ORIGINAL ARTICLE

A retrospective study of traumatic injuries to teeth at a Nigerian tertiary hospital

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Abstract

Background: Various aspects of dental trauma have been studied worldwide. Most of these were among children and adolescents. However, studies involving the adult population with traumatized anterior teeth are few.

Objectives: The objectives of this study were to report the pattern of trauma to anterior and posterior teeth among the late adolescent and adult patients seen at the Dental Centre, University College Hospital, Ibadan, Nigeria, the time lapse between trauma and patient presentation, reasons for dental consultation, and the type of treatment received.

Materials and Methods: Data were extracted from the dental records of 146 patients with dental trauma that presented between May 2001 and June 2006.

Results: One hundred and forty six patients were studied (87 males, 59 females) Males sustained injury more than females. The highest occurrence of trauma was in the age group of 25-34 years and least in the >65 years. Falls accounted for 34.3% of causes followed by RTA (19.2%). Enamel-dentine fracture was the most common type of injury, seen in 73 (38.6%) of the traumatized teeth, 5 were avulsed and 20 posterior teeth had cuspal fracture. All the cases of avulsion and most (83.3%) of root fracture presented within 1 week of injury while teeth that presented late had pulpal necrosis. 22% of the patients presented within 1 week of injury while 13.7% came after 10 years.

Conclusion: There was late patients' presentation with average duration of trauma before presentation being 4.6 years; however the more severe the outcome of trauma, the earlier the presentation. Poor esthetics followed by pain were the main complaints at presentation.

Key words: Retrospective study, teeth, traumatic injuries

Date of Acceptance: 08-Oct-2011

Introduction

Patients with traumatic injuries to teeth and their supporting tissues are frequently encountered in dental practice. They present with various types of dental hard tissue injuries ranging from simple enamel infraction to complicated fracture of crown and/or root or even the avulsion of the tooth or teeth. Several studies[1-9] have been conducted worldwide to investigate various aspects of these injuries, especially in children and adolescents. Such studies have focused on the pattern, time lapse between trauma and dental consultation, complications and treatment of traumatized anterior teeth.[3-5] Most of these studies have reported traumatized teeth to be more prevalent among males,[7,8] fall to be the commonest cause,[1-4] single tooth involvement as the most predominant,[1,2,9] and maxillary incisors as being the most commonly affected.[3,5] Late hospital presentation was reported as the usual practice,[3,5,6] while complications include pulpal necrosis and dentoalveolar abscess.[7] Documented treatment given ranged from no active treatment to elaborate dental procedures such as root canal therapy or extraction of the affected teeth.[6,7]

Studies involving the adult population with traumatized

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Access this article online

Quick Response Code:

Website: www.njcponline.com

DOI: 10.4103/1119-3077.100631

PMID: 22960969

anterior teeth were few.[10-13] However, the injuries appeared to follow the same pattern especially with regard to gender distribution, the tooth type mostly affected and the type of injury to the teeth and the surrounding tissues. On the other hand, road traffic accident (RTA) was documented to be the commonest cause among the adults in some studies.[12,13] Accidental damage to orodental tissues during endotracheal intubation and general anesthesia has also been reported among adults.[14]

Other areas such as the reason for presentation, the time lag between occurrence of trauma, and presentation at the dental clinic have not been extensively studied among the adults. The objectives of this retrospective study were to report the pattern of trauma both in the anterior and posterior teeth among the late adolescents and adult patients, the time lapse between trauma and patients' presentation, reasons for dental consultation as well as the type of treatment received.

Materials and Methods

The subjects for the study consisted of dental trauma patients managed at the conservative unit of Dental Centre, University College Hospital, Ibadan, between May 2001 and June 2006. Information gathered from the patients hospital records included age, gender, reasons for presenting, tooth type fractured, causes, class and duration of trauma as well as the treatment received. WHO classification[15] of trauma to anterior teeth slightly modified with Ellis and Davey's[16] classification was used. Cuspal fracture of the posterior teeth was also noted.

Data was analysed using SPSS version, a Chi-square test was used to test associations between categorical variables. Differences were regarded as statistically significant at the $P \leq 0.05$.

