age group.

2.1.4.3. Distribution by sex

The distribution of overall results by location of trauma and sex is as follows: **(Tab10)**

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%.

Sex / Location	Male		Female		Total	
	N	%	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 10: Location of trauma by sex.

2.1.5. DISTRIBUTION OF TRAUMA IN ACCORDANCE WITH CIRCUMSTANCES OF SURGERY

2.1.5.1. Overall results

Out of 107 trauma cases, the distribution according to the circumstances of occurrence is as follows: **(Tab 11)**

-Trauma due to falls: 36 cases or 33.6%.
-Trauma injuries due to road accidents: 20 cases, ie 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, ie 4.7%.

Occurrences of occurrence	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

Table 11: Distribution of the sample according to the circumstances of occurrence.

2.1.5.2. Breakdown by age group

The distribution of the overall results according to the circumstances of occurrence and the age groups is as follows: **(Tab12)**

-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%.

Occurrences of occurrence / Age	6-9 years		9-12 years		12-15 years		Total	
	N	%	N	%	N	%	N	%
Falls	5	22,7	19	34,6	12	40	36	33,6
Road accidents	5	22,7	10	18,2	5	16,7	20	18,7
Accident at home	6	27,2	8	14,5	1	3,3	15	14
Rixes	1	4,6	8	14,5	6	20	15	14
Accident at school	4	18,2	9	16,4	3	10	16	15
Sports Activities	1	4,6	1	1,8	3	10	5	4,7
Total	22	20,6	55	51,4	30	28	107	100

Table 12: Distribution of circumstances of occurrence by slice age.

2.1.5.3. Distribution by sex

The distribution of the overall results according to the circumstances of occurrence and sex is as follows: **(Tab13)**

-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%.

Occurrences of occurrence / Sexe	Male		Female		Total	
	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 13: Distribution of circumstances of occurrence by sex.

2.1.6. DISTRIBUTION OF TRAUMATISM BY SIGNS OF SKULL INJURY

2.1.6.1. Overall results

Out of 107 trauma cases, 30 patients have one or more signs of head trauma. **(Tab14)**

Presence of signs of head trauma	**N**	**%**
Non	**77**	**72**
Oui	**30**	**28**
Total	**107**	**100**

Table 14: Distribution according to the presence of signs of traumatic brain injury

2.1.6.2. Distribution according to signs of head trauma:

In 30 patients with head trauma, there were 57 signs of head trauma. The distribution according to these signs is as follows: **(Tab 15)**

-Headache in 27 cases, or 47.4%.
-Epistaxis in 11 cases, 19.3%.
-Loss of consciousness in the number of 10 cases, 17.5%.
-Disorder of sight in number of 8 cases, 14%.
-Vomiting in 1 case, or 1.8%.

Signs of head trauma	**N**	**%**
Headache	**27**	**47,4**
Epistaxis	**11**	**19,3**
Loss of consciousness	**10**	**17,5**
Trouble of sight	**8**	**14**
Vomiting	**1**	**1,8**

Total	**57**	**100**

Table 15: Distribution of the sample according to the signs of head trauma.

2.1.7. DISTRIBUTION OF PATIENTS TRAUMATISES ACCORDING TO THE GENERAL STATUS OF THE CHILD

2.1.7.1. Overall results

Out of 107 traumatized patients, the breakdown by medical condition is as follows: **(Tab 16)**

-98 patients had a good general condition, ie 91.6%.
-7 patients had a pathological condition, ie 6.5%.
-2 patients were disabled, ie 1.9%.

Medical Status	N	%
Healthy	**98**	**91,6**
Pathological state	**7**	**6,5**
Handicapped	**2**	**1,9**
Total	**107**	**100**

Table 16: Distribution of traumatized patients according to the general condition.

2.1.8. DISTRIBUTION OF TRAUMATISM ACCORDING TO THE PRESENCE OF FACIAL WOUNDS

2.1.8.1. Overall results

Out of 107 trauma cases, the distribution according to the presence of facial wounds is as follows: **(Tab17)**

-66 cases presented trauma without facial wounds, ie 61.7%.
-41 cases have trauma with facial wounds, ie 38.3%.

2.1.8.2. Distribution of wounds of the face according to their locations

In 41 trauma cases with facial wounds, the distribution according to the location of these wounds is as follows:

-The upper lip in 18 cases, 43, 9%.
-The chin in 6 cases, or 14.7%.
-The lower lip in 3 cases, ie 7.4%.
-The chin and the lower lip in 3 cases, ie 7.4%.
-Left cheek and chin in 2 cases, 4.9%.
-Chin and upper lip in 2 cases, 4.9%.
-The brow bone in 1 case, 2.4%.
-The lower lip; right cheek and chin at 1cas, 2.4%.
-The upper lip and the right cheek in 1 case, 2.4%.
-The right wing of the nose in 1 case, 2.4%.
-The upper lip; lower; the right cheek and ear in 1 case, 2.4%.

