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Research Article

**A STUDY ON THE FACIAL TRAUMA AMONG SMALL AGE  
CHILDREN**<sup>1</sup>Dr Saulat Shabbir, <sup>1</sup>Dr Sundas Fatima, <sup>2</sup>Dr Nazakat<sup>1</sup>THQ Hospital Khanpur Rahim Yar Khan<sup>2</sup>Avicenna Hospital Lahore**Article Received:** July 2020**Accepted:** August 2020**Published:** September 2020**Abstract:**

**Objective:** The aim of this study is to determine the assessment, epidemiology and treatment of the FT (Facial Trauma) among small aged children with strong concentration on the particular challenges faced in these patients. We also discuss the most recent controversies in the administration of this issue.

**Recent Outcomes:** Most of the recent literature associated to the Facial Trauma among pediatrics emphasizes on the etiology, spread and control of such injury problems, with some research works focusing on the administration of this very issue. Generally, therapy of the maxillofacial fractures among pediatrics is very conservative as compared to male patients. When there is requirement of the internal fixation and open reduction, there is recommendation of either impermanent settlement of the absorbable plating or permanent titanium plating systems. We also noted the high utilization of the system of absorbable plating in the rigid fixation of the fractures among pediatrics. But these procedures are not the standard for the treatment.

**Conclusion:** FT among pediatrics are not much frequent but these issues can be the reason of morbidity for long or short period of time. There is a requirement of complete understanding of particular traits in increasing maxillofacial skeleton for the specialist handling these types of injuries.

**Keywords:** Maxillofacial, Skeleton, Fractures, Pediatrics, Therapy, Controversies, Impermanent, Absorbable, Plating, Epidemiology, Etiology.

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**INTRODUCTION:**

There are unique challenges in the therapy of the maxillofacial injuries among pediatric patients. There is strong need for surgeons to consider the distinct anatomy and the physiologic disparities in developing skeleton of the face while administering these injuries. There are some techniques for the treatment of the facial fractures among adults like permanent titanium plating which are not much beneficial in case of the pediatric patients due to the development of dental cavity as well as craniofacial development patterns. From last few years, we found a revolution in the surgical treatment for the craniofacial fractures but there is not absolute understanding of the impacts of rigid fixation of the development of the craniofacial regions. This research work aimed to discuss the intricacies linked with the facial fractures among children and review of the modern developments in the treatment for such facial traumas.

**EPIDEMIOLOGY:**

One of the reasons of high mortality among children is trauma. But facial trauma is not much frequent among pediatrics. Children are only accountable for lower than 13.0% maxillofacial traumas [1]. The occurrence of the facial traumas is very rare in the children having lower than six year of age but the prevalence rate increase with the increase of the age. The occurrence of the Facial Trauma is a little bit high among males due to heavy involvement in sports and other physical activities [2]. The most frequent reasons of the Facial Trauma are injuries related to sports, falls and accidents on roads.

**DEVELOPMENTAL ANATOMY:**

The patterns of the maxillofacial traumas among pediatrics are much different as present in adults. The main reasons for the differences are the development patterns. At the time of birth, 6:1 is the ratio of cranium to face. This ratio reduces to 2:1 at the age of five years, ultimately reducing to 2.48:1.0 among adults. Among youngsters, large size of cranium and forehead give protection to face and make their contribution in the decreased prevalence of the Facial Trauma but increase the prevalence of the cranial traumas. Mid-face traumas among pediatrics are not much common because of the buccal fat pad [3].

Additionally, to the disparities in the proportions of the craniofacial patterns, maxillofacial bones of pediatrics have more malleability as compared to the bones of adults. Therefore, the occurrence of the 'Greenstick' traumas is very common [4]. The 'white-eyed' orbital floor blowout trauma is related with the entrapment of the inferior rectus in the availability of the minimal signs of the floor trauma. Rigid fixation with the utilization of the titanium plates and traditional maxilla-mandibular fixation

with the utilization of the arch bars are some of the techniques [5].

