# FREQUENCY, PATTERN, AND MANAGEMENT OF DENTOALVEOLAR TRAUMA IN PEDIATRIC PATIENTS

Fareeha Fatima[1], Muhammad Tariq Khan[2], Shahkar Zaman[2], Mehran Khan[1], Hanif Ullah[3], Ismail[3]

**How to cite this article**

Fatima F, Khan MT, Zaman S, Khan M, Ullah H, Ismail. Frequency, Pattern, and Management of Dentoalveolar Trauma in Pediatric Patients. J Gandhara Med Dent Sci. 2026;13(3):35-40. https://doi.org/10.37762/jgmds.13-3.859

**Date of Submission: 30-01-2026**
**Date Revised: 08-06-2026**
**Date Acceptance: 09-06-2026**

[2]Professor, Department of Oral and Maxillofacial Surgery, Saidu College of Dentistry, Swat
[3]Assistant Professor, Department of Oral and Maxillofacial Surgery, Saidu College of Dentistry, Swat

**Correspondence**

[1]Fareeha Fatima, Postgraduate Resident, Department of Oral and Maxillofacial Surgery, Saidu College of Dentistry, Swat
: +92-346-9362730
: Fareehafatima1155@gmail.com

***ABSTRACT***

***OBJECTIVES***

*This study aimed to determine the frequency, pattern, and management of dentoalveolar trauma in pediatric patients.*

***METHODOLOGY***

*This descriptive cross-sectional study was conducted at the Oral and Maxillofacial Surgery department of Saidu Dental Hospital, Swat. A total of 166 pediatric patients aged 2 to 12 years with maxillofacial trauma were included through non-probability consecutive sampling. Patients with jaw fractures, epilepsy, mental disabilities, or delayed presentation beyond 12 hours were excluded. Clinical and radiographic assessments confirmed dentoalveolar trauma. Data on trauma patterns and management strategies were collected and stratified by age and gender. Post-stratification chi-square tests were used to assess associations.*

***RESULTS***

*The mean age of participants was 7.47 years (SD ± 2.95), with 57 females (34.34%) and 109 males (65.66%). Dentoalveolar trauma was observed in 50% of cases. Luxation was the most common injury (25.9%), followed by crown infraction (10.2%) and avulsion (9.0%). The most frequent management approach was splinting (31.3%), followed by conservative management (9.6%). Closed and open reduction with fixation were less common. There was no significant difference in trauma type or treatment method between genders (p=0.66 and p=0.98, respectively) or age groups (p=0.81 and p=0.63, respectively).*

***CONCLUSION***

*Half of the pediatric patients with facial trauma presented with dentoalveolar injuries. Luxation was the most common injury pattern, and splinting was the most commonly used treatment. No significant gender- or age-based differences were found in trauma patterns or management approaches.*

***KEYWORDS:*** *Adolescent, Child, Facial Bones Injuries, Maxillofacial Injuries, Splints, Tooth Luxation, Wounds and Injuries*

## INTRODUCTION

Dentoalveolar trauma refers to damage involving the dentition, supporting alveolar structures of the upper and lower jaws, and adjacent oral tissues. Frequently seen in children due to accidents or physical activities, such injuries may result in complications like pulpal death, tooth displacement, and growth disturbances. They can also impair articulation, oral function, and psychological well-being, highlighting the importance of timely assessment and effective treatment in pediatric dental practice.[1] This can cause pain and discomfort that makes it hard for kids to eat, talk, or even sleep properly. On top of that, they might start feeling embarrassed or self-conscious about how they look, which can make them avoid smiling or laughing around others. Over time, this can affect their confidence and make it harder for them to connect with friends or enjoy social situations.[2] In pediatric maxillofacial trauma, soft tissue injuries and dental damage are more common than bone fractures. Soft tissues and developing teeth in children make them more prone to cuts, bruises, and tooth injuries. Bone fractures, while less frequent, usually affect the more flexible parts of the face, like the maxilla and mandible.[3] It is reported that males are more likely to experience trauma than females. Common causes include falls, altercations, sports, accidents, and collisions with objects or people.[4,5] The most common places for dental injuries are the home, school, and street, with enamel fractures and enamel-dentin fractures without pulp involvement being the most common types.[5] Dentoalveolar injuries commonly occur due to accidents and violence and may involve tooth avulsion, tooth fractures, fractures of the alveolar process, and soft tissue tears. [6] Unlike other hard tissue injuries, tooth enamel cannot regenerate or heal. The Andreasen dental trauma classification system offers a structured approach to categorize these injuries, ranging

