International Journal of Research in Health and Allied Sciences
Journal home page: www.ijrhas.com
Official Publication of "Society for Scientific Research and Studies" [Regd.]
ISSN: 2455-7803

Case Report

Conservative Approach to Pediatric Mandibular Fracture: A Report of Two Cases

Parnika Kuthiala[1], Sunaina Singla[2], Hirdepal Singh Brar[3], Raman Grewal[4]

[1]Assistant Professor, Department of Oral and Maxillofacial Surgery, RR Dental College and Hospital, Udaipur, Rajasthan;
[2]Senior Private Practioner, Oral and Maxillofacial Surgeon, New Delhi;
[3]Consultant, Oral and Maxillofacial Surgeon, Faridkot, Punjab;
[4]Assistant Professor, Oral and Maxillofacial Surgery, J.C.D Dental College, Sirsa, Haryana

ABSTRACT
Mandibular fractures are relatively less frequent in children due to the child's protected anatomical features as compared to adults. Management of pediatric mandibular fractures differs from that of adults, though the pattern of fractures remains the same. This happens due to a number of factors like anatomical complexity, mixed dentition stage, developing mandible, last but not the least child' s co-operation to accept the treatment. Therefore, treatment principles of management of pediatric mandibular fractures differ from that of adults due to concerns regarding mandibular growth and development of dentition.
Key words: Pediatric mandibular trauma, Mixed dentition, Conservative approach.

Received: 22 July, 2019 Revised: 15 August, 2019 Accepted: 18 August, 2019

Corresponding Author: Dr. Parnika Kuthiala, Assistant Professor, Department of Oral and Maxillofacial Surgery, RR Dental College and Hospital, Udaipur, Rajasthan, India

This article may be cited as: Kuthiala P, Singla S, Brar HS, Grewal R. Conservative Approach to Pediatric Mandibular Fracture: A Report of Two Cases. Int J Res Health Allied Sci 2019;5(5):34-39.

INTRODUCTION

Maxillofacial fractures are less common in children. The incidence ranges from approximately 1% in children under age of 5 years to 8% in children younger than 12 years of age[1]. Mandibular fractures are, after those of nasal bones, the most common fractures of the facial skeleton in children[2]. Conservative approach in treatment of maxillofacial trauma in children was common for many reasons, the presence of tooth buds and elasticity of pediatric bone were factors for splinting or MMF as standard treatment for mandible fracture in children during deciduous dentition. Generally due to mixed dentition stage, open reduction and internal fixation is avoided in pediatric mandibular trauma. Wiring, acrylic splints, MMF are generally preferred due to lack of co-operation and complexity of child's developing mandible. Therefore, here we present two cases of conservative approach to manage pediatric trauma.

CASE REPORT 1:

A 5 year old male child patient, reported to the Department of Oral & Maxillofacial Surgery with a history of fall from height at his own place while playing. There was no history of vomiting, seizures, loss of consiousness, ear, nose, throat bleed. There was no relevant past medical and dental history. Patient was conscious, cooperative and well oriented to time, place and person. Upon extraoral examination laceration was present near angle of the mouth on right side and on right side of forehead. Upon intraoral examination step defect was present on left parasymphyseal region. There was derrangement of occlusion with limited mouth opening (FIG 1). On radiological examination, CT Head was done to rule out any component of head injury and was normal. OPG revealed mandibular symphyseal fracture (Fig 2). Routine blood investigations were carried out and were normal.

Treatment Plan: Primary treatment was instituted. Primary closure of the lacerated wounds was done using 3-0 ethilon sutures. Preoperatively maxillary and mandibular

impressions were made in alginate (Fig 3). Impressions poured in dental stone and cast made (Fig 4). Models articulated and interocclusal splint constructed after reduction of the fracture on models. Intraoperatively under local anaesthesia, the dislocated segments were reduced by bilateral pressure with the guidance of surgical splint. A small stab insision was placed at the inferior border of the mandible. A William velsey fry awl was introduced the stab incion. The bone awl was guided along the body of the mandible and taken out lingually. Next the wire was tied in and the awl was gently guided along the lower border of the mandible and passed into the buccal sulcus. The acrylic cap splint was stabilized by winding the wire in the clockwise direction. Same procedure was followed on the left side (Fig 5). Postoperatively OPG radiograph was taken to check if the wires were properly secured to bone (FIG 6). Postoperative antibiotic treatment was started for 1 week. Soft diet, avoidance of physical activities and antibacterial mouth rinse was prescribed. Postoperative monitoring was performed on weekly basis. The interdental wiring and acrylic splint were removed after 3 weeks.