-Chin, upper and lower lip in 1 case, 2.4%.
-The nose in 1 case, 2.4%.

Presence of facial wounds	Nb	%
Non	**66**	**61,7**
Oui	**41**	**38,3**
Total	**107**	**100**

Table 17: Distribution of injuries according to the presence of facial wounds.

2.1.9. DISTRIBUTION OF TRAUMATISMS ACCORDING TO ORAL OPENING

2.1.9.1. Overall results

For the 107 trauma patients, we found 3 types of mouth opening: limited, deviated and normal opening. The distribution of the sample according to these 3 types is as follows: **(Tab 18)**

-91 patients have a normal aperture of 85%.
-14 patients have a limited opening, ie 13.1%.
-2 patients have a deviated aperture of 1.9%.

Oral opening	N	%
Normal	**91**	**85**
Limited	**14**	**13,1**
Deflected	**2**	**1,9**
Total	**107**	**100**

Table 18: Distribution of the sample according to the degree of oral opening

2.1.10. DISTRIBUTION OF TRAUMATISMS ACCORDING TO THE PRESENCE OF MUCOSAL LESIONS

2.1.10.1. Overall results

Out of 107 trauma cases, the distribution according to the presence of traumatic mucosal lesions is as follows: **(Tab19)**

-69 cases show trauma with mucosal lesions, ie 64.5%.
-38 cases do not have traumatic mucosal lesions, ie 35.5%.

2.1.10.2. Distribution of mucosal lesions according to their locations

Out of 69 trauma cases with mucosal lesions, the distribution according to the location of these lesions is as follows:

-The vestibular and anterosuperior palatal mucosa in 49 cases, ie 71%.
-The vestibular and anterior-lingual mucosa in 5 cases, ie 7.25%.
-The superior labial mucosa in 10 cases, ie 14.5%.

-The lower lip mucosa in 5 cases, ie 7.25%.

Mucosal lesions	N	%
Oui	69	64,5
Non	38	35,5
Total	107	100

Table 19: Distribution of injuries according to the presence of mucosal lesions

2.1.11. DISTRIBUTION OF TRAUMATISMS BY NUMBER OF TRAUMATED TOOTH

2.1.11.1. Overall results

Out of 107 trauma cases, the distribution according to the number of traumatized teeth is as follows: **(Tab 20)**

-Trauma to a single tooth in 34 cases, or 31.8%.
-2-tooth trauma in 45 cases, or 42.1%.
-Trauma of 3 teeth in 13 cases, ie 12.1%
-Trauma of 4 teeth in 10 cases, ie 9.3%.
-Trauma of more than 4 teeth in 5 cases, ie 4.7%.

Number of teeth	N	%
1 tooth	34	31,8
2 teeth	45	42,1
3 teeth	13	12,1
4 teeth	10	9,3
Beyond 4 teeth	5	4,7
Total	107	100

Table 20: Distribution of the sample according to the number of traumatized teeth.

2.1.11.2. Breakdown by age group

The distribution of overall results by number of traumatized teeth and age groups is as follows**:** **(Tab 21)**

-Trauma of a single tooth:
-From 6 to 9 years old:
+7 patients or 31.8%.
-From 9 to 12 years old:
+21 patients or 38.2%.
-12 to 15 years old:
+6 patients or 20%

-Trauma of two teeth:
-From 6 to 9 years old:
+15 patients or 68.2%.
-From 9 to 12 years old:
+20 patients or 36.3%.

-12 to 15 years old:
+10 patients or 33.4%.

-Trauma of three teeth:
-From 6 to 9 years old:
+No case recorded, 0%.
-From 9 to 12 years old:
+9 patients or 16.4%.
-12 to 15 years old:
+4 patients or 13.3%.

-Trauma of four teeth:
-From 6 to 9 years old:
+No case recorded, 0%.
-From 9 to 12 years old:
+4 patients or 7.3%.
-12 to 15 years old:
+6 patients or 20%.

-Trauma of more than four teeth:
-From 6 to 9 years old:
+No case recorded, 0%.
-From 9 to 12 years old:
+1 patient is 1.8%.
-12 to 15 years old:
+4 patients or 13.3%.

Age / Number	6-9 years		9-12 years		12-15 years		Total	
	N	%	N	%	N	%	N	%
1 tooth	7	31,8	21	38,2	6	20	34	31,8
2 teeth	15	68,2	20	36,3	10	33,4	45	42,1
3 teeth	0	0	9	16,4	4	13,3	13	12,1
4 teeth	0	0	4	7,3	6	20	10	9,3
Beyond 4 teeth	0	0	1	1,8	4	13,3	5	4 ,7
Total	22	20,6	55	51,4	30	28	107	100

Table 21: Distribution of number of traumatized teeth as a function of age

2.1.11.3. Distribution by sex

The distribution of overall results by number of traumatized teeth and sex is as follows: **(Tab 22)**

-Trauma of a single tooth:
+Male: 22 patients or 29.7%.
+Female sex: 12 patients or 36.3%.