**EVALUATION OF TRAUMA IN PEDIATRICS**

The assurance of the safe airway is the most important priority to handle the patient with trauma. Fast efforts of resuscitation then emphasis on upholding the hemodynamic stability with particular attention to wound's hemostasis due to the less volume of blood in the pediatric patient [6]. Zimmerman stated that very mild obstruction or swelling in the airway can fast lead to the disastrous incidents. A precise history as well as examination is very challenging in the pediatric patients present with trauma. The most valuable source can be the members of the family or bystanders [7,8]. There can be a limitation of the physical examination by the availability of the enhanced subcutaneous fat of face, the propensity for the displacement of minimal fracture and adverse compliance. Computed tomography (CT) is the best method to identify the maxillofacial trauma in pediatric patient.

**CHALLENGES IN FACIAL TRAUMA AMONG PEDIATRICS**

There is the requirement of very short duration of MMF in the patients with mandibular fractures, which has the ability to reduce the danger of dysfunction of temporomandibular joint. In opposition to it, the fracture reduction is very complicate in the patients with delayed arrival due to the early healing of the bone [9]. There is necessity of various techniques among pediatric patients as compared to the adult patients. Erich arch bars are the frequently utilized for MMF among adult patients, but other wiring approaches are much necessary among the children like Ivy loops or the circum-mandibular wires [10,11]. The impact of the rigid fixation as well as the permanent system of plating are not understandable on the skeleton having growth.

**PERMANENT VERSUS BIORESORBABLE PLATE FIXATION**

The modification of the fixation of the metallic plate dramatically altered the treatment algorithm for these traumas and better outcomes of surgery. The impacts of for long term of the rigid internal fixation are not clear in the growing skeleton of the face of pediatric patients because it can have impact on the growth. There are some reported limitations of the modernity and contain [12]; absorbable plates tend to be thick and present with the low profile as compared to the titanium micro-plates; there is not sufficient strength of the screws and plates for the areas which bear the load; heating is needed for the plates bending and there is requirement of pre-tapping for the placement of the screws. According to the reports, resorbable systems are very effectual [13].

Eppley stated no complications related to hardware in 42 fractures of faces among pediatrics treated with this method. Bell & Kindsfater also reported the favorable outcomes in 57 patients. Rigid fixation is the standard treatment in case of the displaced fractures. But to have escape from the probable complications linked with the plate migration as well as alterations in the skeletal development, there is recommendation of the removal of permanent plating after two to three months [14]. There are strong recommendations for the removal of the permanent plating systems or the placement of the resorbable plates among children having less than ten year of age.

#### MANDIBLE FRACTURES

Mandible Fractures are accounted for 32.0% to 44.88% of all the facial traumas among pediatrics. There is still use of the fixation of the rigid fracture, non-surgical techniques are very common as compared to the approaches in adult patients [15].

Condyle injury appears with a therapeutic dilemma, as this region is the center of development for mandible. The traditional management depends largely on the non-surgical intervention, with fixation of maxilla-mandibular utilized in the patients present with malocclusion. Regardless of the ability of condyle after injury to remodel, there has stated a very high prevalence of about 81.0% of not complete remodeling as present on radiologic examination [16]. There are still suggestions of the non-surgical treatment for these traumas by the specialists. ORIF (Open Reduction and Internal Fixation) is stated by the Deleyiannis in his research work for the patients having less than fourteen year of age with condylar traumas [17]. Figure-1 shows the image of computed tomography of a four-year girl with a severe fracture of parasymphyseal & mandibular angle handles with the circum-mandibular & screws for inter-maxillary fixation. There was no use of plating and the patient was present with excellent outcome.



Figure 1: Mandible Fractures

#### MID-FACE FRACTURES

Mandible and cranium normally protect the children from the fractures of mid-face. The high malleability is also one of the reasons for the protection of this fracture among children as compared to the adults. The accidents on the roads are the main reason behind the occurrence of these particular fractures [18]. There is a need of careful management for the prevention of the dental sequelae on permanent basis. Figure-2 shows the computed tomography image with findings during surgery in four-year-old child present with the fracture of palate.