Results

One hundred and forty six patients aged 16–78 years were managed during the study period. Eighty seven (59.6%) were males while fifty nine (40.4%) were females giving a male to female ratio of 1.5:1. The mean age of the patients was 33.2 ± 13.5 years [Table 1]. Males sustained injuries more frequently than females in all age groups although this difference was not statistically significant. The highest occurrence of trauma was in the age group of 25-34 years and the least in the age group of >65 years with 59 (40.4%) and 7 (4.8%) respectively.

Falls accounted for 34.3% of the causes, followed by road traffic accidents (19.2%). Of the 28 cases that resulted from RTA, 15 occurred in the 25–34 age group. Other causes included assaults by armed robbers and during mob attack, accidents at work, while 14 (9.6%) of the patients could not remember the cause of trauma [Table 2].

The time lag between the occurrence of trauma and patients' presentation in the clinic is shown in Table 3. In all, the patients presented with 189 traumatized teeth (169 anterior and 20 posterior). The most common type of injury was the uncomplicated crown fracture (enamel-dentine fracture) seen in 73 (38.6%) of the traumatized teeth, followed by the complicated crown fracture which accounted for 16.9% of the causes. Only 5 (2.6%) were totally avulsed and 20 posterior teeth had cuspal fracture. Twelve out of the 32 (37.5%) of the teeth with complicated crown fracture were seen within 1 week of trauma whereas 17 (81%) and 62 (84.9%) of the teeth with enamel and enamel-dentine

Table 1: Age and gender distribution of the patients at presentation

Gender	Age groups in years						Total *n* (%)
	15–24	25–34	35–44	45–54	55–64	>65	
Male	23	37	10	9	4	4	87 (59.6)
Female	19	22	5	6	4	3	59 (40.4)
Total *n* (%)	42 (28.7)	59 (40.4)	15 (10.3)	15 (10.3)	8 (5.5)	7 (4.8)	146 (100)

Mean age = 33.2 years ± 13.5 years $\chi^2 = 5.29$, $P = 0.508$

Table 2: Causes of Trauma according to age groups

Age group	Causes								Total
	Fall	RTA	Fight	Domestic	Sport	During mastication	Others	Unknown	
15–24	22	6	3	2	1	2	2	4	42
25–34	23	15	3	2	3	5	6	2	59
35–44	4	1	-	1	1	2	3	3	15
45–54	1	2	-	-	-	7	1	4	15
55–64	-	4	1	-	-	2	-	1	8
≥65	-	-	-	-	-	7	-	-	7
Total *n* (%)	50 (34.3)	28 (19.2)	7 (4.8)	5 (3.4)	5 (3.4)	25 (17.1)	12 (8.2)	14 (9.6)	146 (100)

Other causes included assault by armed robbers, mob attack, professional hazard, hit by an object

Table 3: Time lapse between trauma and presentation for the different types of traumatized teeth

Duration	Enamel fracture	Enamel-dentine fracture	Complicated crown fracture	Non-vital or necrosed tooth	Avulsion	Root fracture	Crown root fracture	Cuspal fracture	Total
<1 week	4	11	12	-	5	5	4	6	47
1 week ≤1 month	6	10	3	-	-	-	2	3	24
1 month ≤1 years	3	11	4	-	-	1	1	4	24
1 years ≤5 years	4	12	5	2	-	-	1	2	26
5≤10 years	2	13	4	7	-	-	-	2	28
>10 years	2	8	3	11	-	-	-	-	24
Not stated	-	8	1	4	-	-	-	3	16
Total (%)	21 (11.1)	73 (38.6)	32 (16.9)	24 (12.7)	5 (2.6)	6 (3.2)	8 (4.2)	20 (10.7)	189 (100)

