



Prevalence of Anterior Tooth Fracture Due to Trauma in Southwest Coastal Population of India – an Epidemiological Study

KEYWORDS

Trauma, fracture, anterior tooth.

Dr Jyothi Shetty

Postgraduate student, Department of Conservative Dentistry and Endodontics, A B Shetty Memorial Institute of Dental Sciences, Mangalore -575 018

Prof (Dr) Mithra N Hegde

Vice Principal, Head of the Department, Department of Conservative Dentistry and Endodontics, A B Shetty Memorial Institute of Dental Sciences, Mangalore -575 018

Prof Dr Darshana Devadiga

Professor, Department of Conservative Dentistry and Endodontics, A B Shetty Memorial Institute of Dental sciences, Mangalore -575 018

Dr Mahalaxmi Yelapure

MDS, Lecturer, Department of Conservative Dentistry and Endodontics, A B Shetty Memorial Institute of Dental Sciences, Mangalore -575 018

ABSTRACT Traumatic dental injury is a significant problem seen in young adults and the incidence of trauma might exceed that of dental caries and periodontal disease in the future. The aim of the present study was to evaluate the prevalence of anterior tooth fracture due to trauma in the SouthWest Coastal population of India. The study was conducted on 2000 patients attending the Department of Conservative Dentistry and Endodontics, A B Shetty Memorial Institute of Dental Sciences, Mangalore and rural satellite centers of NITTE university. The prevalence of anterior teeth fracture were studied in relation to age, gender, location, occupation, cause, type of fracture and its association with molar relation. Standard questionnaire from Oral Health Survey WHO format 2013 was used for the survey. The prevalence of anterior tooth fracture due to trauma was most commonly seen in males, common etiological factor being fall and class II Division I malocclusion cases were more common.

INTRODUCTION:

Traumatic dental injury (TDI) is a significant problem seen in young adults and the incidence of trauma might exceed that of dental caries and periodontal disease in the future¹. The most common TDI are the uncomplicated and complicated crown fracture of permanent teeth². Most common dental injuries are those involving one tooth and majority of the affected teeth are the maxillary central incisors². These may be attributed to their anterior position and even the proclination caused by the eruptive patterns³. One of the main cause of traumatic dental injuries are increased overjet with protrusion and inadequate lip coverage⁴. These dental injuries can cause irreparable damage in children as many of the permanent teeth will be in the formative stage during this period⁵.

Traumatic dental injuries not only compromise dental health, but can also lead to aesthetic, psychological, social and therapeutic problems⁶. Traumatic dental injury (TDI) can occur during any age group, but prevail more frequently in teenagers. It may be due to various causes like falls, accidents or outcome of violence⁷.

Dental professionals are quite aware about the risks of traumatic dental injuries but they are not able to disseminate the same to general public and prevent its occurrence, also several epidemiologic studies have referred it as a serious dental health problem⁷. It has been reported that the majority of the dental injuries involve the anterior teeth⁸.

Hence the aim of the present study was to evaluate the prevalence of anterior tooth fracture due to trauma.

MATERIALS AND METHODOLOGY :

After obtaining institutional ethics clearance, the study was

conducted during the period of June-November 2015, on randomly selected 2000 patients from the out patient Department of Conservative Dentistry and Endodontics and rural satellite centres of NITTE university.

Sample Selection Criteria

Urban group were the patients reporting to the Department of Conservative Dentistry and Endodontics, A B Shetty Memorial Institute Of Dental Sciences, Deralakatte, Mangalore. Rural group were patients reporting to 5 rural centres in Bailoor, Firangipet, Hejimadi, Mundkooor and Nitte. Patients who were selected randomly, were segregated in six groups based on age between 15 years to 66 years.

Exclusion Criteria

- 1) Patients with recent maxillofacial trauma.
- 2) Patients with limited mouth opening

Inclusion Criteria

1. Patient above the age group of 15years
2. Patient who are not physically or mentally challenged.

All the patients were informed about the nature of the survey, its objectives and were ensured complete confidentiality of their information. A written informed consent was taken. A standardized questionnaire was prepared according to WHO health assessment form 2013 which was filled by the examiner.

