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A Simplified Way for the Stabilization of Pediatric Mandibular Fracture With an Occlusal Splint

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Abstract: The management of pediatric mandibular fractures is challenging for maxillofacial surgeons due to ongoing mandibular growth involving tooth buds. The treatment of such fractures has been a topic of much research. Generally accepted methods for the treatment of mandibular parasymphyseal or symphyseal fractures in children are conservative approaches involving the use of acrylic splints, lateral compression with an open-cap splint stabilized by circummandibular wiring, and maxillomandibular fixation with an arch bar and eyelet wiring. The aim of this technical note was to describe a straightforward approach to the treatment of pediatric mandibular fractures, in which an occlusal splint is secured to prevent trauma to the soft tissue, without the need for general anesthesia.

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CLINICAL REPORT

A 9-year-old boy was referred to our Department of Oral and Maxillofacial Surgery with pain in the anterior mandibular region accompanied by mild bruising. The patient's parents reported that the boy had fallen while playing on the previous day. Clinical examination showed a gap between the mandibular right lateral and central incisors, with a small laceration on the buccal gingiva (Fig. 1A). A panoramic radiograph showed a slightly displaced vertical fracture in the parasymphyseal area, with minimal step deformity at the inferior border of the anterior mandible (Fig. 1B). No fracture of the mandibular condyles or other bony structure of the jaws was observed. The patient's medical history was unremarkable. As the patient had mixed dentition, a conservative treatment approach was preferred. First, maxillary and mandibular impressions were taken with alginate and cast models were made. To obtain the desired occlusal plan, mandibular cast surgery was performed with guidance of the maxillary cast. An occlusal splint (thickness, 2 mm) was then prepared with partial extension to the gingival tissues to enhance stability (Fig. 1C). The lingual and buccal flanges of the occlusal splint were adjusted at the gingival contact points to avoid pressure on the soft tissues.

As the patient was highly cooperative, all procedures, including impression taking and reduction of the mandible with placement of the acrylic splint, were conducted under local anesthesia. Initially, the occlusal splint was fixed to the mandible with two 0.5-mm orthodontic wires that had been twisted together to improve flexibility and strength. Small holes were made on the occlusal splint at the junction of the buccal and lingual parts of the deciduous second molar, and the wires were passed through the holes and interdental spaces. Before the creation of these holes, the mobility of the deciduous second molar was evaluated. The dislocated mandibular segments were readily reduced by digital pressure with the guidance of the occlusal splints, which were stabilized by twisting the wire on the buccal surface (Fig. 1D and E). Finally, the stability of the splint was verified.

At 3 weeks postoperatively, the occlusal splint was removed without local anesthesia. No complication was observed during the healing period. A panoramic radiograph taken 4 weeks

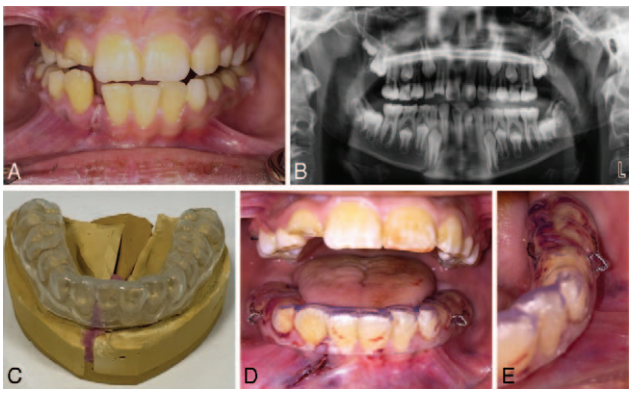

FIGURE 1. (A) Preoperative intraoral view showing deranged occlusion. (B) Panoramic radiograph showing a parasymphyseal fracture on the right side of the mandible, with step deformity at the lower mandibular border. (C) Occlusal splint preparation and proper placement on the cast model. (D) Securing of the occlusal splint symmetrically to the mandible with 2 twisted wires. (E) With the splint secured firmly, passage of the twisted wires through the interdental spaces of the deciduous second molar to ensure stability.

