Original Article

Maxillofacial Surgery

Management of Mandibular Fracture in Paediatric Patients at L.U.H Hyderabad

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ABSTRACT

Objective: The study was conducted to analyze the different treatment options practiced in pediatric mandibular fracture patients at L.U.H Hyderabad.

Introduction: Maxillofacial fractures are infrequent in the pediatric population, and their treatment is unique due to the psychological, physiological, developmental and anatomical characteristics of children. Besides this it is difficult to examine child both clinically and radiographically.

Study Design: Retrospective Study

Place and Duration of Study: This study was carried out in Department of oral and maxillofacial surgery L.U.H Hyderabad for a period of two years i.e. from June 2010 to June 2012.

Materials and Methods: Gender distribution Total 180 patients, 118 patients (65.6%) were males and 62 patients (34.4%) were females. Most common site involved was parasymphysis, involved in 85 (47%), in other sites angle in 43 (23%), condyle 25 (13%)cases, symphysis 15 (8%), body 10 (5%) and ramus in 2(1%).

Results: Most of the patients were treated with IMF with arch bar i.e 75 (41%). Clearer understanding of paediatric pattern of mandibular fractures will help out health care providers as they plan and manage the treatment of mandible fractures in children.

Conclusion: The most common site involved in these patients is mandibular parasymphysis. Clearer understanding of pediatric pattern of mandible fractures will help out oral maxillofacial surgeon as they plan and manage the treatment of mandible fractures in children.

Key Words: Pediatric Fracture, Mandible Fracture, Arch Bar

INTRODUCTION

Paediatric maxillofacial trauma is a unique and well focused branch of Trauma, as a child's face has protective anatomic features, growth consideration, higher cranial to facial skeleton size, softer and more elastic bone, protective thick soft tissues, etc.[1]

The incidence of facial fracture in children has been well recognized although less common than in adults.[2] Maxillofacial fracture is rare below the age of 5 year and their incidence increases as children begins schooling.[3] The principles of management of mandibular fractures differ in children when compared to adults, because in the adults complete reduction and fixation of fractures is indicated, and in children minimal manipulation of facial skeleton is mandatory.[4]·The reported incidence of pediatric injuries accounts for 4-6% of the total. Below the age of 5 years, the incidence of pediatric facial fractures is even lower[5]. The principles of management of mandibular fractures differ in children when compared to adults. While in the adults, absolute reduction and fixation of fractures is indicated, in children minimal manipulation of facial skeleton is mandated.[6] wound healing among children emerges as a promising sign to start with. The growth potential of children is much more as compared to adults and they also possess potential of self-correction of minor discrepancy in occlusion due to the remodeling process.[7] Meanwhile mixed dentition presents a problem for intermaxillary fixation in child patients. The goal of treatment of these fractures is to restore the underlying bony architecture to pre-injury position, in a stable fashion, as non-invasively as possible, with minimal residual esthetic and functional impairment.[10]

Depending on the type of fracture and the stage of skeletal development the treatment modalities range from conservative non-invasive through closed reduction and immobilization methods to open reduction with internal fixation[8]. Disruption of the periosteal envelope of the mandibular body may have an unpredictable effect on growth. Thus, if reduction is required, closed reduction is favored.Amongst the facial fracture mandible fracture is the second most common fracture after the nasal bone fracture as reported in hospitalized trauma patients.[9] The most common fracture in children requiring surgical intervention involves the mandible, in which angle, condyle and subcondylar region account for approximately 80% of mandible fracture and symphysis and parasymphysis accounts for 15-20% and body fractures are uncommon

In treating such fractures, the goal is to re-establish pretraumatic function and esthetics of the dentofacial complex with limited morbidity, without hindering future growth and development and without damaging the underlying developing dentition. This is achieved

by reduction of the fracture site to its original anatomical alignment followed by stabilization with fixation.[10]

MATERIALS AND METHODS

A retrospective study of 180 pediatric patients with mandible fracture under the age of 12years was carried out in Department of oral and maxillofacial surgery L.U.H Hyderabad for a period of 2years i.e. from June 2010 to June 2012. Hyderabad has a total area of (3,198km2)km ^{2} and according to the official census data the total population is estimated to be (5 million) distributed in of urban and rural area. Our hospital is tertiary referral center for Sind province and primary referral unit for emergencies in Hyderabad. Data was collected from the hospital record of patients L.U.H Hyderabad. included, gender of pediatric patient, site of fracture mandible. these patients was studied for different treatment options used like

- Conservative treatment
- IMF with arch bar
- IMF with eyelets
- IMF with hook arch bar with elastics
- Occlusal acrylic splints
- Plating ORIF

Data was computed and analysed using SPSS Version 17.

