Commentary

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General Surgery at an Urban Safety Net Hospital

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Description

In the present case series, seven displaced fractures were reduced manually and immobilized using splints with circummandibular wiring, two cases were treated with arch-bar fixation, and one case involved a splint being cemented onto the arch. The case in which the splint was cemented showed delayed healing due to continuous dislodgement of the splint, which occurred because of dissolution of the cement **[1]**.

Also, resorbable materials have been made available as a fixation option for pediatric craniomaxillofacial fracture management. According to Peterson with the exception of mandibular condyle fractures judicious use of ORIF is preferable to the closed reduction and immobilization techniques with splints when treating fractures in the deciduous and mixed dentition **[2]**.

Previous research has shown the use of arch-bar fixation restricts normal dietary intake in children, resulting in significant weight and protein loss. Here in the present case series, maxillomandibular fixation was performed using light-training elastics so that an active exercise program could be started as soon as the child could cooperate. Extended periods of maxillomandibular fixation can lead to ankylosis in children and should be avoided. In cases of condylar fractures, nonoperative management is overwhelmingly popular, because minimal complications occur and the outcomes are good in both adults and children. Moreover, in older children, the bone has less capacity to adapt and remodel, and the ramus height may not be regained **[3]**.

Before inserting the arch bar, occlusion was checked to confirm full interdigitation of the teeth with regular contact. The prefabricated arch bar was adjusted in shape and length, with care taken to avoid damage to gingival tissue. In children with displaced fractures, the mandibular arch was reduced manually under general anesthesia with occlusion in the guidance position, and the acrylic splint was tried in. Stab incisions were placed in the submandibular and submental regions to facilitate the passage of a Kelsey-Fry mandibular bone awl, which was passed lingually along the body of the mandible through a stab incision and piercing the lingual mucosa. 26-gauge orthodontic wire was fed to the awl. A basic understanding of the development of the jaw and dentition will be useful for framing future discussions. During the fourth week of gestation, the embryonic maxilla and mandible arise from enlargement and fusion of paired bilateral prominences derived from neural crest cells around the primitive mouth, known as the stomodaeum. The skeleton of the mandible is derived using Meckler cartilage of the first pharyngeal arch as a template for membranous ossification. Interestingly, this cartilage does not contribute to the final mandible, but portions are retained as middle ear structures, including the malleus and incus **[4]**.

Functional Training with Elastics

Once the wire was secured to the awl, it was withdrawn until the tip of the awl reached the lower border of the mandible and then the wire was carefully passed on to the buckle sulcus along the body of the mandible, with care taken to prevent soft-tissue injury. One wire was passed on each side, taking precaution to avoid injury to the mental neurovascular bundle. The bar was adapted closely to the dental arch and placed between the dental equator and gingiva. The arch bar was extended to the last tooth on both sides in the oral cavity. The hooks were positioned symmetrically in the upper and lower jaws to achieve calculable tension forces on both the bars for functional training with elastics. To fix the arch bar in place, a ligature in the premolar region was prepared on each side. The arch bar was positioned and fixed using the wire twister **[5]**. The wire was cut with a cutter, and the ends were turned away from the gingiva to prevent damage. Maxillomandibular fixation was performed with elastics for intraoperative management of the occlusion Management of mandibular fractures in children differs somewhat from that in adults because of several considerations, including anatomic variation, rapidity of healing, degree of patient cooperation, and the potential for changes in mandibular growth. It is more difficult to make use of the teeth in children for fixation, because deciduous teeth may be either insufficient in number or their roots may be resorbed and permanent teeth may be incompletely erupted. The shape of the deciduous crown is also not favorable for retention of wires and splints, being bell shaped with little undercut area. Elasticity of the bone in children, the relatively small size of the face, and the growth process in the young bone is also among the factors that influence the pattern of fracture and its management and also depends on the postoperative period of fixation. Ankylosis of the temporomandibular joint causing impairment of function is more common in children and damage to the condylar growth

center can result in facial deformity. This paper focuses on the assessment, evaluation, and treatment of mandibular fracture in young children by ORIF **[6]**.

Treatment Modality of Fractures in the Pediatric

The teeth are derived from a combination of ectoderm and ectomesenchyme of the head, which is itself derived from neural crest cells. Tooth development is a complex process that is beyond the scope of this review **[7]**. Simplified, the overlying ectoderm, or dental lamina, invaginates into the underlying ectomesenchyme. This invagination induces cellular proliferation in the ectomesenchyme, which subsequently forms the dental papilla. These developing ectomesenchymal cells are contained in a sac known as the dental follicle. Eventually, the overlying dental lamina forms the ameloblasts (which produce the outer tooth enamel), the dental papilla forms the dental pulp and the odontoblasts (which produce dentin), and the follicle forms the cementum as well as the periodontal ligament (which anchors the tooth to the underlying alveolar bone) **[8]**.

The treatment modality of fractures in the pediatric mandible depends on the patient's age and stage of tooth development. Minimally displaced fractures can be treated by soft diet, analgesic use, and antibiotic prophylaxis **[9]**. However, in very young children, healing might be prolonged because of insufficient cooperation in following postoperative instructions. In such cases, fabrication of a splint and cementing onto the arch can be used to overcome these hindrances. Dentigerous cyst, or follicular cyst, is not only the most common pediatric odontogenic cyst; it is the most frequently encountered lesion of the mandible in children after dental caries. It results from expansion and fluid accumulation within remnants of the dental lamina and usually presents in the second decade of life. Dentigerous cysts are typically asymptomatic unless they are large with associated mass effects on the teeth, are infected, or are complicated by pathologic fracture **[10]**.

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