FIG1: STEP DEFECT AND DERANGED OCCLUSION

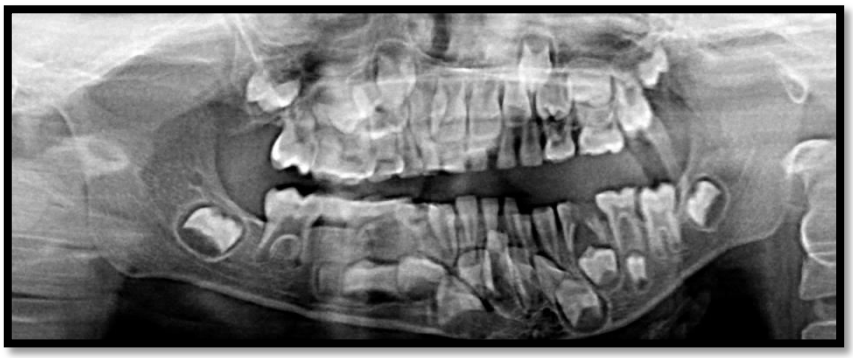

FIG 2: PREOPERATIVE OPG SHOWING MANDIBULAR SYMPHYSEAL FRACTURE

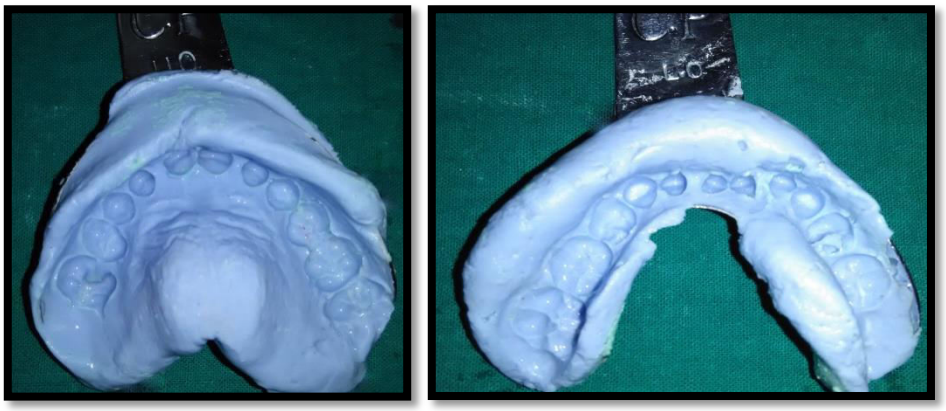

FIG 3: ALGINATE IMPRESSIONS POURED

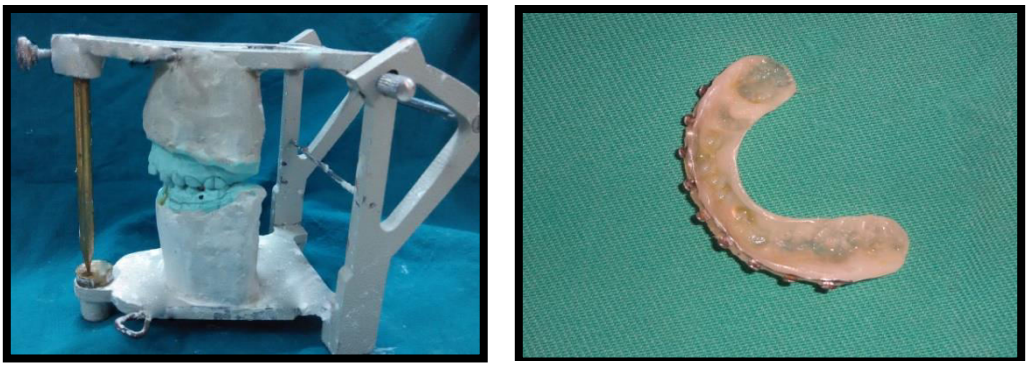

FIG 4: ACRYLIC CAP SPLINT MADE

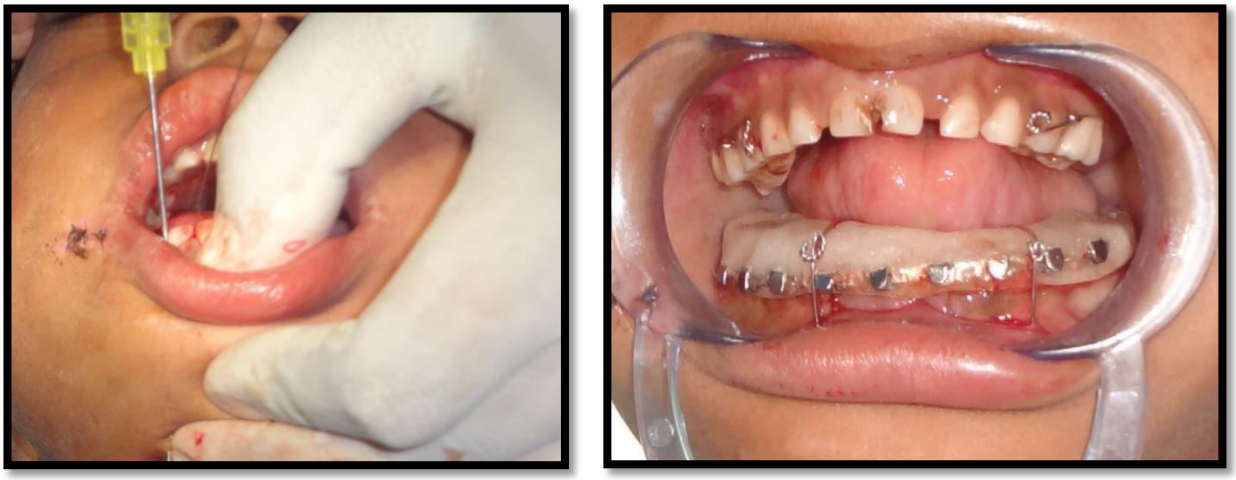

FIG 5: CIRCUMANDIBULAR WIRING

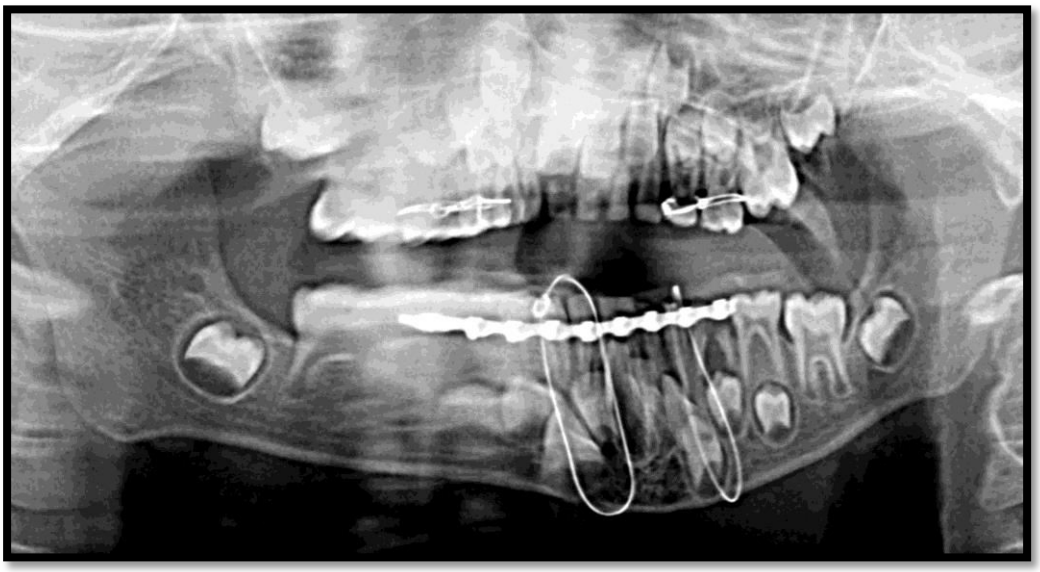

FIG 6: POSTOPERATIVE OPG

CASE REPORT 2:

A 5 year old male child patient, reported to the department of Oral & Maxillofacial Surgery with a history of fall from a 10-feet high guava tree (FIG 7). There was no history of vomiting, seizures, loss of consciousness, ear, nose, throat bleed. There was no past medical and dental history. Patient was conscious, uncooperative and well oriented to time, place and person. Upon extraoral examination laceration was present at the chin. Upon intraoral examination step defect was present on midsymphyseal region. There was derrangement of occlusion.

