

Conservative management of left mandibular parasymphysis and body fractures in a 10-year-old child using an open cap splint and circummandibular wiring: A case report

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Abstract

Pediatric mandibular fractures require treatment that restores occlusion and mandibular continuity while minimizing interference with developing dentition and facial growth. Conservative stabilization is particularly useful when adequate fracture reduction can be achieved without open reduction and internal fixation. We report the management of a 10-year-old female child who presented one day after a fall from a terrace with a left mandibular parasymphysis and body fracture and deranged occlusion. Panoramic radiography and three-dimensional cone-beam computed tomography demonstrated the mandibular fracture pattern. After clinical and radiographic assessment, fracture reduction and occlusal correction were achieved under deep sedation, followed by stabilization using an open cap splint retained with circummandibular wiring. Postoperative medications and routine instructions were provided, and the patient was followed for one month. This case demonstrates the practical use of an open cap splint with circummandibular wiring as a conservative treatment option for mandibular fractures in a child with mixed dentition.

Keywords: Mandibular fractures, parasymphysis fracture, body of mandible, deranged occlusion, trauma

Introduction

Mandibular fractures in children differ from those in adults because treatment must account for active craniofacial growth, developing permanent teeth, mixed dentition, and the potential for long-term effects on occlusion and mandibular development [1]. Conservative approaches are therefore frequently considered when satisfactory reduction and stabilization can be obtained without extensive surgical manipulation.

Open cap splints retained by circummandibular wiring have been described as a useful method for stabilizing pediatric mandibular fractures while limiting the potential risks associated with rigid internal fixation [2]. Previous reports and case series have demonstrated favorable outcomes using acrylic splints and circummandibular wiring in pediatric parasymphysis and symphysis fractures. The present case describes the conservative management of a left parasymphysis and body fracture in a 10-year-old child using an open cap splint and circummandibular wiring [3].

Case Presentation

Patient information

A 10-year-old female child reported to the Department of Paediatric and Preventive Dentistry one day after sustaining a fall from a terrace. The chief clinical concern was traumatic mandibular injury associated with derangement of occlusion. The available case record did not document any relevant systemic medical history or previous intervention related to the fracture.

Clinical findings

Clinical examination revealed deranged occlusion. The preoperative intraoral photographs demonstrated the

mandibular dentition and occlusal discrepancy. Extraoral and intraoral photographic documentation was obtained before treatment Fig. 1.

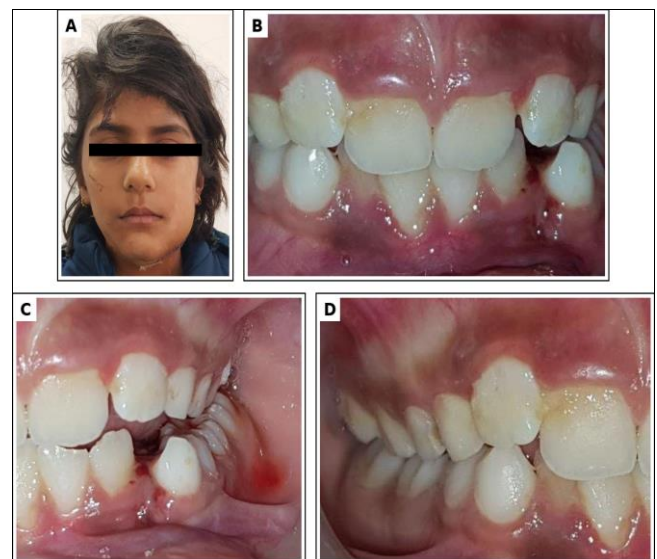


Fig 1: Preoperative clinical photographs. A Extraoral view; B frontal intraoral view; C left lateral intraoral view; D right lateral intraoral view.

Diagnostic assessment

Panoramic radiography and three-dimensional CBCT were used for diagnostic assessment. The imaging findings were consistent with a left-sided mandibular fracture involving the parasymphysis and body Fig. 2. The radiographic assessment was used to determine the fracture pattern and guide conservative treatment planning.

