



Dental Trauma: A Painful Experience for the Paediatric Population from a Pediatric Dentist's Point of view

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Abstract:

A child's general health is ensured by various sorts of physical activities but none of these activities should cause any difficulties or either hampers their growth and development. The most important aspect to these being the wellbeing of oral health of kids from sudden injuries which most of the times is overlooked by both the parents, caretakers or pediatricians'. Trauma may massively impact the psychological health of the adolescents as well. There comes the role of an Oro-Dental Specialist, who can draw a margin between the distress and difficulties faced by the pediatric patients due to such fatalities and also spread awareness among the parents. Preventive therapeutic steps help to depicture the current scenario and help provide a better life for future generations.

Keywords: Traumatic Dental Injuries, Anterior teeth, Oral Health, Complications.

Introduction

Trauma to oral cavity is most commonly seen in children. Global studies have provided considerable statistical data regarding, an increased frequency of "traumatic dental injuries" (TDIs) in toddlers and teenagers, that indicates a significant general problem pertaining to oral health¹⁻⁶. Fractures of anterior teeth, that reports the maximum discrepancies, results in both operable and aesthetic, therefore psychological outcomes³. Potential dental sequel may comprise pulp mortality, root canal obliteration, resorption, tooth staining, marginal alveolar bone depletion or abscess development.^{1,2}

The prime sources of trauma were reported as falls and hits with other fellow mates during outdoor activities^{5,6}. The anatomical considerations such as incisor protuberance and insufficient lip coverage are described as common predisposing factors⁷. Most of these accidental traumas occur at the residences, due to falls⁸⁻¹⁰. Fracture of tooth crown with/without affecting pulp is mainly observed in the deciduous dentition¹¹⁻¹³ and luxations (intrusive) and/or avulsions in the permanent dentition¹⁴⁻¹⁶. A direct association between the severity of anatomic and mineralization disfigurement, may have an

impact upon the permanent dental germ, as a result of the sort of trauma to a primary dentition vs. the stage of maturity of the permanent tooth sac¹⁷.

Now the fact that a whole lot of children who face these traumatic injuries have to undergo a lot of psychological and physical hardships both. Thus keeping this aspect of the treatment in mind, can help both the care providers and parents to deal with the children in a more holistic way, which will not only help them to cope up with the after effects of such injuries but also boost their activities in a much better way. Even though a lot of evidence can be cited regarding the goodwill of treatment in improving children's good health after a 'TDI', Pediatric specialty for trauma still needs to master a lot more. Our Priority must be placed upon achieving adequate treatment oriented outcome which promises a proper evaluation of the care provided by us. Further quality-enriched research is required, particularly featuring the adolescents, to let the clinicians ponder and think about such patients' experiences and perspectives and thus pave way to bring a significant change over their entire life time and play a significant role in providing adequate treatment¹⁸.

Epidemiology

Every year a minimum of not less than a four trillion people die due to accidents, mostly in their first to second decades, in turn taking a toll upon the life of people in their forties primarily¹⁹. Besides, each passing year witnesses a lot many casualties (being injured) due to the same. "Trauma" possesses an assemblage of repercussion to not only the victims but even their kin and the community as a whole. Ramifications are much more than only 'physical', 'emotional' and 'monetary' too. "Trauma" to the oral cavity and the peri-oral tissues are recurrently observed during the first ten years of a child's

life, with a down fall slowly as their age advances and the least being observed when they reach thirties but on the other hand, lacerations or wounds to the other body parts continue to occur even after that. Admitting to the fact that buccal cavity and its related structures, make up only one percent of our whole bodily structures though ends up sharing a good five percent of total physical injuries. In kindergarten children, as much as seventeen percent of these injuries belong to the pharyngeal cavity while head injuries make it to the top. The fractures and lacerations of the upper and lower extremities being most common as they grow up^{20,21}. The children affected with "trauma" of the buccal region also present with sore of different neighboring tissues as well. Injuries in such patients, pertaining to dental origin are the maximum (about ninety-three percent) followed by that of the "soft tissues" (about twenty eight percent) and the least being fragmentation of the jaws (about six percent)^{21,22}. Any event of "traumatic dental injury" can be expressed in connection with "prevalence" & "incidence". "Prevalence" considers each and every past and present cases occurring in a community at any one time interval, at the same time "incidence" describes only the present cases being registered freshly during a specified time period that is usually an year. Thus making the "prevalence" rate always more than "incidence". In case we put it differently, "incidence" informs us about the probability of any incident whereas "prevalence" presents before us the extensiveness of the occurrence. A most recent study by Singh B et al , in the year 2018, in Bhubaneswar, Odisha done among 2518 adolescents (12-15 years) has clearly stated the "prevalence" of such oral accidents to be 17.4 % with males being more injured (2079), than girls (440). The study, also stated that "enamel fracture" was frequently occurring injury

(61.95%), than "Enamel & dentin fracture" (24.39%) and injury affecting the pulp in 13.7%. Children around twelve years of age showed maximum dental fragmentations and pulp involvements (48.30%) and the "TDIs" occur lesser in number with advancing age.²³ Scandinavia and United Kingdom has maintained a constant number of the accidental injuries to the oral cavity for the past thirty years^{24,25-28}. Surveys conducted in the United Nations has reported every one in four individual suffer from trauma incisally whereas Canadians exhibit a very high frequency of 16% traumatic incidents among adolescents and middle aged nationalities.²⁸⁻²⁹