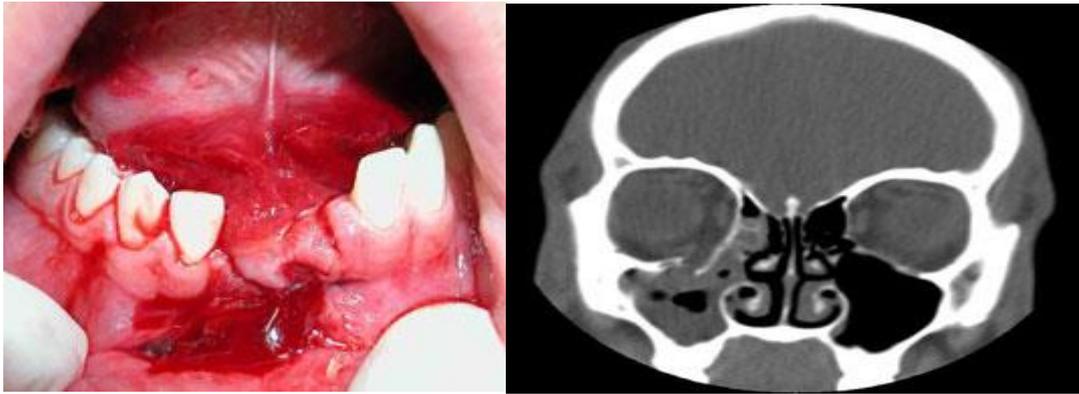


Figure 2: Mid Face Fractures

### NASAL FRACTURES

General anesthesia is necessary for the patients with nasal fracture. There is requirement of the close examination for the septal hematoma for the prevention of the devastating deformities of nose. This is important for the physician to protect the development centers of the nasal septum [19]. Sometimes, open reduction with the methods of standard rhinoplasty approaches are much necessary to re-establish the airflow of nose as well as nasal contour.

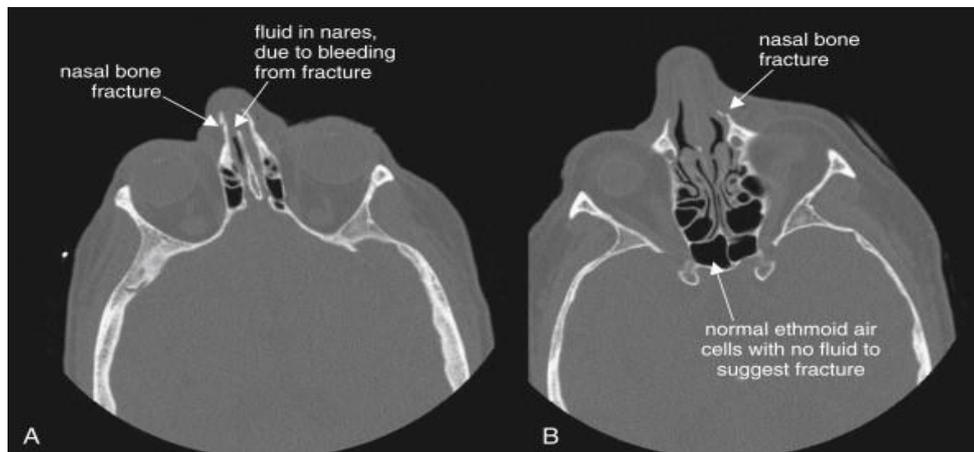


Figure 3: Nasal Fractures

### FRONTAL SINUS FRACTURES

These fractures among children are not much frequent but carry the two-time greater danger of the involvement of posterior table and leak of CSF (Cerebrospinal Fluid) in pediatrics as compared to adult patients [20,21]. Related intracranial traumas are very frequent in pediatric patients with the fractures of frontal sinus in comparison to the adult patients.