Radiological examination: CT Face revealed mandibular symphyseal fracture (Fig 8,9). Routine blood investigations were carried out and were normal

Treatment plan: Primary closure of the lacerated wound was done using 3-0 ethilon sutures. As the child was uncooperative and refused to get a cap splint, we modified the treatment plan by giving closed reduction to the patient with the help of standard Erich's arch bar which was trimmed according to the patient's dentition size. Therefore, preoperatively standard Erich's arch bar was trimmed according to the mixed dentition. Under local anaesthesia Erich's arch bar was adapted in maxillary and mandibular arches and was fixed using a more thinner wire that is 30 gauge than usual 26 gauge wire as the child's co-operation was the major concern and maxillomandibular fixation was done for 1 week. Postoperative antibiotic treatment was started for 1 week (FIG 10). Soft diet, avoidance of physical activities and antibacterial mouth rinse was prescribed. Postoperative monitoring was performed on weekly basis.

FIG 7: PREOPERATIVE CLINICAL PHOTOGRAPH

FIG 8: PREOPERATIVE OPG

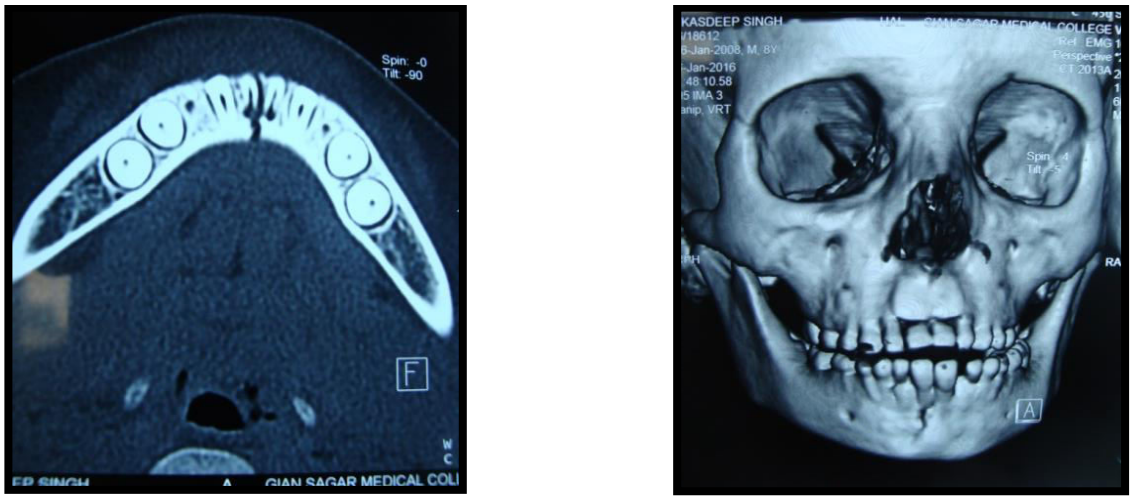

FIG 9: CT SHOWING MANDIBULAR SYMPHYSEAL FRACTURE

FIG 10: ERICH'S ARCH BAR SECURED USING LIGHTER GAUGE WIRE AND MMF DONE FOR 1 WEEK

DISCUSSION

Pediatric maxillofacial fractures are not common and demonstrate different clinical features when compared with adults. They also need different treatment due to difference in their facial bones and skulls. Most of the pediatric fractures are firmly united in 2 to 3 weeks, because of the increased metabolic rate and increased osteogenic potential of periosteum in children[3].

Clinical signs and symptoms of pediatric fracture are the same as in adults. Thorough clinical examination, however, may be impossible in the uncooperative young trauma patient. Panoramic radiographs are the first step in all for definitive diagnosis. Computed tomography, is the current modality of choice for the diagnosis of maxillofacial trauma. Computed tomography scans have greatly increased the diagnostic accuracy and have become the gold standard of care for imaging pediatric trauma.

Treatment of mandibular fractures in children depends on the fracture site and the stage of skeletal and dental development. Studies have stated that fractures of the mandible are treated by open or closed reduction and immobilization by splints and arch bars for 2 to 3 weeks[4].

Mandibular fractures without displacement and malocclusion are managed by observation, a soft liquid diet, and analgesics. Displaced mandibular fractures are of prime concern as they interfere with normal day to day life activities of the patient and need to be reduced and immobilized. The tooth buds within the mandible do not allow internal fixation with plates and screws[5] as it can damage the tooth buds, therefore this can be achieved with a mandibular splint fixed to the teeth by circum-mandibular wiring, gunning splint or a splint with MMF[6].