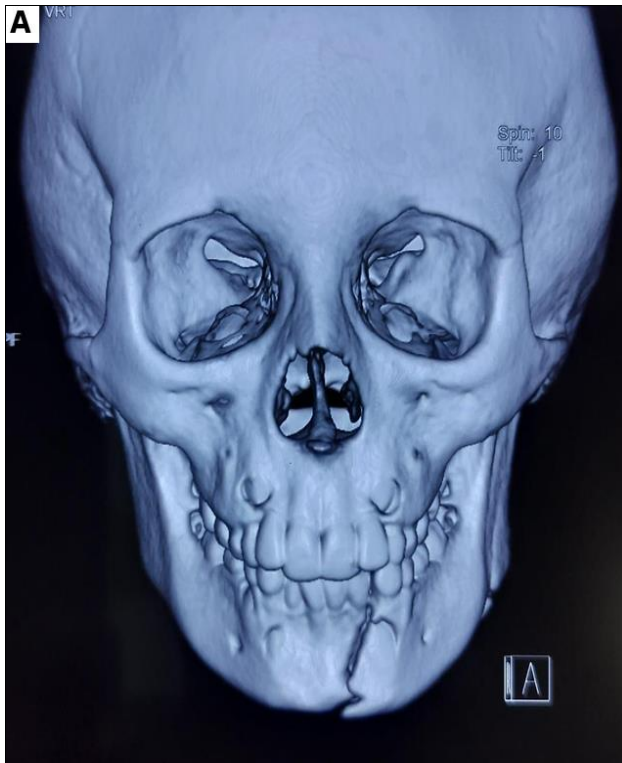


Fig 2: Preoperative three-dimensional CBCT reconstruction demonstrating the left mandibular parasymphysis and body fracture.

Therapeutic intervention

Following diagnostic evaluation, conservative fracture management was selected. Maxillary and mandibular casts were prepared from dental impressions, and the fracture relationship was reproduced on the working cast. An open cap splint was planned according to the child's dentition and the established occlusal relationship Fig. 3.

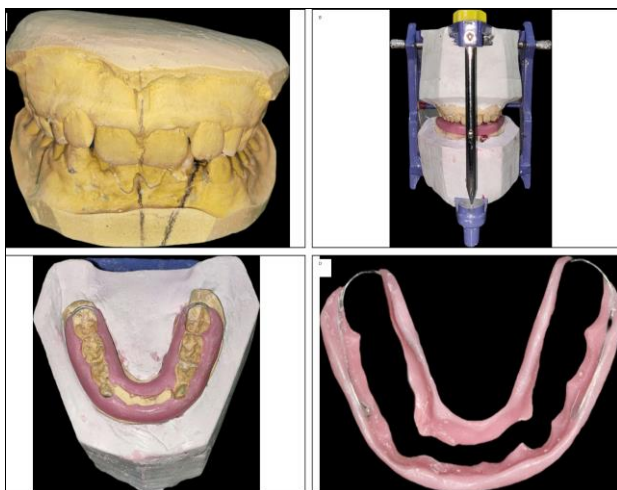


Fig 3: Treatment planning and open cap splint fabrication. A Mandibular cast demonstrating the fracture relationship; B articulator-mounted casts; C open cap splint adapted on the mandibular cast; D completed open cap splint.

The treatment was performed under deep sedation. The mandibular fracture segments were reduced and the occlusion was re-established. The open cap splint was adapted intraorally and secured with circummandibular wiring to stabilize the reduced fracture segments and maintain the corrected occlusal relationship Fig. 4.



Fig 4: Clinical stabilization. A Intraoral placement and stabilization of the open cap splint with circummandibular wiring; B postoperative extraoral view with gauze/chin dressing.

Postoperative medications were prescribed, and postoperative instructions were provided, including maintenance of oral hygiene, dietary modification, protection of the splint, and avoidance of activities that could compromise fracture healing. The specific medication names and dosages should be added from the clinical record before journal submission.

Follow-up and outcomes

The patient was followed for one month after treatment. Clinical follow-up was planned to assess maintenance of occlusion, stability of the fracture segments, soft-tissue healing, splint tolerance, and any treatment-related complications. The supplied case information confirms the one-month follow-up but does not provide the objective clinical or radiographic findings recorded at that visit. These findings should be inserted from the original follow-up record before submission.



Fig 5: Fifteen-day postoperative panoramic radiograph demonstrating the mandibular fracture region following conservative stabilization.

Discussion

Management of mandibular fractures in children requires consideration of growth, developing permanent tooth buds, mixed dentition, and the child's ability to tolerate immobilization [4]. Unlike adult fracture management, treatment should minimize unnecessary disruption of the developing facial skeleton while restoring occlusion and providing sufficient stabilization for healing.