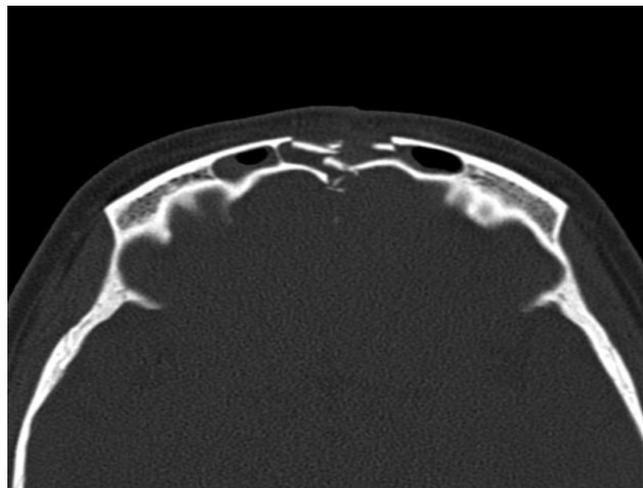


Figure 4: Frontal Sinus Fracture

### ORBITAL FRACTURES

There is a large variety of the medical appearance and fractures designs occur in case of orbital trauma among pediatrics. Blunt trauma can be the cause of the combination of fractures of orbital floor, orbital floor or medial orbital wall [22]. If not treated, these fractures can lead to the diplopia and exophthalmoses in patients of all ages. There are recommendations for the early repair, particularly within two days for better outcomes when there is presence of the muscular entrapment [23,24]. These proposes immediate repair of the fractures of medial orbital wall with an implant [25]. Figure-3 shows a boy of fifteen year of age with fracture of medial orbital wall & entrapped orbital tissue. The child can have complained of vomiting or nausea as a sign of the entrapment of the extraocular muscle.

