Case Report

An indigenous method for closed reduction of pediatric mandibular parasymphysis fracture

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ABSTRACT

Mandibular fractures in children are very rare as compared to adults due to protected anatomic features of child and less exposure to road traffic accidents. Management becomes complicated due to inherent dynamic nature, instability of mixed dentition and fear of surgery. Conservative management can be done with the help of acrylic cap splints along with circum-mandibular wiring, intermaxillary fixation with eyelet wires, arch wires or open reduction and internal fixation with bio-resorbable plates. Different methods have various pros and cons. The choice of anesthesia is also very crucial sometimes. This case report describes a new method of closed reduction with 18 gauge needle simulated as an arch bar performed under local anaesthesia.

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Key words: Closed reduction, mandibular fracture, maxillofacial injury, pediatric patient, 18 gauge hollow needle

Introduction

Fractures of maxillofacial skeleton in pediatric trauma patients are not very frequent as compared to other bones of body. These fractures may affect functional as well as esthetic appearance hence must be diagnosed and managed properly to avoid future growth and developmental disturbances.[1,2] In several studies it has been found that 0.87% to 1.0% of facial fractures occur in children with age less than 5 years and 1.0 to 14.7% of fractures occur in patients older than 16 years.[3] Treatment modalities depend on various factors such as age, stage of dentition, child behavior, choice of anesthesia and socio-economic status of family. Although various methods are available, that is, open or closed but out of all closed reduction is the method of choice in pediatric patients. The main advantage of closed reduction in this age group is that it prevents injury to the developing dentition and avoids growth disturbances. Disruption of periosteum of body of mandible and presence of metallic implant may have an unpredictable effect on growth, thus if open reduction is not mandatory then closed reduction is preferred.[1]

Access this article online

Quick Response Code:

Website: www.njms.in

DOI: 10.4103/0975-5950.183872

Case Report

A 6-year-old girl reported to our unit with history of road traffic accident with a motorbike 1 month back [Figure 1]. There was no history of loss of consciousness, vomiting and convulsions. There was history of bleeding from oral cavity with presence of extraoral puncture wound present over the lower face. Her medical history was not suggestive of any previous systemic abnormality. Clinical examination revealed diffuse, tender swelling of the right lower anterior facial region and a discharging sinus over the face near the inferior border of the mandibular parasymphysis region. On intraoral examination, step and mobility was found between the right deciduous lateral incisor and deciduous canine of mandibular arch. Compression test was positive. There was no tooth fracture and mobility and none of the teeth were missing. Radiological examination revealed fracture line passing between the right deciduous lateral incisor and the deciduous

canine extending obliquely to the inferior border along the spaces present between the permanent tooth buds in a zig-zag pattern. Thus, it was suggestive of fracture of right parasymphysis of mandible [Figure 2]. All routine hematological investigations were within normal limits. Her parents were counseled regarding the condition and various management alternatives. Due to poor socioeconomic condition they were not willing for procedures under general anaesthesia. Then we planned an indigenous alternative for closed reduction with an 18-gauge hollow needle taken from the intravenous cannula [Figure 3]. The needle was modified by cutting it from both sides and curved to get the arch form [Figure 4]. Under local anesthesia, the precurved needle was aligned along the mandibular teeth and stabilized with 26-gauge wires from the deciduous second molar to the second molar of other side in arch bar fashion [Figure 5]. This resulted in achieving rigid fixation across the fracture line. Satisfactory occlusion was obtained. She was prescribed oral antibiotics and analgesics for next 5 days.

Figure 1: Pre-operative photograph of the patient

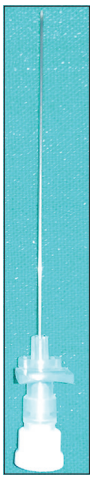

Figure 3: Hollow 18-gauge needle taken from intravenous cannula

Discussion

The main objective of treatment of paediatric fractures is to restore proper occlusion and stability to allow fracture healing without altering the developing dentition and the growing facial skeleton. Adaptive potential of the alveolar bone and the replacement of deciduous teeth by permanent dentition self-corrects the fracture and occlusion; so high degree of precision is not mandatory for the management of facial fractures in a pediatric patient as compared to adult.[4]

Mainly two types of techniques are used to manage the pediatric facial fracture. One is closed reduction and other is open reduction and internal fixation with bioresorbable plates and screws.[3] There is no absolute indication of open reduction but when fractured segment cannot be reduced properly, open reduction and internal fixation can be done. Also, the cost of bio-resorbable implants is too high. The requirement of general anesthesia or conscious sedation is another criterion in adoption of open reduction or closed reduction with circum-mandibular wiring. The anesthesia has some associated post-operative complications too and also prolongs the hospital stay. So the risk to benefit ratio is unpredictable. Most of the clinicians in general are also not very interested in advising procedures under general anesthesia to the pediatric patients. Rather they always think of some simple and better alternative for managing such conditions.

Most of the pediatric fractures are greenstick type, so conservative approach is preferred as the child grows

Figure 2: Orthopantomogram showing fracture of right parasymphysis of the mandible

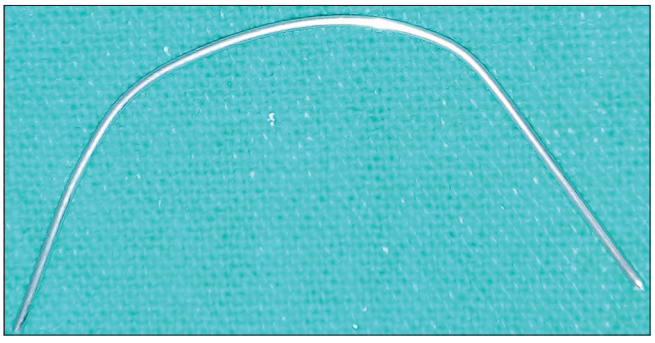

Figure 4: Needle curved to get arch form

Figure 5: Postoperative photograph showing fixation of needle as arch bar in the mandibular arch

the fracture heals rapidly. Other advantage of closed reduction is that it can be performed on outpatient basis under local anaesthesia so more patient compliance and cooperation is attained with fewer complications.[1,3]

In this case report, we have emphasized on the conservative approach for the management of 1 month old right parasymphysis fracture of mandible in a 6-year-old girl child. Arch bar used in cases of adult patients is simulated here by an 18-gauge needle removed from an intravenous cannula and given the shape of arch bar and closed reduction was done with the help of interdental wiring with needle adapted on the cervical third of mandibular teeth after manual reduction. Intermaxillary fixation was not required. The treatment outcome was highly satisfactory as proper occlusion was achieved with minimal intervention.

Hence, we can conclude that less invasive techniques for the management of minimally displaced mandibular fracture of a pediatric patient is required. Open reduction and internal fixation should be reserved for more displaced and complicated cases.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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How to cite this article: Kumar N, Singh AK, Pandey A, Verma V. An indigenous method for closed reduction of pediatric mandibular parasymphysis fracture. Natl J Maxillofac Surg 2015;6:206-8.

Source of Support: Nil. **Conflict of Interest:** None declared.