Table 4: Treatment given versus time lag

Treatment given	Duration of trauma							Total
	<1 week	1 week–1 month	1 month–1 year	1–5 years	5–10 years	>10 years	Cannot remember	
Simple restorations	5	7	9	3	7	3	3	37
RCT	7	4	6	5	10	6	3	41
RCT+Bleaching	-	-	-	1	2	8	1	12
Splinting	2	-	-	-	-	-	-	2
Extraction	5	-	-	2	2	-	1	10
RCT+ Splinting	4	-	-	-	-	-	-	4
Extraction+Denture	-	1	-	-	-	-	-	1
RCT+PFM crown	-	1	-	1	-	-	-	2
Did not return for treatment	9	5	3	8	4	3	5	37
Total	32 (21.9)	18 (12.3)	18 (12.3)	20 (13.7)	25 (17.1)	20 (13.7)	13 (8.9)	146 (100)

fractures respectively (uncomplicated crown fracture) presented after 1 week. All the cases of avulsion and most (83.3%) of the root fracture presented within 1 week of injury. Of the 47 teeth that presented within 1 week of 26 (55.3%) had severe injury, that is, complicated crown fracture, avulsion, root fracture and crown-root fracture [Table 3].

Table 4 shows that 109 (74.7%) patients received the planned treatment; the remaining 37 did not return for treatment. Thirty-seven patients had simple restoration (mainly composite fillings). Forty-five patients presented 5 years after trauma and 26 (57.8%) of them had root canal therapy.

Figure 1 shows that the patients presented in the clinic for various reasons. Seventy (48.0%) wanted to fill or restore their unesthetically acceptable traumatized teeth, while 52 (35.6%) presented because of pain.

The duration or the time lapse between trauma and patients presentation is shown in Figure 2. About 9% did not remember the time of occurrence of trauma, 22% presented within 1 week of injury, while approximately 14% came after 10 years of sustaining injury. The average duration of the time between trauma and presentation for dental consultation was 4.6 years.

Figures 3a and 3b show the pre and post composite restoration photograph of an uncomplicated crown fracture of an upper central incisor while Figures 4a and 4b are those of cuspal restoration of an upper first premolar.

Discussion

More males than females sustained injury to their anterior teeth as reported by previous studies.[7,15,16] This has been attributed to greater activities in males than females. The male-to-female ratio of 1.5: 1 reported in this study is in agreement with Balstone *et al*.[17] and Falomo[18] while it is close to that of Sandalli[7] and Otuyemi[19] who reported a ratio of 1.6:1. In contrast, Zerman and Cavalleri[20] reported a higher ratio of 2.7:1. These earlier studies were carried out in children and adolescents. Majority of the patients seen fell within the age group 25–34 years which coincides with the time most people start earning an income or are getting ready for marriage and are, therefore, more concerned about their appearance. Also, this is the age group where many are very active professionally.

Falls and RTAs are well-documented causes of trauma to anterior teeth.[12,13,21,22] Our finding is not different from this previous observation though we conducted the study among older age groups. A high percentage (19.3%) was

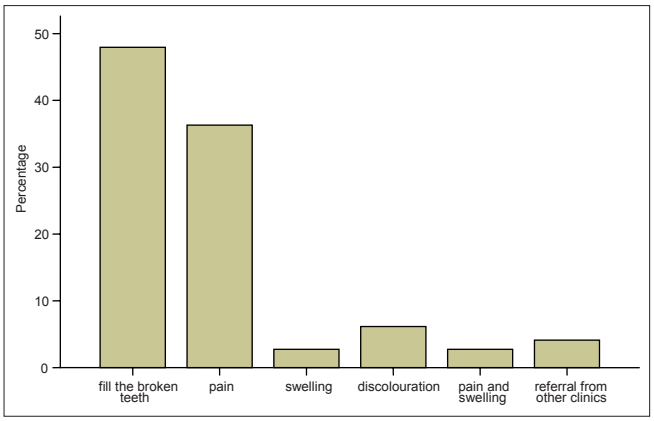

Figure 1: Patients' presenting complaints

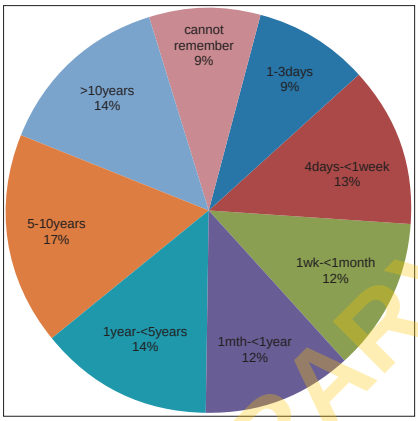

Figure 2: Time lag between trauma and patients presentation

Figure 3: (a) Enamel-dentine fracture of a central incisor. (b) Enamel-dentine fracture of a central incisor following restoration