Displaced symphysis fractures can be treated by open reduction and rigid fixation through an intraoral incision after age six, as permanent teeth have mostly erupted. Open reduction internal fixation (ORIF) in parasymphysis fractures is only feasible, when the buds of the canines have moved up from their inferior position at the mandibular border after age nine. Similarly, in body fractures, the inferior mandibular border can be plated, when the buds of the permanent premolar and molar have migrated superiorly.[6]

Common recommended methods of management of mandibular fractures are as follows[7]:

0 to 2 years: Treated as with Maclennan type of splint, acrylic splint.

2 to 4 years: There are deciduous teeth so eyelet wiring or cap splint can be used.

5 to 8 years: After some of the permanent teeth have erupted so MacLennan, Acrylic cap splints can be used.

9 to 11 years: There is permanent dentition so Cap Splints, arch bars, plating or trans-osseous wiring at lower border can be used.

In the above cases, we preferred acrylic type of cap splint and Erich's arch bar respectively. Cap splint has various advantages like it covers both lingual and buccal cortical plates and hold the mandibular cortices securely without much discomfort to the patient. Other advantages include:

- Occlusion is open.
- Daily function is not impaired.
- The functional stresses will increase remodeling.
- There is decrease in the catabolic phase.

Whereas in second case generally Erich's arch bar is avoided in pediatric patient due to mixed dentition. As patient's co-operation was prime concern, Erich's arch bar was trimmed, secured and MMF was done for 1 week and it was well accepted by an unco-operative child under local anaesthesia.

PREVENTION

The importance of preventive measures should be emphasized to the parents and society. Parents and concerned supervisory people, i.e. coaches, administrators, teachers and parents should be educated. Children should be encouraged to develop good habits, because of

incidence and severity of sports-related injuries and injuries due to road traffic accident[8].
Injuries in the children can be prevented by seat restraints, conventional seat belts, protective helmets, mouth guards[9] etc and by proper guidance to the parents.

CONCLUSION

While our follow-up period was too short to determine the long-term effects of fracture treatment with Acrylic cap splint and Erich's Arch Bar, is favorable. The splint and MMF showed sufficient rigidity and stability to enable initial bone healing of the mandible. Our observation showed that Tissue intolerance, growth restrictions, and occlusal abnormalities were not seen in our above cases and occlusal relationship could be restored in both the cases. Benefits for children are evident since patient comfort is higher.

REFERENCES

1. Das UM, Vishwanath D, Subramanian V. Management of dentoalveolar injuries in children: a case report. . JISPPD. 2007 Dec;25(4):183–186. [PubMed]
2. Maniglia AJ, Kline SN. Maxillofacial trauma in the pediatric age group. Otolaryngol, Clinical North Amer. 1983;16(3):717–730. [PubMed]
3. Das UM, Nagarathna C. Management of facial trauma in children: a case report. JISPPD. 2006 Sep;24(3):161–163. [PubMed]
4. Frazer JE. The skull: General account. In: Breathnaach AS, editor. Anatomy of the human skeleton. 6th ed. 2. London: J and A Churchill Ltd; 1965. pp. 161–181.
5. McGraw BL, Cole RR. Pediatric maxillofacial trauma. Age-related variations in injury. Arch Otolaryngol Head Neck Surg. 1990;116(1):41–45. [PubMed]
6. Meier K, Barsekow F, Hausamen JE. Problems associated with fractures of the visceral cranium involving multiple injuries in children. Dtsch Zahnarztl Z. 1990;45(12):806–807. [PubMed]
7. Posnick JC, Wells M, Pron GE. Pediatric facial fractures: evolving patterns of treatment. J Oral Maxillofac Surg. 1993;51(8):836–844. [PubMed]
8. Yarington CT Jr. Maxillofacial trauma in children. Otolaryn-gol Clin North Am. 1977;10(1):25–32.[PubMed]
9. Lund K. Mandibular growth and remodelling processes after condylar fracture. A longitudinal Roentgencephalometric study. Acta Odontol Scand Suppl. 1974;32(64):3–117. [PubMed]
10. Adekeye EO. Pediatric fractures of the facial skeleton: a survey of 85 cases from Kaduna, Nigeria. J Oral Surg. 1980;38(5):355–358. [PubMed]
11. Bataineh AB. Etiology and incidence of maxillofacial fractures in the north of Jordan. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 1998;86(1):31–35. [PubMed]
12. Gussack GS, Luterman A, Powell RW, Rodgers K, Ramenofsky ML. Pediatric maxillofacial trauma: unique features in diagnosis and treatment. Laryngoscope. 1987;97(8):925–930. [PubMed]
13. Hartel J. Facial bone fractures and their accompanying injuries during growth. Stomatol DDR.1985;35(5):247–253. [PubMed]