Trauma of two teeth:
+Male: 31 patients or 41.9%.
+Female sex: 14 patients, ie 42.4%.

Trauma of three teeth:
+Male: 10 patients or 13.5%.
+Female sex: 3 patients, ie 9.1%.

Trauma of four teeth:
+Male: 8 patients or 10.8%.
+Female sex: 2 patients, ie 6.1%.

Trauma of more than four teeth:

+Male: 3 patients, ie 4.1%.

+Female sex: 2 patients, ie 6.1%.

Sexe / Number	Male		Female		Total	
	N	%	N	%	N	%
1 tooth	22	29,7	12	36,3	34	31,8
2 teeth	31	41,9	14	42,4	45	42,1
3 teeth	10	13,5	3	9,1	13	12,1
4 teeth	8	10,8	2	6,1	10	9,3
Beyond 4 teeth	3	4,1	2	6,1	5	4 ,7
Total	74	69,2	33	30,8	107	100

Table 22: Distribution of number of traumatized teeth by sex.

2.1.11.4. Distribution of the number of traumatized teeth according to the circumstances of occurrence

The distribution of the overall results according to the number of traumatized teeth and the circumstances of occurrence is as follows: **(Tab 23)**

After the falls:

Out of 107 cases, 36 traumatized patients were noted following falls, ie 33.6%

Trauma of a single tooth:

-We have 16 patients, 44.4%

Trauma of two teeth:

-We have 13 patients or 36.1%

Trauma of three teeth:

-We have 4 patients or 11.1%

Trauma of four teeth:

-We have 2 patients or 5.6%

Trauma of more than four teeth:

-We have 1 patient or 2.8%.

Following an accident on public roads:

Out of 107 traumatized patients, 20 patients were traumatized as a result of AVP, ie 18.7%.

Trauma of a single tooth:

We have 2 patients traumatized as a result of AVP, 10%

¬ Trauma of two teeth:

We have 8 traumatized patients, 40%

¬ Trauma of three teeth:

We have 4 traumatized patients, 20%.

¬ Trauma of four teeth:

We have 3 traumatized patients, 15%

¬ Trauma of more than four teeth:

We have 3 trauma patients, 15%

Following an accident at home:

Out of 107 cases, 15 traumatized patients were reported following an accident at home, ie 14%.

Trauma of a single tooth

-We have 5 patients, 33.3%

Trauma of two teeth

-We have 7 patients, 46.7%

Three-tooth trauma

-We have 2 patients, 13.3%.

Trauma of four teeth:

-We have 1 patient, 6.7%

Trauma of more than four teeth:

-We have no patient or 0%.

Following the brawls:

Out of 107 cases, 15 patients were traumatized following the brawls, ie 14%:

Trauma of a single tooth:

-We have 4 patients, 26.7%

Trauma of two teeth:

-We have 8 patients, 53.3%

Trauma of three teeth:

-We have 1 patient, 6.7%

Trauma of four teeth:

-We have 2 patients, 13.3%

Trauma of more than four teeth

-We have no patient or 0%.

Following an accident at school:

Out of 107 cases, 16 patients were found traumatized following accidents at school, ie 15%.

Trauma of a single tooth:

-We have 6 patients, 37.5%

Trauma of two teeth:

-We have 7 patients, 43.7%

Trauma of three teeth:

-We have 2 patients, 12.5%

Trauma of four teeth:

-We have no case, 0%

Trauma of more than four teeth:

-We have 1 patient, or 6.3%.

Following sports activities:

Out of 107 cases, 5 traumatized patients were reported following sports activities, ie 4.7%.

Trauma of a single tooth:

-We have 1 patient, 20%.

Trauma of two teeth:

-We have 2 patients, 40%

Trauma of three teeth:

-We have no patient, 0%

Trauma of four teeth:

-We have 2 patients, 40%

Trauma of more than four teeth

-We have no case, 0%.

circumstances of occurrence. / Number	Falls		AVP		Accidents at home		Rixes		Accidents at school		Sports activities		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1 tooth	16	44,4	2	10	5	33,3	4	26,7	6	37,5	1	20	34	31,8
2 teeth	13	36,1	8	40	7	46,7	8	53,3	7	43,7	2	40	45	42,1
3 teeth	4	11,1	4	20	2	13,3	1	6,7	2	12,5	0	0	13	12,1
4 teeth	2	5,6	3	15	1	6,7	2	13,3	0	0	2	40	10	9,3
Beyond 4 teeth	1	2 ,8	3	15	0	0	0	0	1	6,3	0	0	5	4,7
Total	36	33,6	20	18,7	15	14	15	14	16	15	5	4,7	107	100

Table 23: Distribution of the number of traumatized teeth according to the circumstances of occurrence.

2.1.12. DISTRIBUTION OF TRAUMATISMS BY TYPE OF TRAUMATED TOOTH

2.1.12.1. Overall results

Out of 107 trauma cases we found 247 traumatized teeth, the distribution according to their type is as follows: (**Tab 24)**

-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%.