Figure 4: (a) Cuspal fracture of first premolar: pretreatment photograph. (b) Cuspal fracture of first premolar: postrestoration photograph

attributed to RTA in this study; this is much higher than 1.5% recorded by Al-Jundi[20] who studied patients with age range 15 months to 14 years. This could be explained by the fact that many in Nigeria at this age (adult population) are involved in pursuit of career, academics, economic activities, or social events. In addition, it has been observed that the rate of RTA in Nigeria is still relatively high due to bad roads, among other reasons. In a study conducted by Caldas and Burgos[10] in the age range 1–59 years, they found out that the main causes of tooth injury were falls (72.4%), collisions

with objects 9.2%), violence (8.0%), road traffic accidents (6.8%), and sports (3.6%), while Otuyemi and Buluro[12] in their own study found out that falls was the main cause of injury in the 0–5 years and RTA (18.4%) was more common in the adult group. Masticatory force was a cause of trauma in this study, probably because trauma to posterior teeth was also considered. Trauma during mastication occurred more in older age groups (>45 years) whose teeth may have undergone some ageing process and thus more susceptible to fracture even under normal physiological force.

In this study, the average duration of trauma before dental consultation was 4.6 years. This is much higher than the average time of 5 months observed in a previous study.[20] Thirty-two (21.9%) patients presented in less than 1 week of sustaining trauma out of which 13 (8.9%) came within the first 3 days of sustaining trauma. This is much lower than 77% and 22.8% respectively reported in previous studies carried out abroad.[23,24] In a study reported about a decade ago among children seen in the same hospital, Osuji found that only 11% of the injuries presented for treatment on the day of trauma. These lower figures among children and adults in our environment may be attributed to low level of dental awareness, attitudes, and dental anxiety. Thus many of them consult dentists only if there is severe pain that could not be relieved after a long time of self-medication which has been reported to be prevalent worldwide.[25-27] Furthermore, our findings suggest that the severity of trauma determines the duration or time lapse before dental consultation since majority of the teeth seen within the first week of injury had severe dental trauma, that is, complicated crown fracture, root fracture, avulsion, and crown root fracture. Also, the longer the duration, the greater the number of teeth with pulpal necrosis [Table 3]. This finding is in agreement with that of Caliskan and Turkun[28] who reported that cases seen after a long post-traumatic period showed more complications than those presented within a short period.

The most frequent reason for dental consultation among the patients was poor esthetics due to unacceptability of the broken teeth as well as discoloration, followed closely by pain. This was in contrast to a previous finding[20] among children where pain was the commonest presenting complaint.

The treatment received by the patients in this study ranged from a simple coronal restoration to extraction of the affected teeth. It was observed in the study that more than half of the patients (57.8%) that came after 5 years needed to have a root canal therapy with or without bleaching done whereas only 25% of the patients that came in less than 1 year had the same treatment modality. Furthermore, a greater percentage (30.9%) of those that came in less than 1 year had simple restorations compared with the proportion (22.2%) seen among those that came after 5 years. This may not be unconnected with the late presentation pattern by the patients, as cases seen after a long post-traumatic period had been reported to require more complicated or extensive treatment than those that presented within a short time.[29] Immediate attendance with prompt and adequate treatment following trauma may, therefore, be a major contributory factor to the long-term prognosis of traumatic teeth.

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How to cite this article: Ajayi DM, Abiodun Solanke IM, Sulaiman AO, Ekhalufoh EF. A retrospective study of traumatic injuries to teeth at a Nigerian tertiary hospital. Niger J Clin Pract 2012;15:320-5.
Source of Support: Nil, **Conflict of Interest:** None declared.