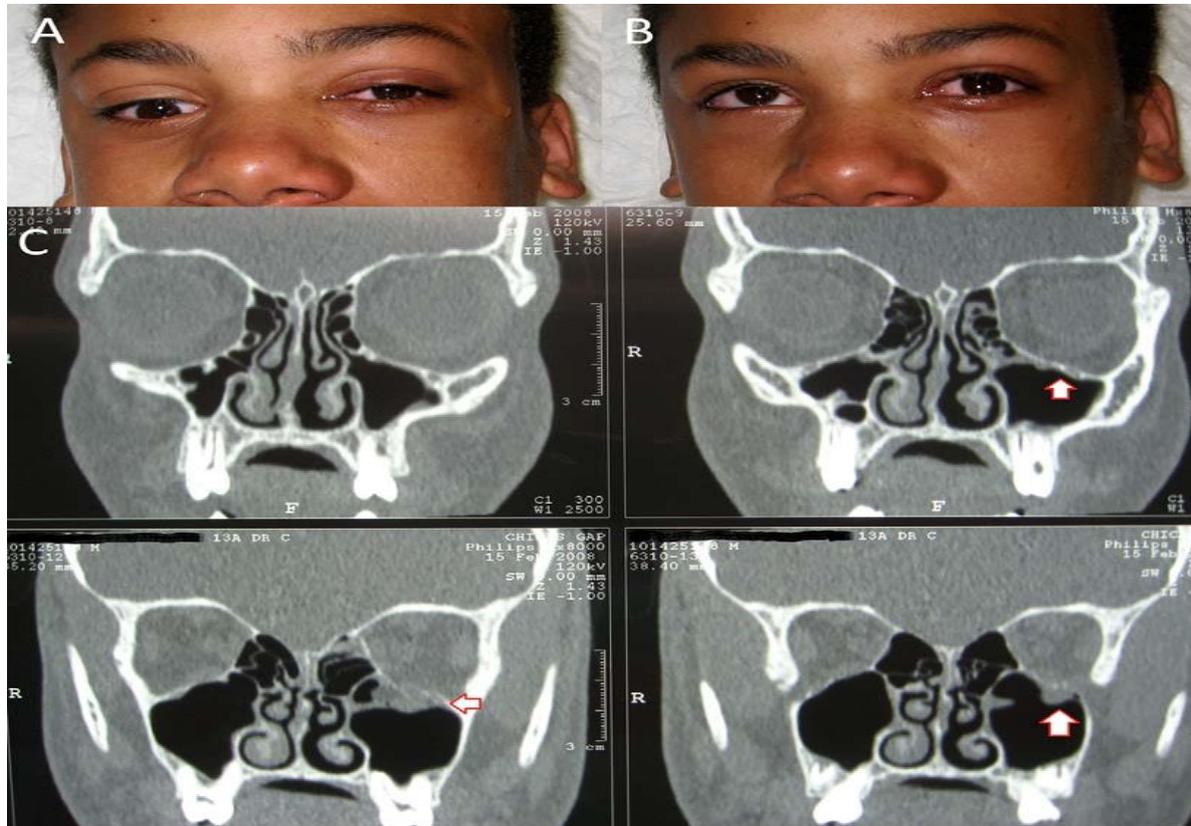


Figure 4: Orbital Fractures

### CONCLUSION:

Facial trauma among pediatrics are not much frequent. There should be a special consideration towards craniofacial as well as related dental development for the identification and treatment of such issues. There is recommendation for the conservative techniques for these injuries. There us suggestion for the impermanent settlement of the permanent plates or the other system of biodegradable when there is need of internal.

### REFERENCES:

1. Cisler, J. M., Privratsky, A., Smitherman, S., Herringa, R. J., & Kilts, C. D. (2018). Large-scale brain organization during facial emotion processing as a function of early life trauma among adolescent girls. *NeuroImage: Clinical*, 17, 778-785.
2. Alhaddad, A. Y., Cabibihan, J. J., & Bonarini, A. (2019). Head impact severity measures for small social robots thrown during meltdown in autism. *International Journal of Social Robotics*, 11(2), 255-270.
3. Bilder, L., Margvelashvili, V., Sgan-Cohen, H., Kalandadze, M., Levin, L., Ivanishvili, R., & Machtei, E. E. (2016). Traumatic dental injuries among 12-and 15-year-old adolescents in Georgia: results of the pathfinder study. *Dental traumatology*, 32(3), 169-173.
4. Lexomboon, D., Carlson, C., Andersson, R., von Bultzingslowen, I., & Mensah, T. (2016). Incidence and causes of dental trauma in children living in the county of Värmland, Sweden. *Dental traumatology*, 32(1), 58-64.
5. Bobian, M., El-Kashlan, N., Hanba, C. J., Svider, P. F., Folbe, A. J., Eloy, J. A., ... & Carron, M. (2017). Traumatic facial injuries