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 24: Distribution of injuries according to the type of traumatized teeth.

2.1.13. DISTRIBUTION OF TRAUMATISM ACCORDING TO THE RADIOGRAPHIC EXAMINATION INDICATED:

2.1.13.1. Overall results:

Out of 107 trauma cases, the distribution according to the X-ray examination indicated is as follows **(Tab 25)**:

-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 occlusal bite was reported in 3 cases, a prevalence of 2.8%.

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

Table 25: Overall distribution of different types of trauma.

2.1.14. SAMPLE DISTRIBUTION BY TYPE OF LESIONS

2.114.1. Overall results

Out of 107 trauma cases, we found 305 traumatic injuries including: **(Tab 25)**

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

The distribution of the overall results according to the different types of trauma of the hard tissue of the tooth is as follows: **(Tab 26)**

- 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, ie 9.5%.

-Simple corono-radicular fractures in 1 case, ie 0.3%.

-Complicated corono-radicular fractures in 7 cases, ie 2.3%.

-Radicular fractures in 6 cases, 2%

-155 trauma related to periodontal tissues, ie 50.8%.

The distribution of the overall results according to the different types of periodontal tissue trauma is as follows: **(Tab 27)**

-Concussion in the number of 3 cases, 1%.

-Subluxation number 39, or 12.8%.

-Extrusion in the number of 20 cases, ie 6.5%.

-Lateral dislocation in the number of 44 cases, ie 14.4%.

-Intrusion in the number of 17 cases, ie 5.6%.

-Expulsion in 32 cases, ie 10.5%.

-7 alveolar traumas, or 2.3%.

-2 traumas concerning the bone tissue, ie 0.7%.

Types 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 26: Distribution of the sample according to the different types of trauma of the hard tissues of the tooth.

Types 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.27: Distribution of the sample according to the different types of periodontal tissue trauma.

2.1.14.2. Distribution of trauma types by age

The distribution of overall results by type of injury and age group is as follows: **(Tab 28)**

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%.

Age / Types of trauma	**6-9** years		**9-12** years		**12-15** years		**Total**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Hard tissue of the tooth	**17**	**5,5**	**70**	**23**	**54**	**17,7**	**141**	**46,2**
Periodontal tissues	**26**	**8,5**	**70**	**23**	**59**	**19,3**	**155**	**50,8**
Alveolar fractures	**2**	**0,65**	**3**	**1**	**2**	**0,65**	**7**	**2,3**
Bone fractures	**0**	**0**	**0**	**0**	**2**	**0,7**	**2**	**0,7**
Total	**45**	**14,7**	**143**	**46,9**	**117**	**38,4**	**305**	**100**

Table 28: Distribution of types of injuries by age group.

2.1.14.3. Distribution of types of trauma by sex:
The distribution of overall results by type of lesion and sex is as follows: **(Tab 29)**
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%.

Sex / Types of trauma	Male		Female		Total	
	N	%	N	%	N	%
Hard tissue of the tooth	98	32,1	43	14,1	141	46,2
Periodontal tissues	113	37	42	13,8	155	50,8
Alveolar fractures	4	1,3	3	1	7	2,3
Bone fractures	2	0,7	0	0	2	0,7
Total	217	71,1	88	28,9	305	100

Table 29: Distribution of types of trauma by sex.

2.1.14.4. Distribution of trauma types according to the circumstances of occurrence

The distribution of the overall results according to the type of trauma and the circumstances of occurrence is as follows: **(Tab 30)**

Trauma to the hard tissue of the tooth

-After the falls:

+Of 305 traumatic injuries, we found 47 lesions after falls, or 15.4%

-Following an accident on public roads:

+Of 305 traumatic injuries, we found 36 lesions following AVP, or 11.8%

-Following an accident at home:

+Of 305 traumatic injuries, we found 17 traumatic injuries following home accidents, ie 5.6%

-Following the brawls:

+Of 305 traumatic injuries, we found 15 traumatic injuries following brawls, or 4.9%

-Following an accident at school:

+Of 305 traumatic injuries, we found 14 traumatic injuries following school accidents, 4.6%.

-Following sports activities:

+Of 305 traumatic injuries, we found 12 traumatic injuries following sports activities, ie 3.9%.

Periodontal tissue trauma

-After the falls:

+Of 305 traumatic injuries, we found 39 lesions following falls, ie 12.8%

-Following an accident on public roads:

+Out of 305 traumatic injuries, we found 45 lesions following AVP, or 14.8%

-Following an accident at home:

+Of 305 traumatic injuries, we found 17 traumatic injuries following home accidents, ie 5.6%.

-Following the brawls:

+Of 305 traumatic injuries, we found 19 traumatic injuries following brawls, ie 6.2%.

-Following an accident at school:

+Of 305 traumatic injuries, we found 23 traumatic injuries following school accidents, or 7.5%.

-Following sports activities:

-Of 305 traumatic injuries, we found 12 traumatic injuries following sports activities, ie 3.9%.