Aetiology

Universally The number one cause of any sort of injuries (that may or may not result in death) are "RTAs", in this era of rapid development, which follows the trend as was seen few years back, all around the world. Though strict adherence to traffic rules has lead to a sufficient decrease in the medico-legal cases seen , now a days but still the burden of oro-facial fractures pose a threat to the entire medical fraternity as a whole. In recent times many of the nations have been quite successful in reducing the mortality rate due to "RTAs". The prime location of injury to both the toddlers and the grown-up children has been reported as their place of stay, then the second most reported being educational institutes. In spite of this, the various other places of occurrence of these injuries were simultaneously sports complexes, school play forums and pavements. Elsewhere the main causes of injuries in the adult teeth were none other than falls during games and contact sports in the fields. Various domestic sports like "rugby", "judo", "ice-hockey", "football" etc. that tend to engage & entangle the participants, mostly lead to high grade tussle

resulting in various physical assaults. Moreover fights, being hit by any hard substances, motorized vehicle tragedies, have been mentioned to add on to these sorts of casualties, in various other scientific literatures available. Apart from all these a very important cause of deciduous teeth injury is "Child abuse and child neglect". "Warren et al". has stated that no less than 1/3rd of abrasions result from assaults during playing in grounds, leading to fall headlong and injuries. Regional dissimilarities comprise of circumstances, lifestyle, approach & traditions. Nigerian studies have revealed that the maximum cases of traumatic insults result mainly due to the caretakers of the toddlers narrowly elder to them, which adds to sheer negligence and such incidents^{30,31}. A study conducted in Australia by "Lam et al" stated that the dental mishaps were more seen in children aged two to four years and then in the age group ten to fourteen years, which is in co-ordination with other studies sharing the same result, where persons with hyper mobility and younger age are the main target population³². Additional distinctive conditions apart from usual dental features have also been given equal gravitas, like "increased overjet, labial coverage, Incisal protrusion in Class II malocclusion". Also a connection between weight issues and features of dentition gives variegated results. According to a study done by Juneja P et al in Central part of India, among "8-15 years" of children, stumbling was the main culprit of accidental trauma (55.5%) for maximum individuals. All the individuals with overjet of "3 mm or more", i.e "13.2%" of them encountered "TDI", in comparison to "9.7%" with "TDI" manifesting an overjet "below 3 mm", clearly showing that those with increased maxillary arch angulation and thus decreased lip coverage are definitely more prone to injuries than the ones with lesser maxillary arch angulation and adequate

labial coverage³³. Another study by Ravishankar LT³³ et al, conducted in Davangere stated similar kind of findings in a population aged twelve years. A similar kind of study stating the risk components in individuals aged "12-15" year old males of the country indicates, the relationship of happening of front teeth trauma and labial coverage and also with upper arch overjet were found to be significant statistically. Among lower "SES" group 14.2% witnessed front teeth injuries compared to 15.3% in higher SES group. While only 7.4% of people with sufficient labial coverage had faced injury, almost 40% of them with insufficient labial coverage had front teeth injuries. While 9% of subjects with a normal overjet & 21% of them with an enhanced overjet "3.5–5.5 mm" experienced hurt and 33% within those with an overjet of >5.5 mm had witnessed these injuries. Labial coverage being pointed out the impactful anticipating factor for manifestation of anterior teeth contusions. An individual with insufficient labial coverage has 7.3fold higher possibility of encountering with front teeth injury than another with sufficient labial coverage³⁴.

Sequelae of trauma to deciduous dentition

Deciduous and successive permanent teeth ought to be regarded as interrelated elements, as every other one communicates as well as rely upon one another. Such correlation can be hampered by means of direct traumatic impacts or as a repercussion of earlier insults. This disrupted "haemostasis" from a constituent effects the near most dental component as well as the other surrounding structures to a variably different degrees depending upon the nature of the impact. Injury to the milk teeth can irritate/ disrupt the developmental process of the future successive dentition to a extent of 13 -70% cases. These adaptations may come about at the time of injury as result of the strength of

the knock itself, either atop the osseous matter/long lasting dental bud or because of culmination of instinctive impact from apical region of milk dentition upon the successors. Disharmony dealt with at intermediate or continuing period resulting from after-shock follow-ups must be considered too. The fact that an unswerving interconnection of the seriousness regarding philologic and calcification adjustments, that might disrupt the successor dental bud, by the form of injury to the dental components i.e. a primary tooth & stages of formation of the long lasting successor bud. "Intrusive luxation" and "avulsion" are liable for the largest disturbances in permanent tooth development, just after that are "extrusive luxation" and "lateral luxation". As an abuse to the dentition falls out& appears in a premature age i.e. day 1 to the fourth year of a child's life, the proportion of successive teeth malformed on account of both outline features or calcification levels might increase by double fold. The density of such disharmonious instances decrease with age passing by. Jaw bone disintegrations & surgical strategies executed as therapeutic measures may also influence the formative stages of permanent dental structures. Literature manifests a span of cases which may include the "permanent successor tooth", presenting with:

1. Slightest enamel muddiness or opaqueness
2. Hypoplasia and hypomineralization, with white to brown patches,
3. Crown dismemberment
4. Deformities - odontoma, replication by doubling, disrupted angles and dilacerations of the radicular portions of teeth, arrest of radix development.
5. Germ separation
6. Abnormal eruption (pertaining to bizarre sites of eruption)

7. Impacted or Submerged Successor teeth^{35,36} and so on.

Conclusion

The traumatic episodes not only affect the kids but the complete family. It affects the developing psyche of the child. It not only shakes the confidence of a child but also costs them a huge part of their quality of life. Parents should strive to take all necessary measures to intercept these accidental conditions by taking good care of their oral health and seek professional help by attending regular oral health checkups. Moreover the preventive measures should be taken as and when indicated. These traumatic dental injuries can be very taxing for the adolescents as well so understanding their interests and at the same time encourage them to protect their oro-facial region, most importantly while participating in sports and recreational activities.

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