MANAGEMENT OF MANDIBULAR PARASYMPHYSIS FRACTURE IN A PAEDIATRIC PATIENT BY IMF SCREWS : A CASE REPORT

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Abstract
Intermaxillary fixation (IMF) is used for management of jaw fracture. Some of the commonly used technique of IMF include arch bar and various dental wirings. However IMF may not be efficiently attained in pediatric patients, edentulous, partially dentulous or have compromised dentition using these traditional techniques. The purpose of this article is to report a case of Mandibular parasymphysis fracture of 14 year old patient managed successfully by IMF screws and to highlight its merits and demerits.
Key Words:IMF Screws,ArchBar,Mandibular Fracture .

Introduction

Mandibular fracture, also known as fracture of the jaw, is a break through the mandibular bone. In about 60% of cases the break occurs in two places. It may result in a decreased ability to fully open the mouth. Often the teeth will not feel properly aligned or there may be bleeding of the gums.
A study by Morris et al found the proportion of various types of mandibular fractures (4143 fractures; 2828 patients) to be as follows:

- Angle (27%)
- Symphysis (21.3%)
- Condyle and subcondyle (18.4%)
- Body (16.8%)[2]

A study by Jung et al of 1172 mandibular fractures (735 patients) found the symphysis to be the most frequent fracture site, accounting for 431 fractures (36.8%).[3]
Intermaxillary fixation (IMF) is a basic and fundamental principle in the management and treatment of the patients with maxillofacial injuries. Traditionally arch bar and various dental wiring techniques are commonly used for management of various jaw fractures.
This article is to report a case of mandibular parasymphysis fracture managed successfully by IMF screws with a short duration of four week time period.

Case Report

A 14 year old boy reported to the department with the history of trauma. Pain and tenderness present in the anterior mandible region, and the patient reports malocclusion. Step deformity in the mandible is usually evident.
Preoperative examinations are often impaired by tenderness and masticatory muscle spasm; therefore examination of the face and oral cavity is performed prior to definitive therapy. The entire mandible is carefully inspected and palpated. All teeth are inspected and evaluated for injury and mobility. A survey of the dental arches is completed to detect any sockets missing teeth. The maxilla is examined to detect any previously missed injuries. Step deformity with tenderness was elicited along the lower border of mandible on the left side canine region. Preoperative orthopantomogram taken.

Treatment

IMF screws were inserted either through perforation of the closed mucosa or after an open approach after exposing the bony surface. The screw tip should not fully penetrate the inner cortical layer. Similar level screws are also inserted in the other alveolus too. A wire is bent around both the screw heads and the ends held together, twisted & buried inwards. Thinner wires with hanger plates may be used for long-term fixation. Wires & screws are removed when the necessaity is over.

Indications

1) Long-term fixation of maxillo-mandibular fracture
2) Simple alveolar fracture
3) Transverse palatal fractures
4) Alveolar fracture in edentulous person
5) Open fracture

Contra-indications

1) Alveolar fractures needing dental splinting
2) Sagittal palatal fracture (needs plating)
3) Multiple maxillo-mandibular fractures
4) Severe bony atrophy
5) Pathological bone
6) Unerupted teeth/ dental follicule

Materials

Titanium / ss screws with or without hanger plates, 26 gauze wire for temporary/ 22 gauze for long-term, drill.

Figure 1: *Extra oral view*

Figure 2: *Extra orally right side swelling*

Figure 3:*Right side,not in proper occlusion*

Figure 4:*Left side in occlusion*

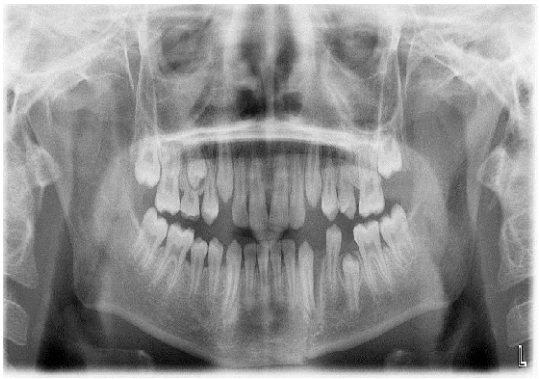

Figure 5: *Preoperative OPG*

Figure 6: *Intra Operative IMF Screws*

Discussion

Falls are one of the main causes of mandibular fractures in children.[10,11] The need to diagnose and classify the type of fracture in children is extremely important, as these patients are in a phase of bone growth and any injury may lead to problems such as ankylosis, temporomandibular joint disorders in the growth process, inflammation of joints. Blunt trauma can injure any part of the mandible. A sharp blow applied anteriorly, often fractures the symphysisl or parasymphysis region and the condyle region.

The Fractures of the symphysis parasymphysisare inherently unstable. Muscles of mastication insert into posterior portions of the mandible with superior rotation about the axis of the temporomandibular joint. The suprahyoid muscles of the neck act directly on the anterior mandible, with inferior rotation around the axis of the temporomandibular joint and scissoring motion around a vertical axis through the symphysis by the mylohyoidmuscles. Fractures of the anterior mandible lack 2 of the stabilizing factors provided to fractures of the posterior tooth-bearing mandible: the splinting effects of the masseter and internal pterygoidmuscles, which form a natural sling, and the interlocking cusps and fossae of bicuspid and molar teeth.[14,15] The incidence of maxillofacial fractures in children is confirmed as being generally rare although the incidence increases with age. There are two approaches to management. The first is conservative therapy with soft diet and/or minimalfunctional inter-maxillary fixation (IMF). The second approach is applied in more complex fracture patterns in both young and theadult patient, usingtechniques standard for adult management. This includes rigid IMF and open reduction and internal fixation (ORIF)

In children, the pre-injury skeletal and dentoalveolar anatomy and function are re-established by the anatomic reduction of fracture based on occlusion. Children have a greater osteogenic potential and faster healing rate than adults and hence anatomic reduction in children should be accomplished earlier and the immobilization time should be shorter i.e 2-3 weeks andnon-union or fibrous union is almost never seen in pediatric patients. These factors allow for a much greater potential to remodel even in imperfectly reduced fractures. Oral and maxillofacial surgery has undergone great progress with the development of conventional titanium plates and screws for osteofixation. However, osteofixation with these metal devices is sometimes associated with drawbacks. Some patients develop allergic reactions to the metal, which can cause inflammation and the need for removal of the metal. Protruding screws and plates under the skin can be irritating and may be painful. The use of resorbable plates m in treatment of osteofixation in the growing infant also avoids a translocation of the material, which is seen with metallic devices through the natural growth of the infant. The material is resorbed before its translocation. They promise initial strength followed by eventual degradation, resorption, and elimination from the body. The good tissue acceptance enables a normal healing pattern of the bone. Avoidance of secondary implant removal operations and therefore reduction of overall costs are advantages for the patient with emphasis on the pediatric patient. The amount of trauma is reduced, not only physical but psychological as well.

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