from minor enamel fractures to more complicated cases involving exposure of the dental pulp. For example, uncomplicated crown fractures and crown infractions include fractures of the enamel and dentin with varying degrees of pulp involvement, while complicated crown-root fractures extend injury to both the cementum and dental pulp. [7] The International Association of Dental Traumatology (IADT) suggests a clear and organized approach to handling dentoalveolar trauma. It starts with quickly assessing the injury, classifying it, taking X-rays, and stabilizing the tooth with a splint. Treatment, such as apexogenesis or root canal therapy, depends on whether the pulp is exposed and on the tooth's maturity. Regular check-ups are important to monitor healing, ensure the tooth is still alive, and confirm the splint is holding. The IADT also stresses the importance of preventive care, thorough documentation, and working with other specialists when dealing with more complex cases to achieve the best results.[8] A previous study reported that out of 303 teeth, the most prevalent type of injury observed was enamel fracture, accounting for 220 cases (72.60% of total). Enamel and dentine fractures were the second most common, with 58 instances (19.14% of total). Injuries involving pulp, indicating more extensive damage, were observed in 14 cases (4.62% of total). Additionally, 11 cases (3.63% of the total) were missing due to trauma.[9] The pattern of pediatric dentoalveolar trauma and its management is different from that of adults. The study of the frequency, pattern, and management of dentoalveolar trauma in pediatric patients is crucial due to its impact on public health and children's well-being. Dental injuries are common in children, and understanding their prevalence and causes helps prevent them. Ultimately, it addresses knowledge gaps and contributes to evidence-based practices in pediatric dental trauma care. The objective of this study was to determine the frequency, pattern, and management of dentoalveolar trauma in pediatric patients.

## METHODOLOGY

This descriptive cross-sectional study used a nonprobability, consecutive sampling technique at the Oral and Maxillofacial Surgery department of Saidu Dental Hospital, Swat, from September 21, 2024, to April 5, 2025. The sample size was determined using OpenEpi software, yielding 166 participants with a 95% confidence interval and a 6% margin of error. The sample size calculation was based on a previous study that reported a 19.14% proportion of enamel and dentine fractures among dentoalveolar fractures.[9] Only children presenting within 12 hours of injury were included to allow standardized clinical and radiographic evaluation before significant swelling or secondary tissue changes obscured the diagnosis of dentoalveolar injuries. To minimize selection bias, all consecutive eligible patients presenting during the study period were enrolled regardless of age, gender, injury mechanism, or injury severity. Both clinical and radiographic assessments were done to confirm eligibility. Children were excluded if they had epilepsy, as it would make assessment harder, and they are more likely to experience falls and trauma. Mentally disabled children were also excluded, along with those who presented late and showed facial swelling during the clinical exam, as this would make it difficult to assess the injury properly. Approval from the research and ethics committee of the hospital (119-ERB/023, dated: 06/10/023) and CPSP was obtained. All patients presenting with dental-alveolar fractures and meeting our inclusion and exclusion criteria were included in this study from the OPD of oral and maxillofacial surgery. Informed consent was obtained from the patients after explaining the study protocol and research purpose. They were assured of the confidentiality of their personal and other data collected. A detailed history was taken from the patients, followed by an appropriate relevant clinical examination. The clinical examination began with a visual inspection of the face and surrounding structures to identify any obvious deformities, asymmetries, swelling, bruising, or lacerations. Palpation was conducted gently to detect any tenderness, crepitus (grating sensation), instability, or abnormal movement suggestive of fractures or dislocations. The nasal examination evaluated the nasal airway patency, septal deviation, and presence of any deformity or tenderness over the nasal bones, which may have indicated a nasal fracture. Intraoral examination involved inspecting the oral cavity, including the teeth, gums, palate, and mucosa, for lacerations, avulsions, fractures, or other injuries. Radiological examination was carried out in the form of periapical, panoramic, and computed tomography scans to assess the presence of dentoalveolar fractures. The pattern of dentoalveolar trauma was assessed clinically, with fractures of the alveolar bone being palpable with a finger and/or tooth luxation in any direction, confirmed by plain radiographs such as panoramic radiographs. In selected cases, the consultant maxillofacial surgeon advised a CT scan to confirm the diagnosis. The patterns included the following: Crown infraction, which involved an incomplete fracture of the enamel; uncomplicated crown fracture, where the dentin and/or enamel were fractured, but the pulp remained unaffected; complicated crown fracture, which extended through the enamel and dentin, exposing the pulp; uncomplicated crown-root fracture, where the fracture extended through the enamel, dentin, and cementum, but the pulp remained unexposed; complicated crown-root fracture, similar to the previous