Alveolar fractures

-After the falls:

+Out of 305 traumatic injuries, we found 3 alveolar fractures following falls, ie 1%.

-Following an accident on public roads:

+Out of 305 traumatic injuries, we found 4 alveolar fractures following AVP, ie 1.3%.

-Following an accident at home:

+No case registered, 0%

-Following the brawls:

+No case registered, 0%

-Following an accident at school:

+No case registered, 0%

-Following sports activities:

+No case registered, 0%

Bone fractures

-After the falls:

+Of 305 traumatic injuries, we found a bone fracture following falls, 0.35%

-Following an accident on public roads:

+No case registered, 0%.

-Following an accident at home:

+No case registered, 0%.

-Following the brawls:

+No case registered, 0%.

-Following an accident at school:

+Of 305 traumatic injuries, we found a bone fracture following accidents at school, 0.35%.

-Following sports activities:

+No case registered, 0%

Circonstances / Types of traumatisme	Falls		Road accidents		Home Accident		Rixes		Accident at School		Sports Activities		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Hard tissue of the tooth	47	15,4	36	11,8	17	5,6	15	4,9	14	4,6	12	3,9	141	46,2
Periodontal tissues	39	12,8	45	14,8	17	5,6	19	6,2	23	7,5	12	3,9	155	50,8
Alveolar fractures	3	1	4	1,3	0	0	0	0	0	0	0	0	7	2,3

Bone fractures	**1**	**0,35**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0,35**	**0**	**0**	**2**	**0,7**
Total	**90**	**29,5**	**85**	**27,8**	**34**	**11,1**	**34**	**11,1**	**37**	**12,1**	**24**	**7,7**	**305**	**100**

Table 30: Distribution of the types of traumas according to the circumstances of occurrence.

2.1.15. Distribution according to the associated traumatisms

2.1.15.1. Overall results

Out of 107 traumatized patients, 24 patients presented trauma associated with both dental and periodontal therapy, ie 22.4%.

2.1.15.2. Breakdown by age group

The distribution of the overall results according to the associated traumas and age groups is as follows: **(Tab 31)**

-From 6 to 9 years old:

+3 patients had associated trauma ie 13.6%.

-From 9 to 12 years old:

+14 patients had associated trauma ie 25.5%.

-12 to 15 years old:

+7 patients had associated trauma ie 23.4%.

Age	**6-9** years		**9- 12** years		**12-15** years		**Total**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Associated trauma	3	13,6	14	25,5	7	23,3	24	22,4

Table 31: Distribution of Associated Injuries by Age Group

2.1.15.3. Distribution by sex

The distribution of the overall results according to the associated traumatisms and the sex is the following one: **(Tab 32)**

-Male sex: 15 patients or 20.3%.

-Female sex: 9 patients or 27.3%.

Sex	**Male**		**Female**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**
Associated trauma	15	20,3	9	79,7	24	22,4

Table 32: Distribution of Associated Injuries by Sex.

2.1.15.4. Distribution of associated injuries according to the circumstances of occurrence

The distribution of the overall results according to the associated traumas and the circumstances of occurrence is as follows: **(Tab 33)**

After the falls:

-8 patients had trauma associated with falls, 22.2%.

Following an accident on public roads:

-7 patients had trauma associated with AVP 35%.

Following an accident at home:

-4 patients had trauma associated with a home accident, 26.7%.

Following the brawls:

-No cases were recorded, 0%.

Following an accident at school:

-4 patients had trauma associated with an accident at school, 25%.

Following sports activities:

-1 patient presented a trauma associated with sports activities, ie 20%.

Circumstances Of Occurrence	Falls		Road accidents		Accidents to home		Rixes		Accidents at school		Sports activities		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Associated trauma	8	22,2	7	35	4	26,7	0	0	4	25	1	20	24	22,4

Table 33: Distribution of associated injuries according to the circumstances of occurrence.

2.1.16. DISTRIBUTION OF TRAUMATISMS ACCORDING TO MANAGEMENT

2.1.16.1. Overall results

In 107 trauma cases, we noted 237 treatments performed, the distribution according to the support is as follows: **(Tab 34)**

-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, ie 0.9%. Cervical pulpotomy in no case.

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 34: Distribution of the sample according to the treatment carried out

3. DISCUSSION

Before beginning the discussion of our results, we need to shed light on several points that will help to make a sound assessment of the quality of our study. They will avoid any confusion to readers, and answer questions that any specialist in the field may ask.

3.1. DISCUSSION OF EQUIPMENT AND METHODS

3.1.1. FACTORS RELATED TO THE CHOICE OF THE SURVEY TYPE

It is true that the type of survey we have undertaken (descriptive descriptive cross-sectional epidemiological survey) is far from the ideal type of survey for this type of study. The survey should have been retrospective, as is the case for most similar studies, to determine the prevalence of trauma over months over a longer period of time. However, the unavailability of complete files at the level of archives has been a constraint to allow such a possibility.