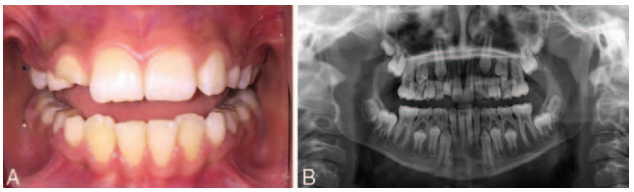

FIGURE 2. (A) Intraoral view showing excellent occlusal alignment of the mandibular right lateral and central incisors. (B) Panoramic radiograph taken 4 weeks postoperatively showing good reduction and healing of the fracture.

postoperatively showed good reduction of the mandible and healing of the fracture, with satisfactory occlusion and normal bite function (Fig. 2A and B).

DISCUSSION

Mandibular fractures in children can contribute to growth disturbance when treatment is insufficient or improper. However, the mandible has the capacity to heal rapidly in the early years of life, as the high osteogenic potential of the bone, large medullary space, and thick periosteum enable rapid consolidation and remodeling at a fracture site.[1,2] The immobilization time should thus be minimized to 2 to 3 weeks.[3] In the present patient, we left the occlusal splint in situ for 3 weeks, as recommended in reports of similar patients.[3,4]

The preferred technique for the reduction and stabilization of displaced anterior mandibular segments in pediatric patients is the fixation of acrylic splints to the alveolar process with circummandibular wiring.[3–5] However, this approach is considered to be traumatic because the irregular or twisted ends of the wire can damage the surrounding soft tissues when the awl passes along the mouth floor. The blunt end of an awl can also cause trauma.[6,7] Thomas and Yuvaraj[7] recommended an alternative, less-traumatic technique involving the use of a disposable 16-gauge intravenous cannula stillete; this method created smaller wounds and was more economical than the conventional awl technique.

The use of modified occlusal splints, referred to as open-cap splints, has been found to aid the achievement of proper occlusion in some patients.[3,4] Kale et al[3] reported that this approach reduced dependence on repeated x-rays and allowed patients to maintain oral hygiene and masticate soft foods. In their patient series, splints were stabilized with circummandibular wiring under general anesthesia.

The occlusal splint, supported by deciduous teeth, provided sufficient stability during fracture healing in the present patient. In cooperative patients, splints can be applied readily under local anesthesia and removed after fracture healing without anesthesia, as the twisted wires can be removed from interdental areas with minimal pain. However, the passing of wires through the interdental spaces and creation of holes on the splint during fixation may be considered disadvantages of this technique, as these procedures are time consuming. In addition, the teeth selected to support the occlusal splint should show no mobility. When the deciduous first and second molars do not provide sufficient stability, the permanent first molars can be evaluated.

Although stable reduction of pediatric mandibular fractures can be difficult to achieve with occlusal splint stabilization on the crowns of deciduous teeth and partially erupted permanent teeth, and this approach is not universally recommended,[3,4,8] the modified splint stabilization technique described in this report could be an alternative method. It can be performed under local anesthesia, particularly in cooperative patients, and has no harmful effect on mouth floor tissues. However, limitations of the technique should be kept in mind when making treatment decisions in patients of severely displaced symphyseal or parasymphyseal fractures, insufficient tooth stability, other concomitant mandibular fractures, and uncooperative patients.

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Preservation of Facial Nerve With Adjuvant Radiotherapy for Recurrent Mammary Analogue Secretory Carcinoma of Parotid Gland

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Abstract: Mammary analogue secretory carcinoma of salivary glands harbors the recurrent ETV6-NTRK3 gene fusion because of the translocation t (12; 15) (p13; q25) and resembles breast secretory carcinoma. This tumor composed of papillary, cystic, solid, and cribriform patterns. Immunohistochemically, the tumors

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