type but with pulp exposure; root fracture, which affected the dentin, cementum, and pulp; avulsion, which was the complete dislodgement of a tooth from its socket during trauma; and luxation, where the tooth was displaced from its original position in the alveolus without complete avulsion, resulting from acute trauma in either a lateral or vertical direction. The management options for dentoalveolar injuries included conservative treatment and splinting. Conservative management was used for minor injuries such as crown infractions and uncomplicated crown fractures that did not require stabilization. Splinting was performed for dentoalveolar fractures, luxation injuries, and selected root fractures to stabilize the affected teeth and alveolar segment and facilitate healing. Additional treatment, including repositioning of displaced teeth and appropriate restorative procedures, was provided based on the type and severity of the injury. Splinting was performed for dentoalveolar fractures, luxation injuries, and selected root fractures requiring stabilization. The splint was used to immobilize the affected teeth and alveolar segment to facilitate healing and restore function. Management of dentoalveolar injuries included conservative treatment and splinting, depending on the type and severity of injury. Splinting was used to stabilize luxated teeth, dentoalveolar fractures, and selected root fractures, facilitating healing and restoring function. Conservative management was done for stable fractures, such as zygomatic fractures. Closed reduction and fixation were done for fractures such as those in the mandibular body or symphysis. The fractured or dislocated bone was manipulated back into its normal position without an open incision. Open reduction and fixation were done for grossly displaced fractures that could not be reduced without an incision. An incision was made to access the fractured or dislocated bone directly. Data was analyzed using SPSS version 20.0. Frequencies and percentages were obtained for all categorical variables, including gender, dentoalveolar (yes/no), and management options, while age was presented as mean ± standard deviation (or median with IQR for skewed data assessed using the Shapiro test or histogram). Age groups and gender stratified the frequency of dentoalveolar fractures and management options to observe effect modification. Post-stratification chi-square tests were used, with $P \leq 0.05$ considered significant. When the chi-square assumption was violated, Fisher's exact test was used.

## RESULTS

The study sample (n = 166) had a mean age of 7.47 years and a standard deviation of 2.95. Regarding gender distribution, 57 subjects (34.34%) were female, and 109 subjects (65.66%) were male, with the most common age group being 6-12 years (n=118, 71.08%). Dentoalveolar trauma was found in 50% among all facial fractures (Fig 1). The most common pattern of dentoalveolar trauma was luxation (n = 43, 25.9%), followed by crown infraction (n = 17, 10.2%). Avulsion occurred in (n = 15, 9.0%), while 83 subjects (50.0%) had other facial fractures, not dentoalveolar trauma. The most common management approach was splinting (n = 52, 31.3%), followed by conservative management (n = 16, 9.6%). Closed reduction and fixation were used in (n = 11, 6.6%), and open reduction and fixation were performed in (n = 4, 2.4%). (Table 1). There was no significant difference between females and males in trauma type (p=0.66) or management approach (p=0.98). Luxation was the most common injury in both groups (24.6% in females, 26.6% in males). Avulsions and crown infractions were similarly distributed, while complicated crown fractures occurred only in males. Splinting was the most frequent treatment in both sexes (33.3% in females, 30.3% in males). Conservative and closed reduction methods were used at similar rates. About half of both groups had facial fractures without dentoalveolar trauma. (Table 2). No significant differences were found between the age groups in trauma pattern (p=0.81) or management (p=0.63). Luxation was the most common injury in both groups, occurring in 20.8% of 2-5-year-olds and 28.0% of 6-12-year-olds. Avulsion was more frequent in the younger group (12.5% vs 7.6%), while crown infractions were slightly more common in the older group (11.0%). Splinting was the most frequent treatment in both age groups, particularly among 6-12-year-olds (33.9%). Conservative and closed reduction approaches were used at similar rates. Over half (56.3%) of the younger group and nearly half (47.5%) of the older group presented with other facial fractures without dentoalveolar trauma. (Table 3)