3.1.2. RELIABILITY OF EVALUATION METHODS

3.1.2.1. Reliability linked to the information collected

The quality of the information obtained is questionable for certain variables, which must be taken into consideration when discussing our results.

-Socio-economic level (NSE):

The evaluation of the socio-economic level adopted in our survey is based on the interrogation of the subject by asking the profession of the tutor. The socio-economic level of the guardian has been classified according to 3 categories: low, medium, high, as previously described. This could be a source of bias in our survey because in reality the NSE based on socio-occupational categories does not accurately reflect the economic level of a family. Indeed the income of a family can not be limited to the only income of the guardian because there can be other sources which are not taken into account in our studies, in addition, a person judged belonging to a social group - average economic by profession can be classified in a low socio-economic group when considering the number of people in charge, something that was not taken into consideration in our study.

-Reliability of other variables:

The reliability of the other variables collected in our survey depends on:

+The subjectivity of the given answers: this parameter concerns the date; the place ; the circumstances of occurrence of trauma and the presence of signs of head trauma.

3.1.4. VALIDITY OF THE RESULTS OBTAINED

The evaluation of our study is done on two levels:

-The intrinsic value:

The strategy of approach of the subjects of study as well as the clinical means and statistics elaborated to treat the results eliminate any risk of miscalculation or methodology, also the difficulties and the biases found during this study were quite tolerable. and could not distort our results. So we feel that our study is of good intrinsic value.

-The extrinsic value:

The usefulness of the results we obtained is that they constitute statistical evidence in the question of the prevalence of trauma among children aged 6 to 15 years.

Any comparison with a similar study must take into consideration the materials and methods used in these studies.

3.2. DISCUSSION OF THE RESULTS

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.

3.2.1. CHARACTERISTICS OF THE TRAUMATITIS PATIENT

3.2.1.1. Sex

Our study shows that trauma affects the male and female sex quite unequally.

Boys are indeed twice as affected as girls.

M / F 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 therefore 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 35**).

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)** involving 157 traumatized 12-year-olds in Lagos State, Nigeria **(23, 24, 25, 26).**

Authors	Year	Sample	Male	Female
BENHAMADI A. (27, 28, 29, 30) (Casablanca, Maroc)	**1997**	**150**	**62,7%**	**37,3%**
CALDAS Jr A.F. et coll. (7) (Recife, Brésil)	**2001**	**127**	**67,7%**	**32,3%**
NICOLAU B. et coll. (6) (Cianorte, Brésil)	**2001**	**133**	**66,9%**	**33,1%**
NIK-HUSSEIN N.N. et coll. (9, 11) (Kuala lumpur , Malaisie)	**2001**	**169**	**64,5%**	**35,5%**
ROCHA M.J.C. et coll. (25) (Santa catarina, Brésil)	**2001**	**36**	**61,1%**	**38,9%**
RAJAB L.D. et coll. (1) (Amman, Jordanie)	**2003**	**391**	**64,2%**	**35,8%**
TAPIAS M.A. et coll. (5) (Mostoles, Spain)	**2003**	**82**	**67,1%**	**32,9%**
BAUSSO et coll. (17) (Genève, Suisse)	**2004**	**141**	**63,1%**	**36,9%**

ZUHAL K. et coll. (13) (Isoparta, Turquie)	**2005**	**317**	**64%**	**36%**
PRESENT STUDY (Casablanca, Maroc 2018)	**2018**	**107**	**69,2%**	**30,8%**

Table 35: Bibliographic summary of trauma by sex.

3.2.1.2. 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 36**).

3.2.1.3. Socio-economic level

Our study has shown that children who have suffered trauma are more often from low socio-economic backgrounds. This can be explained by violence in poor neighborhoods, as well as outside activities that may be causing a higher incidence of trauma.

This predominance of trauma in children from poor or modest backgrounds is found by:
MULLER M. et al. **(8)** on a study carried out in Nice in France on 554 traumatized children under 15 years old.

However, these results do not corroborate with other studies, in fact, the studies conducted by TAPIAS M.A. and COLL **(5)** in Mostoles, Spain, on 82 cases, as well as that conducted by CORTES M.I.S. et al. **(26**) in Belo Horizonte, Brazil, and KAHABUKA F.K. et al. **(24***)* in Dar es Salam, Tanzania, showed that children from high socio-economic background are more likely to be traumatized.
Another study conducted in Texas in the United States by ALONGE O.K. et al **(15)** showed that the number of traumatized children is almost the same whatever the socio-economic level.

