IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 23, Issue 1 Ser. 10 (January. 2024), PP 15-18
www.iosrjournals.org

Management Of Bilateral Parasymphysis Fracture In Pediatric Patient Using Spinal Needle For Circummandibular Wiring-A Case Report

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Abstract
Mandibular fractures in children are relatively rare, not only by their anatomical and physiological aspects, but also by their social factor, which makes this group less exposed to high-impact trauma. The aim of the treatment was to achieve the bony union, normal occlusion, restoration of normal form and function, and to avoid impediments to normal growth. In children, the mandibular cortex is thin and less dense than in adults, and the presence of the tooth buds must be considered when performing an open reduction. Trauma to the developing tooth buds and partially erupted teeth may occur when placing intraosseous wires or plates and screws for rigid fixation .In our case we have replaced a convention awl for circummandibular wiring with a spinal needle, which is disposable, having finer diameter, a sharp bevel and internal wire carrying capacity, clearly demonstrates statistically significant advantages over the usage of a conventional awl. significant reduction in post-operative pain and swelling were noticed in groupie. The operating surgeons experienced greater ease in using spinal needle, and the size of the entry and exit wounds were also relatively small as compared to using an awl.

Keywords *Management of pediatric mandibular fracture,conventional awl vs spinal needle in circummandibular wiring, billateral parasymphysis fracture management in children, pediatric trauma management using spinal needle for circummandibular wiring.*

Date of Submission: 20-01-2024 Date of Acceptance: 30-01-2024

I. INTRODUCTION

Pediatric fractures are unusual when compared with fractures in adults. The reasons for this statement are based primarily on social and anatomical factors. Most often children are in protected environments, under the supervision of parents and thus less exposed to major trauma, occupational acci dents or interpersonal violence, which are common causes of facial fractures in adults[1.] The treatment choice of fractures in the paediatric mandible depends on the age and the stage of tooth development, and this has to be considered when deciding various available options. In children, the man dibular cortex is thin and less dense than in adults, and the presence of the tooth buds must be considered when performing an open reduction. Trauma to the developing tooth buds and partially erupted teeth may occur when placing intraosseous wires or plates and screws for rigid fixation[2]. An understanding of the surgical or treatment options is essential for making informed choices to best manage these injuriesDistinctive to the pediatric growing jaw is the concern of dental development and potential complications and morbidity that occur as a result from the surgical manipulation in the developing teeth region. Pediatric maxillofacial complex is also malleable owing to a greater cancellous-to-cortical ratio. Greenstick fractures are more common in children. The osteogenic and bone remodeling potential is also greater in children than in adults[3]. This paper describes a case of a pediatric bilateral parasymphysis fracture where a closed reduction and immobilization was done using a clear acrylic splint stabilized with circummandibular wiring with the help of a 18G spinal needle. . In this article, we describe our experience of

comparing a new atraumatic technique for placement of circummandibular wires using an 18G spinalneedle with conventional awl in placing circummandibular wires.

II. CASE PRESENTATION

A 6-year-old boy was reported to the emergency department with the chief complaint of pain in the lower jaw. A history of fall from height one day back, no history of loss of consciousness, a seizure or ENT bleed, vomiting were reported.On an extraoral examination, a bruise present over the chin region and a deviation of chin towards the left side was seen. On an intraoral examination, lacerated wound with respect to 71 72 and 82 83 regions was noted and on palpation, step deformity was felt with respect to the same region. Malocclusion was present and sublingual hematoma was also noted. After a thorough clinical and radiographic examination (Fig. 2), the patient was diagnosed as having a bilateral mandible parasymphysis fracture and it was planned to manage the condition by means ofSplinting fractured paediatric mandible with acrylic splint retained by circummandibular wires using 18G spinal needle.Upper and lower arch alginate impressions were taken, and stone casts were poured. An acrylic splint was fabricated, and mandibular fracture was immobilized, fixed with the acrylic splint that was retained by circum mandibular wiring. Circummandibular wiring was done under general anesthesia by using 18G spinal needle in place of a conventional awl. The spinal needle was passed percutaneously from the submandibular region and exited in the lingual side close to the alveolus, and a 26-gauge wire was passed through the lumen of the spinal needle and clamped intraorally. The needle was then railroaded along the wire till the lower border of the mandible was felt. The needle was then passed on the buccal side in proximity to the bone. During the buccal insertion, the spinal needle was rotated such that the bevel was on the leading side and the wire on the nonleading side. The needle and the excess wire within were. Removed after cutting the desired length of wire intraorally at the bevel.The patient was kept on a soft diet and regularly followed up for 3–4 weeks.