**Figure 1: Frequency of Dentoalveolar Trauma**

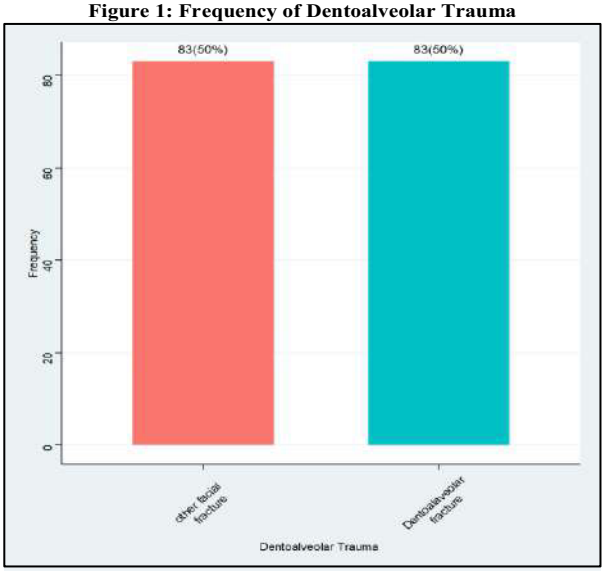

**Table 1: Pattern and Management Approaches in Dentoalveolar Trauma**

| | Characteristic | N = 166 |
|---|---|---|
| **Pattern of dentoalveolar trauma** | Avulsion | 15 (9.04) |
| | Complicated Crown-Root Fracture | 03 (1.81) |
| | Complicated Crown Fracture | 03 (1.81) |
| | Crown Infraction | 17 (10.24) |
| | Luxation | 43 (25.90) |
| | No dentoalveolar trauma (other facial fracture ) | 83 (50.00) |
| | Uncomplicated Crown-Root Fracture | 01 (0.60) |
| | Uncomplicated Crown Fracture | 01 (0.60) |
| **Management of dento-alveolar trauma** | Closed reduction and fixation | 11 (6.63) |
| | Conservative | 16 (9.64) |
| | Open reduction and fixation | 04 (2.41) |
| | Splinting | 52 (31.33) |
| | No dentoalveolar trauma (other facial fracture ) | 83 (50.00) |

**Table 2: Pattern and Management Approaches in Dentoalveolar Trauma Stratified by Gender**

| | Characteristic | Female, N = 57 | Male, N = 109 | P-Value* |
|---|---|---|---|---|
| **Pattern of dento-alveolar trauma** | Avulsion | 06 (10.53) | 09(8.26) | 0.66 |
| | Complicated Crown-Root Fracture | 02 (3.51) | 01(0.92) | |
| | Complicated Crown Fracture | 00 (0.00) | 03(2.75) | |
| | Crown Infraction | 06 (10.53) | 11(10.09) | |
| | Luxation | 14 (24.56) | 29(26.61) | |
| | Uncomplicated Crown-Root Fracture | 01 (1.75) | 00(0.00) | |
| | Uncomplicated Crown Fracture | 00 (0.00) | 01(0.92) | |
| | No dentoalveolar trauma (other facial fracture ) | 28 (49.12) | 55(50.46) | |
| **Management of dento-alveolar trauma** | Closed reduction and fixation | 03 (5.26) | 08(7.34) | 0.98 |
| | Conservative | 06 (10.53) | 10(9.17) | |
| | Open reduction and fixation | 01 (1.75) | 03(2.75) | |
| | Splinting | 19 (33.33) | 33(30.28) | |
| | No dentoalveolar trauma (other facial fracture ) | 28 (49.12) | 55(50.46) | |