Authors	Sample	Echantillon	Prevalence	Age Pic
UJI et coll. (7) (Japon)	1988	15822	21,8%	6-12
CRONA-LARSSON et coll. (7) (Suède)	1989	108		10
DELATTRE et coll. (7) (France)	1995	2020	13,6%	12
PETTI et COLL (7) (Italie)	1996	824	20,26%	9
BENHAMADI A. (27, 28, 30) (Casablanca, Maroc)	1997	150		9-12
MARCENES et coll. (7) (Syrie)	1999	1087	33,2%	11
SANDALLI N. et coll. (16) (Turquie ; Istanbul)	2005	91		6-11
ZUHAL K. et coll. (13) (Turquie, Isparta)	2005	514		9-11
PRESENT STUDY (Casablanca, Maroc 2018)	**2006**	**107**	**12,6%**	**10**

Table 36: Bibliographic summary of trauma by age

3.2.1.4. Place of residence

In our study the urban environment is the most represented. According to our results 86% of trauma patients are from this environment. This is explained by:

-Predominance of the urban population.
-The presence of dental units in urban areas.
-The use of traditional medicine in rural areas
-High exposure to risks in the urban environment (AVP, aggression, sports activities...)

Our results are confirmed by studies by SKAARE A.B. et al. **(31**) in Oslo, Norway, and NIK-HUSSEIN N.N. **(25)** in Kuala lumpur, Malaysia, and GRIMM S. et al. **(32)** in Sao Paulo, Brazil.

3.2.1.5. 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, 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%, value 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. But 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. And with ZUHAL K. et al. **(13)** in Isparta, Turkey, who found that 38.8% of traumatized patients consult beyond 6 months.

3.2.1.6. 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 that can spend 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 during times when children are more agitated.

These results are consistent with ATLAY 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.

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

3.2.1.7. The circumstances of the occurrence of the trauma

According to our study, the circumstances of occurrence 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 etiology of dental trauma. This is explained by their serious general 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 37**)

Authors	Falls	AVP	Rixes	Sports	Other

BENHAMADI (39) (Casablanca, Maroc 1997)	66%	15,34%	6,66%	4%	8%
GABRIS K. et coll. (33, 35,36) (Budapest, Hongrie2001)	12%	7%	3%	29%	49%
	24,1%	10,5%	16,5%	2,3%	46,6%
NICOLAU B. et coll. (39) (Cianorte, Brésil 2001)	65,35%	4,72%	2,36%	3,93%	14,15%
SARUGLU L. et coll. (39) (Ankara, Turquie 2002)	27,7%	11,3%	24%	18,8%	18,2%
CANAKCI V. et coll. (38) (Erzurum, Turquie 2003)	43,9%	6,1%	9,8%	12,2%	28%
TAPIAS M.A. et coll. (5) (Mostoles, Espagne 2003)	47,9%	2,1%	37,5%	-----	12,5%
TRAEBERT J. et coll.(37) (Florianópolis, Brésil 2003)	49,6%	17%	14,2%	14,2%	5%
BAUSS O. et coll. (17) (Genève, Suisse 2004)	84%	6%	--	--	10%
SANDALLI N. et coll. (16) (Istanbul, Turquie 2005)	47,6%	3,4%	23,7%	3,8%	21,5%
ZUHAL K. et coll. (13) (Isparta, Turquie 2005)	**33,6%**	**18,7%**	**14%**	**4,7%**	**29%**
PRESENT STUDY (Casablanca, Maroc 2018)					

Table 37: Bibliographic summary of traumas according to the circumstances of occurrence.

3.2.2. CLINICAL DATA

3.2.2.1. Number of traumatized teeth

According to our study, trauma involving two teeth is more common (42.1%), tooth trauma (31%), or more than two teeth, this could be related to a certain number of teeth. number of factors:

-The point of impact of the trauma usually involves two teeth instead of one or more teeth.

-The strength of the object is also a factor on which the number of traumatized teeth depends. A small object causes more isolated trauma, while a wide and rounded object increases the impact surface on the dental crowns thus gives multiple traumas.

-Superior proalveolia and labial incompetence are also contributing factors to trauma, which in most cases affects both upper central incisors.

These results are confirmed by SORIANO EP. et al. (**2, 3, 4**), in the study conducted in Camaragibe, Brazil, by AL-MAJED I. et al. in Riyadh, Saudi Arabia **(2**), by Grimm S. et al. **(32),** in Sao Paulo, Brazil, and by ARTUN J et al. **(5**) in Kuwait the capital.

But different authors have found that trauma to a single tooth is the most common. **(7, 17, 25, 38, 31, 40, 41)** (**Tab 38**)

Authors	**1 tooth**	**2 teeth**	**3 teeth**	**4 teeth**	**Beyond 4 teeth**

BENHAMADI A (27, 28, 30) (Casablanca, Maroc 1997)	14%	48%	14,67%	19,33%	4,1%
	62%	30,2%	4,7%	2,2%	0,9%
CALDAS Jr AF et coll. (7) (Récif, Brésil 2001)	73,5%	15%	7,5%	4%	
NIK-HUSSEIN et coll. (25) (Kuala Lumpur, Malaisie 2001)	67,3%	15,2%	8,4%	9,1%	
CANAKCI V. et coll. (38) (Erzurum, Turquie 2003)	58%	32%	6%	3%	1%
SKAARE A.B. et coll.(42) (Oslo, Norvège 2003)	73,2%	24,4%	1,2%	1,2%	
TAPIAS M.A. et coll. (5) (Mostoles, Espagne 2003)	53,9%	35,5%	9,2%	1,4%	
BAUSS O. et coll. (6) (Genève, Suisse 2004)	88,6%	11,4%	--	---	
TOVO M.F et coll. (18) (Canoas, Brésil 2004)	53,3%	36,9%	5%	4,4%	0,4%
ZUHAL K. et coll. (13) (Isparta, Turquie 2005)					
PRESENT STUDY **(Casablanca, Maroc 2018)**	**31,8%**	**42,1%**	**12,1%**	**9,3%**	**4,7%**