III. DISCUSSION

The management of mandibular fractures in children differs somewhat from that of adults mainly because of the concern for possible disruption of growth. In children, the final result is determined not merely by initial treatment but by the effect that growth has on form and function[4]. The shape and shortness of deciduous crowns may make the placement of circumdental wires and arch bar slightly more difficult in children. While doing open reduction and fixation, the presence of tooth buds throughout the body of mandible must be a consideration as trauma to developing tooth buds may result in failure of eruption of permanent teeth and hence narrow alveolar ridge. Several studies have recommended the use of prefabricated acrylic splints as a treatment for pediatric mandibular fractures. These splints are more reliable than open reduction or intermaxillary fixation (IMF) techniques with regard to cost-effectiveness, ease of application and removal, reduced operating time, maximum stability during healing period, minimal trauma for adjacent anatomical structures, and comfort for young patients[5].Currently, ORIF with resorbable osteosynthesis plates and screws is increasingly being used in children. These biodegradable materials do not interfere with radiodiagnostic techniques due to their radiolucency and they are sufficiently rigid and stable. They eventually degrade, resorb and are eliminated from the body. Although the secondary implant removal operations are avoided and there are no side effects on the growing skeleton, the risk of damaging tooth buds in the pediatric jaw is still present due to drilling for direct application of the resorbable plates and screws.Eppleyclaims that this risk is minimal since the drill hole and the tapping of the screw penetrate only the outer cortex of the bone. Even if the resorbable screw tip encroaches upon a tooth, its tip is blunt and non-penetrating. Subsequent resorption of the screw removes any potential obstruction to tooth eruption[6].

IV. CONCLUSION

Pediatric trauma is a challenging entity for the surgeon. The choice of the ideal treatment modality ultimately depends on the presence of tooth buds and the maintenance of uninterrupted growth of the jaw bone. Thus, a well-thought-out and customized treatment plan should be devised for each individual case, the data presented here show that the treatment protocols used at the authors' center have yielded largely uncompromised mandibular function and growth thus far. We have replaced the use of conventional awl with the 18G spinal needle. Repeated use of an awl causes it to lose its sharpness. When using an awl, the crimped wire, which is potentially contaminated by oral fluids, is made to pass around the mandible. Using spinal needle the section of wire exposed to the oral cavity never touches the tissue, but the tip of the spinal needle is exposed to the oral cavity and enters the tissue. All patients were followed up for 2 months and shows uneventful healing and no other complications were seen. An instrument that is sufficiently sharp, leaves a smaller wound, is disposable, economical and freely available would be a welcome alternative to the conventional awl. This article describes the innovative technical modification of using a 18 gauge spinal needle to place circummandibular wires.

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Figure1: Cast poured and fracture line simulated and cast was cut using diamond disk bur and clear acrylic splint was fabricated.

Figure 2: Preop OPG showing bilateral parasymphysis fracture.

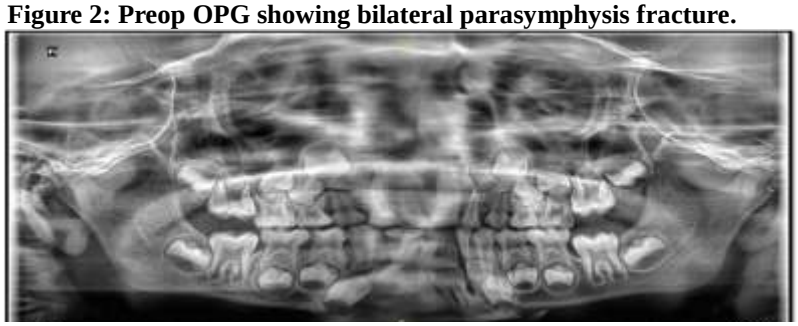

Figure 3: Intraoral photograph ,intraop photograph with acrylic splint stablized with circummandibular wiring and intraop photograph showing use of spinal needle in circummandibular wiring.

Figure 4:postop OPG showing circummandibular wires in the parasymphysis region.

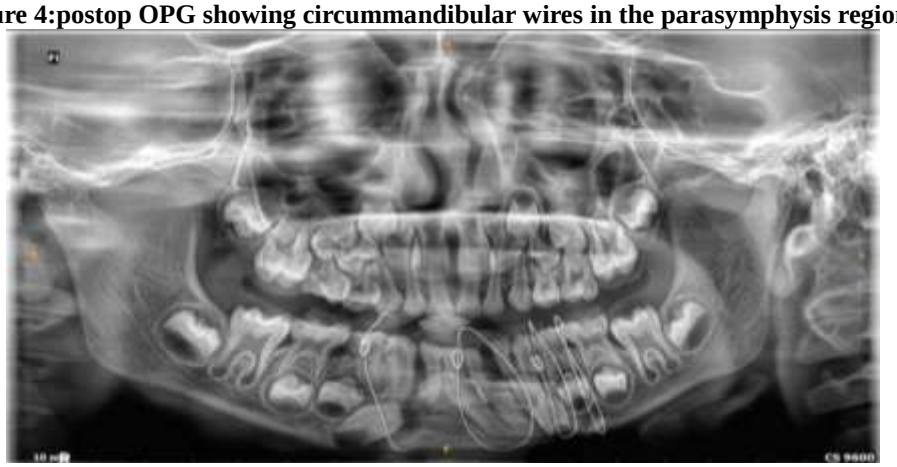

Figure 5:Post op OPG and intraoral photograps showing occlusion after 2 months of follow up.