*Fisher's exact test

**Table 3: Pattern and Management Approaches in Dentoalveolar Trauma Stratified By Age Groups**

| Characteristic | 2-5 yr, N = 48 | 6-12 yrs, N=118 | P-Value |
|---|---|---|---|
| **Pattern of dentoalveolar trauma** | | | |
| Avulsion | 06 (12.50) | 09 (7.63) | 0.81 |
| Complicated Crown-Root Fracture | 00 (0.00) | 03 (2.54) | |
| Complicated Crown Fracture | 01 (2.08) | 02 (1.69) | |
| Crown Infraction | 04 (8.33) | 13 (11.02) | |
| Luxation | 10 (20.83) | 33 (27.97) | |
| Uncomplicated Crown-Root Fracture | 00 (0.00) | 01 (0.85) | |
| Uncomplicated Crown Fracture | 00 (0.00) | 01 (0.85) | |
| No dentoalveolar trauma (other facial fracture ) | 27 (56.25) | 56 (47.46) | |
| **Management of dento-alveolar trauma** | | | |
| Closed reduction and fixation | 02 (4.17) | 09 (7.63) | 0.63 |
| Conservative | 06 (12.50) | 10 (8.47) | |
| Open reduction and fixation | 01 (2.08) | 03 (2.54) | |
| Splinting | 12 (25.00) | 40 (33.90) | |
| No dentoalveolar trauma (other facial fracture ) | 27 (56.25) | 56 (47.46) | |

## DISCUSSION

In our study, males accounted for 65.66% of cases, consistent with the findings of Patidar et al., who reported a male-to-female ratio of approximately 2:1 in pediatric dental trauma cases.[2] This male predominance is often attributed to higher engagement in physical activities and risk-prone behaviors among boys. The majority of trauma cases (71.08%) occurred in the 6-12-year age group, which corresponds with the mixed dentition phase. This is consistent with Patidar et al.'s observation that the permanent dentition group (12-16 years) had the highest frequency of dental trauma.[10] The increased mobility and participation in outdoor activities during these developmental stages likely contribute to the higher incidence.[11] Half of the facial fractures were dentoalveolar trauma - this is how common these injuries are in children. Luxation injuries were the most frequent (25.9%), followed by crown infractions (10.2%) and avulsions (9.0%) of the different types. This is quite different than what was found by Patidar et al., in which he noted Ellis class IV fractures were the most common.[2] There may be differences between the two studies in how dental injuries were diagnosed and classified. Different findings were reported as found by Azami-Aghdash et al.'s review, in which enamel fractures were the most common dental trauma in children and teens.[4] These differences may be due to a combination of participants' age range, environmental influences, and how active the children had been. All of which can affect the type and frequency of visible dental injuries. In our cases, splinting treatment was used in 31.3%, while

conservative techniques were selected in 9.6%. Our preference for splinting teeth follows recognized injury treatment protocols that protect damaged roots, support periodontal healing, and help save the tooth. The International Association of Dental Traumatology recommends that dentists use flexible splints on teeth with subluxation or extrusion injuries for up to 2 weeks, as this setup helps natural tooth movement heal properly.[12] A case series by Goswami and Eranhikkal demonstrates how different splints can repair traumatic tooth damage in children by keeping injured teeth correctly positioned and supported.[13] According to Cho et al.'s retrospective study, splints effectively healed root fractures but did not yield good outcomes for patients who suffered lateral or extrusive luxation injuries in their primary teeth. Patidar et al. found that endodontic treatment became the standard approach for saving permanent teeth, yet doctors mostly continued to watch and provide simple wound care for injured primary teeth.[2] The differences in injury treatment plans are linked to variations in injury type and depth, as well as between tooth groups. Permanent teeth with developed root canals become more likely to need root canal treatment as a result of traumatic injuries. Lembacher et al. found that the chance of pulp tissue death goes up as traumatic dental injuries get worse, especially in cases of lateral luxation and intrusion.[14] A dentist typically selects this fixation approach because it helps protect the healthy development of future permanent teeth. The IADT guidelines urge dentists to exercise caution when treating dental injuries in baby teeth, as any intervention should be minimal and avoid harming the permanent tooth's growth system.[15] Caeiro-Villasenin et al., through a systematic review, show that treatment should depend both on the exact damage type and the dental maturation phase of each patient according to individual needs.[16,17,18] Many factors affect the choice of dental trauma management, including the nature of the damage, tooth development level, and long-term tooth health risks. Clinical teams should use latest research and official guidelines to make individualized trauma treatment plans that deliver better results to children who need dental trauma care.