Clinical Examination:

Each patient was examined for anterior tooth fracture on the dental chair in a good illumination of light using sterilized mouth mirror, explorer, and tweezers. The Patients who had fractured anterior teeth due to trauma were questioned with a standard questionnaire format to find

its relation associated with age, gender, location, occupation, etiology, anterior tooth fracture classified according to WHO format, molar relationship according to Angles classification.

Scoring criteria: WHO scoring criteria -2013

Teeth affected by dental trauma were coded as follows:

- 0 = No sign of injury
- 1 = Treated injury
- 2 = Enamel fracture only (Plate 47)
- 3 = Enamel and dentine fracture (Plate 48)
- 4 = Pulp involvement (Plate 49)
- 5 = Missing tooth due to trauma (Plate 50)
- 6 = Other damage
- 9 = Excluded tooth

All completed questionnaires were analyzed and the data was transferred on the Microsoft Office Excel sheet and subjected to SPSS version 16 to statistically analyze using Pearson Chi-square test. P < 0.05 was considered to be statistically significant

RESULTS:

The sample size of this study included 2000 patients. Out of 2000 patients, 404 (20.2%) cases [Table 1] had anterior tooth fracture due to trauma. Out of 404 cases with anterior tooth fracture due to trauma, 56.8% cases were seen in urban centers and 43.2% cases were seen in rural areas. 56.9% cases affected were males and 43.1% of cases affected were females. 34.7% of cases were noticed in the age group of 36-45 years of age and 24.8 % of cases [Table 2] were seen in the age group of 26-35 years. 38.4% of the cases were seen among workers, 20.6% of cases were seen among house wives. With respect to type of tooth fracture, 44.7% of teeth showed WHO score 3 - enamel and dentine fracture, followed by WHO score 2 was seen in 33.6% of cases and rest 22% cases included WHO score 4 and 6. With respect to etiology of trauma, 84.6% were because of fall and rest 15.4% [Table 3] of patients had anterior tooth fracture because of violence, sports and road traffic accidents with slight variation in frequency and percentage. Furthermore, the prevalence of anterior tooth fracture due to trauma with respect to molar relationship, 56.9% cases were seen with class 2 molar relation and 43.1% of cases[Figure 1] were seen with class 1 molar relation.

Table 1: Overall prevalence of anterior tooth fracture due to trauma

	Overall prevalence
Anterior tooth fracture	Frequency(%)
Yes	404(20.2%)
No	1596(79.8%)
Total	2000(100.0%)

Table 2: Anterior tooth fracture in different age groups

Age group	Frequency(%)
15-25 years	44(10.9%)
26-35 years	100(24.8%)
36-45 years	140(34.7%)
46-55 years	20(5.0%)
56-65 years	40(9.9%)
Above 66 years	60(14.9%)
Total	404(100.0%)

Chi-square value 66.98(5), p< 0.001*

*p<0.05 statistically significant

p>0.05 non significant, NS

Table 3: Etiology of anterior tooth fracture

Cause	Frequency
Falls	342 (84.6%)
Sports accident	29 (7.2%)
Automobile accident	20 (4.9%)
Voilence	13 (3.2%)
Total	404 (100.0%)

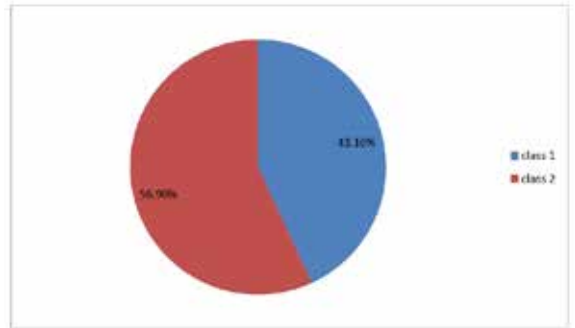


Figure 1: Anterior tooth fracture with respect to molar relationship.