- among elderly nursing home residents: never event or frequent occurrence? *JAMA Otolaryngology–Head & Neck Surgery*, 143(6), 569-573.
6. Chauhan, S. P., Rice, M. M., Grobman, W. A., Bailit, J., Reddy, U. M., Wapner, R. J., ... & Prasad, M. (2017). Neonatal morbidity of small-and large-for-gestational-age neonates born at term in uncomplicated pregnancies. *Obstetrics and gynecology*, 130(3), 511.
  7. Barbosa, K. G. N., de Macedo Bernardino, Í., d'Avila, S., e Ferreira, E. F., & Ferreira, R. C. (2017). Systematic review and meta-analysis to determine the proportion of maxillofacial trauma resulting from different etiologies among children and adolescents. *Oral and maxillofacial surgery*, 21(2), 131-145.
  8. Iizuka T, Thoren H, Annino DJ, et al. Midfacial fractures in pediatric patients. Frequency, characteristics, and causes. *Arch Otolaryngol Head Neck Surg* 1995; 121:1366–1371.
  9. Sarnat BG, Wexler MR. Growth of the face and jaws after resection of the septal cartilage in the rabbit. *Am J Anat* 1966; 118:755–768.
  10. Sarnat BG. The face and jaws after surgical experimentation with the septovomer region in growing and adult rabbits. *Acta Otolaryngol Suppl* 1970; 268:1–30.
  11. Verwoerd CD, Verwoerd-Verhoef HL. Rhinosurgery in children: basic concepts. *Facial Plast Surg* 2007; 23:219–230. Nasal anatomy in the developing child is discussed in this article and tips are provided to avoid injury to the growth centers of the nose during rhinoplasty.
  12. Dennis SC, den Herder C, Shandilya M, Nolst Trenite´ GJ. Open rhinoplasty in children. *Facial Plast Surg* 2007; 23:259–266. These authors discuss indications and techniques for open rhinoplasty in children.
  13. Wright DL, Hoffman HT, Hoyt DB. Frontal sinus fractures in the pediatric population. *Laryngoscope* 1992; 102:1216–1219.
  14. Whatley WS, Allison DA, Chandra RK, et al. Frontal sinus fractures in children. *Laryngoscope* 2005; 115:1741–1745.
  15. Jordan DR, Allen LH, White J, et al. Intervention within days for some orbital floor fractures: the white-eyed blowout. *Ophthalmic Plast Reconstr Surg* 1998; 14:379–390.
  16. Jung, T. K., De Silva, H. L., Konthasingha, P. P., & Tong, D. C. (2015). Trends in paediatric maxillofacial trauma presenting to Dunedin Hospital, 2006 to 2012. *New Zealand dental journal*, 111(2).
  17. Bede, S. Y. H., Ismael, W. K., & Al-Assaf, D. (2016). Patterns of pediatric maxillofacial injuries. *Journal of Craniofacial Surgery*, 27(3), e271-e275.
  18. Sirichai, P., & Anderson, P. J. (2015). Orbital fractures in children: 10 years' experience from a tertiary centre. *British journal of oral and maxillofacial surgery*, 53(10), 938-942.
  19. Agacayak, K. S., Gulsun, B., Koparal, M., Atalay, Y., Aksoy, O., & Adiguzel, O. (2015). Alterations in maxillary sinus volume among oral and nasal breathers. *Medical science monitor: international medical journal of experimental and clinical research*, 21, 18.
  20. Eslamipour, F., Iranmanesh, P., & Borzabadi-Farahani, A. (2016). Cross-sectional study of dental trauma and associated factors among 9- to 14-year-old schoolchildren in Isfahan, Iran. *Oral Health Prev Dent*, 14(5), 451-457.
  21. Haring, R. S., Sheffield, I. D., & Frattaroli, S. (2017). Detergent pod-related eye injuries among preschool-aged children. *JAMA ophthalmology*, 135(3), 283-284.
  22. Abdul Razak, N., Nordin, R., Abd Rahman, N., & Ramli, R. (2017). A retrospective analysis of the relationship between facial injury and mild traumatic brain injury. *Dental traumatology*, 33(5), 400-405.
  23. Tamada, I., Mori, T., Inoue, N., Shido, H., Aoki, M., Nakamura, Y., & Kamogawa, R. (2017). An algorithmic approach using ultrasonography in the diagnosis of pediatric nasal bone fracture. *Journal of Craniofacial Surgery*, 28(1), 84-87.
  24. Hales, C. M., Fryar, C. D., Carroll, M. D., Freedman, D. S., & Ogden, C. L. (2018). Trends in obesity and severe obesity prevalence in US youth and adults by sex and age, 2007-2008 to 2015-2016. *Jama*, 319(16), 1723-1725.
  25. de Alencar Gondim, D. G., Bessa-Nogueira, R. V., do Egito Vasconcelos, B. C., do Amaral, M. F., Melo, A. R., Pita-Neto, I. C., & Montagner, A. M. (2015). Pediatric facial fractures: case series and critical review. *International Archives of Medicine*, 8.