Open cap splints retained with circummandibular wiring represent a conservative approach that can provide fracture stabilization without the placement of plates and screws adjacent to developing tooth buds. Kale et al. reported the use of open cap splints with circummandibular wiring for pediatric parasymphysis/symphysis fractures and described

the technique as a definitive treatment modality in selected children [5]. Similar conservative management using acrylic splints and circummandibular wiring has also been described in individual pediatric mandibular fracture cases [6].

The present case involved a left parasymphysis and body fracture in a 10-year-old child with deranged occlusion. The use of an open cap splint allowed stabilization of the mandibular dentition while avoiding open reduction and internal fixation [7]. The availability of dental casts before fabrication also permitted the splint to be constructed according to the child's individual occlusal anatomy. The treatment was completed under deep sedation, which facilitated fracture reduction and intraoral stabilization while avoiding the need for more invasive fixation [8].

An important consideration in this case is the mixed-dentition stage. Conventional fixation methods may be complicated by the presence of erupting permanent teeth and limited areas for secure fixation [9]. Circummandibular wiring provides an alternative means of retaining an acrylic splint when conventional dental fixation is unsuitable. The approach is therefore particularly relevant to pediatric dentistry and multidisciplinary management of pediatric mandibular trauma [10].

Clinical significance

- Pediatric mandibular fractures should be managed with attention to facial growth and developing dentition.
- Open cap splints can provide conservative stabilization of selected mandibular fractures in children.
- Circummandibular wiring provides secure retention of an acrylic splint without plate-and-screw fixation.
- Restoration and maintenance of occlusion are central objectives of pediatric mandibular fracture treatment.
- Accurate longitudinal clinical and radiographic follow-up is important to document fracture healing and detect late complications.

Conclusion

An open cap splint retained with circummandibular wiring provides a conservative and minimally invasive option for selected mandibular fractures in children. In this 10-year-old female child with a left parasymphysis and body fracture and deranged occlusion, the fracture was managed under deep sedation using an open cap splint and circummandibular wiring. Complete documentation of the one-month clinical and radiographic outcome should be incorporated before final journal submission.

Informed consent

Written informed consent for treatment and publication of the clinical photographs was obtained from the parent/legal guardian.

Declarations

Consent for publication: Written informed consent for publication of the clinical photographs was obtained from the parent/legal guardian.

Conflict of interest: None declared.

Funding: None declared.

References

1. Shah S, Katira P, Rao D, Panwar S. Management of mandibular fracture in a young child with conservative

approach: A case report. *Int J Oral Health Med Res*,2020;6(6):20-23.

2. Cole P, Kaufman Y, Hollier LH Jr. Managing the pediatric facial fracture. *Cranio-maxillofac Trauma Reconstr*,2009;2(2):77-83.
3. Kaban LB. Diagnosis and treatment of fractures of the facial bones in children. *J Oral Maxillofac Surg*,1993;51(7):722-729.
4. Haug RH, Foss J. Maxillofacial injuries in the pediatric patient. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*,2000;90(2):126-134.
5. Kale TP, Urologin SB, Kapoor A, Lingaraj JB, Kotrashetti SM. Open cap splint with circummandibular wiring for management of pediatric mandibular parasymphysis/symphysis fracture as a definitive treatment modality: A case series. *Dent Traumatol*,2013;29(5):410-415. doi:10.1111/j.1600-9657.2011.01082.x.
6. Posnick JC, Wells M, Pron GE. Pediatric facial fractures: Evolving patterns of treatment. *J Oral Maxillofac Surg*,1993;51(8):836-844.
7. Vellore KP, Gadipelly S, Dutta B, Reddy VB, Ram S, Parsa A. Circummandibular wiring of symphysis fracture in a five-year-old child. *Case Rep Dent*,2013;2013:930789. doi:10.1155/2013/930789.
8. Zimmermann CE, Troulis MJ, Kaban LB. Pediatric facial fractures: Recent advances in prevention, diagnosis and management. *Int J Oral Maxillofac Surg*,2005;34(8):823-833.
9. Garg I, Samal S, Kumar A. Management of paediatric mandibular parasymphysis fracture with open cap splint: A definitive conservative treatment modality. *Int J Health Sci Res*,2020;10(1):198-202.
10. Management of fracture mandible by open occlusal acrylic splint in pediatric patients: A case series. *J Clin Diagn Res*,2022;16(1):ZE01-ZE05. doi:10.7860/JCDR/2022/50706.15972.