Table 38: Bibliographic summary of trauma by the number of teeth involved in the trauma

Authors	ICS	ILS	ICI	ILI	Others
BENHAMADI A (27, 28, 30) (Casablanca, Maroc 1997)	67%	21,3%	5,2%	4,9%	1,6%
CORTES MIS. et coll. (26) (Belo Horizonte, Brésil 2001)	87,2%	3,1%	5,6%	1,1%	3%
NIK-HUSSEIN NN. (25) (kuala Lumpur, Malaisie 2001)	78%	9,5%	7%	5,5%	
SAROGLU I .et coll. (39) (Ankara, Turquie 2002)	86%	8,5%	3%	2%	0,5%
CANAKCI V. et coll. (38) (Erzurum, Turquie 2003)	67,5%	13,7%	10,9%	7,9%	
SKAARE AB. et coll. (42) (Oslo, Norvège 2003)	65%	12%	12%	6%	5%
BAUSS O. et coll. (17) (Genève, Suisse 2004)	79,6%	16,4%	3%	1%	
TOVO MF. et coll. (18) (Canoas, Brésil 2004)	84,5%		10,3%	5,2%	
AGBELUSI G.A. (19, 21; 22) (Lagos, Nigeria 2005)	67,4%	25,4%	3,3%	3,9%	
PRESENT STUDY (Casablanca, Maroc 2018)	**68%**	**17%**	**4%**	**2,4%**	**8,5%**

Table 39: Bibliographic summary of trauma by type of teeth involved

3.2.3.3. Alveolar trauma

Authors	Fêl	FA	FA DS	FAD C	FC RS	FC RC	FR	Cc	Sub	Extr	LL	Intr	Exp
BENHAMADI A (7)	6,32 %	6,1 %	18,9 %	9,8 %	0,6 %	1,4 %	1,9 %	16,4 %	22,9 %	3,95 %	0,6 %	2,57 %	4,7%
ALTAY N et coll. (4)	5,1 %		29,2 %	10,2 %	2,1 %	4,1 %	6,2 %		13,3 %	6,7 %	6,7 %	6,2 %	9,2%
GABRIS K et coll. (13)		24,5 %	48,7 %	4,9 %			0,8 %				16,6 %		4,39 %
SAROGLU I et coll. (27)			37,8 %				2,8 %	1%	4%	3%	2%	1,5 %	9%
CANAKCI V et coll. (9)		7%	50,5 %	16%	0,5 %	0,5 %	2%	3,3 %	5,3 %	3%	4,8 %	1,5 %	3,6%
GASSNER R et coll. (15)	6,1 %		59,7 %	4,1 %	1,5 %		5,3 %	1,9 %	47,9 %			2,5 %	7,1%
KARGUL P et coll. (19)		36%	28,1 %	11,8 %			1,3 %		0,62 %	2,04 %	3,3 %	2,7 %	7,1%
SKAARE A.B et **coll.**(28)	6%	17,4 %	18,2 %	2,6 %	0,7 %	0,9 %	1,2 %	31,8 %	16,9 %	1,3 %	2,1 %	0,3 %	0,6%
SANDALLI N et**coll.**(26)	37,3 %		20,2 %	12%							1,2 %	2,2 %	12%
PRESENT STUDY (Casablanca	**0,65 %**	**2,9 %**	**28,5 %**	**9,5 %**	**0,3 %**	**2,3 %**	**1,96 %**	**1%**	**12,8 %**	**6,55 %**	**14,4 %**	**5,6 %**	**10,5 %**

Table 40: Bibliographic synthesis of studies according to trauma of hard and periodontal tissues.

According to our study, there are 7 fractures in the alveolar trauma, ie 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.

3.2.3.4. Bone trauma

According to our study, bone trauma is the least represented category. In fact 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),** Piracicaba.Brazil, raised the percentage by 13.46%.

3.2.4. 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.

3.2.5. 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 behavior 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.
- MARCENES W. et al. **(49),** London, United Kingdom

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.

-The high frequency of injuries in the urban environment, and especially among children of low socioeconomic status.

-Among the etiologies, a majority of falls, and accidents of public roads.

-The high frequency of accidents on the street 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.

-Interesting two-tooth trauma is more common than trauma involving one or more teeth with a percentage in the range of 42.1%.

-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 to 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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