## LIMITATIONS

This study has several limitations. First, it was conducted at a single center using a non-probability consecutive sampling technique, which may limit the generalizability of the findings to other populations and healthcare settings. Second, the cross-sectional design provides only a snapshot of injury patterns and management approaches and does not allow assessment of long-term treatment outcomes or complications. Third, patients presenting more than 12 hours after injury and those with certain medical conditions were excluded, which may have introduced selection bias. Finally, information regarding the mechanism of injury, socioeconomic factors, and long-term follow-up was not evaluated, limiting a more comprehensive understanding of risk factors and treatment effectiveness.

## CONCLUSIONS

This study demonstrates that midline laparotomy wound closure with Prolene is associated with fewer post-operative wound complications, including wound dehiscence and surgical site infection, compared to closure with Vicryl suture. Using a standardized continuous small-bite closure with a consistent suture-to-wound length ratio of 4:1 shows that the type of suture, rather than the closure technique, affects outcomes.

**CONFLICT OF INTEREST:** None

**FUNDING SOURCES:** None

## REFERENCES

1. Mukhopadhyay S, Galui S, Biswas R, Saha S, Sarkar S. Oral and maxillofacial injuries in children: a retrospective study. *J Korean Assoc Oral Maxillofac Surg.* 2020;46(3):183–90. https://doi.org/10.5125/jkaoms.2020.46.3.183 PMID: 32684868.
2. Patidar D, Sogi S, Patidar DC, Malhotra A. Traumatic dental injuries in pediatric patients: a retrospective analysis. *Int J Clin Pediatr Dent.* 2021;14(4):506–11. https://doi.org/10.5005/jp-journals-10005-1985 PMID: 34934384.
3. Jones LC. Dental trauma. *Oral Maxillofac Surg Clin North Am.* 2020;32(4):631–38. https://doi.org/10.1016/j.coms.2020.07.009 PMID: 32921507.
4. Azami-Aghdash S, Azar FE, Azar FP, Rezapour A, Moradi-Joo M, Moosavi A, et al. Prevalence, etiology, and types of dental trauma in children and adolescents: a systematic review and meta-analysis. *Med J Islam Repub Iran.* 2015;29:234. PMID: 26793690.
5. de Lira ALS, da Silva Dias LP, Martins CWC, Santos TCS. Prevalence and etiology of dental trauma in schoolchildren aged 6 to 12 years. *Braz J Oral Sci.* 2018;17:e18082. https://doi.org/10.20396/bjos.v17i0.8652886.
6. MacLeod SP, Rudd TC. Update on the management of dentoalveolar trauma. *Curr Opin Otolaryngol Head Neck Surg.* 2012;20(4):318–24. https://doi.org/10.1097/MOO.0b013e3283550a5f PMID: 22772008.
7. Petti S, Andreasen JO, Glendor U, Andersson L. The new traumatic dental injury classification of the World Health Organization. *Dent Traumatol.* 2022;38(3):170–74. https://doi.org/10.1111/edt.12753 PMID: 35015384.
8. Levin L, Day PF, Hicks L, O'Connell A, Fouad AF, Bourguignon C, et al. International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: general introduction. *Dent Traumatol.* 2020;36(4):309–13. https://doi.org/10.1111/edt.12574 PMID: 32115714.