DISCUSSION:

In the present study it was observed that the overall prevalence of anterior tooth fracture due to trauma was 20.2% in 2000 patients of Southwest coastal population of India [table 1]. In a study conducted by Mithra et al⁹ in the same geographical location during the year 2010-2011, the overall prevalence was about 11.5% and in another study conducted by Hegde et al²² in the same geographical location during the year 2013, the overall prevalence was about 14.85% which shows an increase in the prevalence of anterior tooth fracture due to trauma.

Among the urban and the rural population, the urban population showed higher prevalence of anterior tooth fracture which is similar to the results of the study conducted by Hegde et al²² in 2013. It could be because of the fact that urban population are more prone to accidents from work centers and road traffic accidents than the rural population. Among the different occupation groups, workers had a high prevalence of anterior tooth fracture (38.4 %), this may be due to the fact that workers are more prone for occupational hazards.

The prevalence of anterior teeth fracture with respect to gender was found to be greater in males(56.9%). Similar results were reported by Hegde et al²¹ in their study in the same geographic location and in different locations i.e in Brazil by Caldas and Burgos⁸ and in Pilsen, (The Czech Republic) by Hecova et al¹⁶. Men are more prone for accidental injuries and sports injuries as they are physically more active than women and involve more in outdoor activities.

Maximum prevalence of anterior tooth fracture was seen in the age group of 36 -45 years (34.7%) followed by 26 -35 years (24.8%). It is similar to the results of previous study conducted by Hegde et al²¹ in the year 2014 in the same population, however the result of previous study conducted by Hegde and Shabin⁹ in the same geographical location during the year 2010 -2011 was not similar which

showed the maximum prevalence of anterior tooth fracture in the age group of 41 – 50 years.

Among the different etiological factors, prevalence of anterior tooth fracture occurred mostly because of fall (84.6%) [Table 3], similar findings were observed by Hegde and Sajjani²², Caldas and Burgos⁸ in Brazil, Levin et al¹⁵ in Israel, Lam et al¹³ in Australia and Bucher et al²⁰ in Germany. When different types of fracture of teeth were compared, fracture involving enamel and dentin (44.7%) followed by only enamel fracture was seen in 33.6 % , this is in accordance with the studies by Bucher et al²⁰ but not similar to the studies conducted by Caldos and Burgos⁸ in Brazil and Navbazam and Farhani¹ in Iran.

Taking molar relationship into consideration , prevalence of anterior tooth fracture occurred most frequently among patients with Class II molar relationship (56.9%) and the rest being class I molar relationship (43.1%)[Fig 1]. This is similar to the results by Hegde and Sajjani²². The high prevalence of anterior tooth fracture in Class II molar relation may be due to the fact that in class II division 1 malocclusion, the upper anterior teeth are proclined and more prone for fracture.

CONCLUSION:

In the present study, we noticed that the urban population were more prone to anterior tooth fracture due to trauma than the rural population. Fall was the most frequent cause of tooth fracture among other causes like automobile injuries, sport injuries and violence. Males had higher prevalence than the females. Among the different types of fractures, the one involving enamel and dentine was most common. Furthermore, individuals with Angle's class II molar relation showed higher prevalence of anterior tooth fracture.

References:

1. Navabazam A, Farahani SS. Prevalence of traumatic injuries to maxillary permanent teeth in 9 to 14 years old school children in Yazd, Iran. *Dental Traumatol.* 2009;26:154-157.
2. Dietschi D, Jacoby T, Dietschi JM, Schatz JP. Treatment of traumatic injuries in the front teeth. Restorative aspects in crown fractures. *Pract Periodontics Aesthet Dent* 2000;12:751 -8.
3. Shulman JD, Peterson J. The association between incisor trauma and occlusal characteristics in individuals 8 -50 years of age. *Dent Traumatol* 2004;20:67-74.
4. Glendor U. Aetiology and risk factors related to traumatic dental injuries – a review of literature. *Dent Traumatol.* 2009;25:19-31
5. Diaz JA, Bustos L, Brandt AC, Fernandez BE. Dental injuries among children and adolescents aged 1- 15 years attending public hospital in Temuco, Chile. *Dent Traumatol* 2010;26:254-61.
6. Andreason JO, Andreason FM. Textbook and color atlas of traumatic injuries to teeth, ed 3. Copenhagen. Munksgaard publishers, 1994.
7. Marcenos W, Al beiruti, Tayfour D, Issa S- Epidemiology of traumatic injuries to the permanent incisors of 9-12 year old school children in Damascus, Syria. *Dental Traumatology* 1999; 15:117-23
8. Caldas AF, Jr, Burgos ME. A retrospective study of traumatic dental injuries in a Brazilian dental trauma clinic. *Dental Traumatol* 2001;17:250 -253.
9. Mithra N Hegde, Shabin S. Incidence of permanent anterior tooth fracture due to trauma in south Indian population. *Indian Journal of dental traumatology* 2013; 4(4): 120-24
10. Glendor U. Epidemiology of traumatic dental injuries- a 12 year review of the literature. *Dental traumatology* 2008; 24: 603-611
11. Marcenos W, Al beiruti, Tayfour D, Issa S- Epidemiology of traumatic injuries to the permanent incisors of 9-12 year old school children in Damascus, Syria. *Dental Traumatology* 1999; 15:117-23
12. Mónika Kovács, Mariana Păcurar, Blanka Petcu, Csilla Bukhari -Prevalence

- of Traumatic Dental Injuries in Children Who Attended Two Dental Clinics in Târgu Mure Between 2003 and 2011. *Dental traumatology* 2012;11(3): 116-12
13. Raymond Lam, Christopher Lloyd, Carmel Lloyd, Estie Kruger, Mare Tennant- Dental trauma in an Australian rural center- *Dental Traumatology* 2008; 24: 663-670
14. Rafeala Armarante Andrade, Patricia Louise Scabeli, Evans, Anne Louise scabell Almeida, Juliana de Jesus Rodrigues dasilva – Prevalence of dental trauma in Pan American Games athletes- *Dental Traumatology* 2010; 26: 248-253.
15. Liren Levin, shaul Lin, Sharon Goldman, Kobi Peleg – Relationship between socio-economic position and general maxillofacial and dental trauma : A National Trauma Register study- *Dental Traumatology* 2010; 26: 342-345
16. Hana Hecova , Vasileois Tzigkounakis, Vlasta Merglova , Jan Netolicky- A Retrospective study of 889 injured permanent teeth – *Dental traumatology* 2010; 26: 466-475
17. Zuhair K. Dent – Traumatic injuries of the permanent incisors in children in southern Turkey – A retrospective study. *Dental Traumatology* 2005 feb ;21; (1): 20-25
18. Hana Hecova , Vasileois Tzigkounakis, Vlasta Merglova , Jan Netolicky- A Retrospective study of 889 injured permanent teeth – *Dental traumatology* 2010; 26: 466-475
19. Comfort A, Adekoya S, Olufemi A, Wakeel O, Adeleke O, Vincent I. Prevalence and causes of fractured permanent incisors in 12 year old suburban Nigerian school children. *Dental Traumatology* 2009; 25: 314-317
20. Bucher Katharina , Neumann Claudia, Hickel Reinhard, Kuhnisch Jan- Traumatic dental injuries at a German University clinic 2004-2008. *Dental Traumatology* 2013; 29: 127-133.
21. Mithra N Hegde, Shaheen Abootty, Shruthi Attavar. Prevalence of anterior tooth fracture due to trauma. *World Journal of Dentistry*, April-June 2015;6(2):77-81.
22. Hegde MN, Sajjani AR. Prevalence of permanent anterior tooth fracture due to trauma in South Indian population. *Eur J Gen Dent* 2015;4:87-91.