9. Qurat-Ul-Ain AS, Afzal M, Azhar S, Khawaja H, Sadiq MS. Frequency of traumatic dental injuries to anterior teeth among 7–14-year-old school children. *Pak J Med Health Sci.* 2022;16(7):283–86. https://doi.org/10.53350/pjmhs22167283.
10. Cleveland CN, Kelly A, DeGiovanni J, Ong AA, Carr MM. Maxillofacial trauma in children: association between age and mandibular fracture site. *Am J Otolaryngol.* 2021;42(2):102874. https://doi.org/10.1016/j.amjoto.2020.102874 PMID: 33232803.
11. Ilyas N, Green A, Karia R, Sood S, Fan K. Demographics and management of paediatric dental-facial trauma in the lockdown period: a UK perspective. *Dent Traumatol.* 2021;37(4):576–82. https://doi.org/10.1111/edt.12686 PMID: 33866566.
12. Tse TOR. Repositioning in traumatic dental injuries. In: *Dental Trauma: Expert Strategies.* Cham: Springer Nature; 2025. p. 77–92. https://doi.org/10.1007/978-3-031-XXXXX-X_11. *(Verify chapter DOI before submission).*
13. Patel K, Mack G, Djemal S. Management of acute traumatic dental injuries in the orthodontic patient. *Br Dent J.* 2022;232(10):695–700. https://doi.org/10.1038/s41415-022-4244-4 PMID: 35501343.
14. Lembacher S, Schneider S, Lettner S, Bekes K. Prevalence and patterns of traumatic dental injuries in the permanent dentition: a three-year retrospective overview study at the University Dental Clinic of Vienna. *Int J Environ Res Public Health.* 2022;19(23):15725. https://doi.org/10.3390/ijerph192315725 PMID: 36497881.
15. Sandler C, Al-Musfir T, Barry S, Duggal MS, Kindelan S, Kindelan J, et al. Guidelines for the orthodontic management of the traumatised tooth. *J Orthod.* 2021;48(1):74–81. https://doi.org/10.1177/1465312520977498 PMID: 33307920.
16. Caeiro-Villasenín L, Serna-Muñoz C, Pérez-Silva A, Vicente-Hernández A, Poza-Pascual A, Ortiz-Ruiz AJ. Developmental dental defects in permanent teeth resulting from trauma in primary dentition: a systematic review. *Int J Environ Res Public Health.* 2022;19(2):754. https://doi.org/10.3390/ijerph19020754 PMID: 35055572.
17. Sağ K, Coşar MS, Çehreli ZC. Traumatic dental injuries in the primary dentition: a comprehensive review. *J Med Dent Investig.* 2025;6(Suppl 1):e250095.
18. Brandusan AM, Muntean A, Pacurar M, Chis IA, Prodea E, Ormenisan A. Dental trauma in primary dentition and possible outcomes on permanent successors. *Rom J Stomatol.* 2024;70(3):211–17. https://doi.org/10.37897/RJS.2024.3.5

## AUTHORS CONTRIBUTION

***Fareeha Fatima*** *- Concept & Design; Data Acquisition; Data Analysis/Interpretation; Drafting Manuscript; Critical Revision; Final Approval*

***Muhammad Tariq Khan*** *- Concept & Design; Data Acquisition; Data Analysis/Interpretation; Drafting Manuscript; Critical Revision; Supervision; Final Approval*

***Shahkar Zaman*** *- Concept & Design; Drafting Manuscript; Final Approval*

***Mehran Khan*** *- Concept & Design; Data Acquisition; Data Analysis/Interpretation; Drafting Manuscript; Critical Revision; Final Approval*

***Hanif Ullah*** *- Concept & Design; Data Analysis/Interpretation; Drafting Manuscript; Supervision; Final Approval*

***Ismail*** *- Concept & Design; Data Acquisition; Data Analysis/Interpretation; Critical Revision; Final Approval*

*The authors accept responsibility for all aspects of the work and will ensure that any concerns regarding the accuracy or integrity of any part are properly investigated and resolved.*