RESULTS

From June 2010 to June 2012, 180 children patients below the age of 12 years were treated with different options at the department of Oral and Maxillofacial Surgery Liaquat University Hospital Hyderabad. Gender distribution for injuries shows that out of 180 patients, 118 patients were treated both male and female Detail show in Figure 1. Anatomical distribution of fracture of mandible were parasymphysis, involved in 85 (47%)cases, in other sites angle in 43 (23%)cases, condyle 25 (13%)cases, symphysis 15 (8%) cases, body 10 (5%)cases and ramus in 2(1%) cases.Mention in Figure (2) . Most of the patients were treated with IMF with arch bar 75 (41%) cases. Detail show in Table (1) under heading Treated cases

Gender Distribution Male: 65.6%, Female: 34.4%

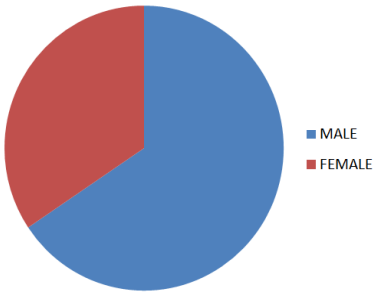

Figure No.1: Male female ratio

Table No.1: Treated cases.

treatment option	no: of cases treated	
conservative treatment	23 cases	12%
imf with arch bar	75 cases	41%
imf with eyelets	35 cases	19%
imf with hook arch bar with elastics	15 cases	8%
occlusal acrylic splints	18 cases	10%
plating orif	14 cases	7%

Site Involvement

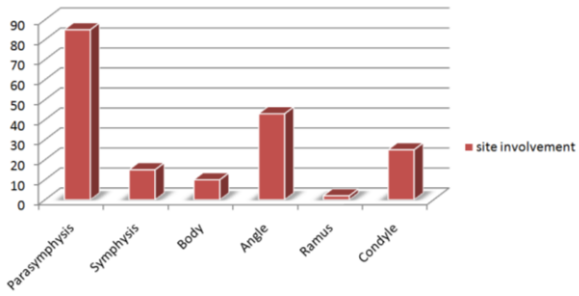

Figure No.2: Anatomical site of mandible fracture

DISCUSSION

Treatment of mandible fracture in kids depends on the split class and the phase of skeletal and dental growth. Mandible enlargement and expansion of dentition are the main concern as organization pediatric mandible fractures. In adults, total reduction and fixation of fracture is indicated, whereas in children minimal exploitation of the facial bones is mandated.[11] The tiny size of the jaw, existing vigorous bony growth centers and the packed deciduous teeth with permanent tooth buds located in huge closeness to the mandible and mental nerves, all considerably increase the treatment related risks of pediatric mandibular fractures and their growth associated abnormalities.Intact vigorous mandibular growth centers are significant for preserving mandibular function, which have a significant influence on future facial development.[12.] therefore, re-establishment of the mandibular stability after fracture is vital not only for instant function and moreover for potential craniofacial development. therefore, the objective of management is to reinstate the original skeletal architecture to its pre-injury position in a stable appear up to as non-invasively as possible with minimum remaining esthetic and functional mutilation.[13]

Pediatric patients present a exclusive confront to oral maxillofacial surgeon since of the nature and type of injuries persistent by children are frequently dissimilar from adults. management options for paediatric fracture patients comprise soft diet, intermaxillary fixation (IMF) with eyelet wires, arch bars, circummandibular wiring, or acrylic occlusal splints, percutaneous skeleteal fixation and also it depends on the fracture type and the stage of skeletal and dental

development.[13,14,] substitute options include open reduction and internal fixation through either an intraoral or extraoral approach. There is general preference for conservative or closed approach towards the fractures in pediatric cases due to multiple reasons like fear of damage to developing teeth, stripping of excess periosteum, remarkable healing capacity of bone in children, scar development, fear of growth restriction after placement of metallic plates[1516]

In our experience we treated most of mandibular paediatric patients by closed approach using IMF with arch bars. Because of our local limitations working in Govt hospital setup like: Lack of resources and large number of patients and according to the study conducted by Eppley BL in 2005 and also clinical data are in support of good results after closed reduction.[817] If we use the option of ORIF plating or screws in paediatric patients it risk potential growth and teeth development which is also been suggested by the study conducted by Senel FC in 2006, it also supports that good results can be achieved by close reduction.[91819] Sometimes open reduction and internal fixation becomes necessary as for example in cases with bilateral condylar fracture with symphysis or parasymphysis fracture of mandible, but in our experience we limited the ORIF for displaced body/ angle/ parasymphysis or symphysis fracture.[19.20] We have also seen bioresorbable plate fixation for paediatric fracture patients in developed countries,[3 21] but here working in government hospital setup .Lake of facility .availability of bioresorable plate.because of import from out side country scioecnomic condition of patient , budget of hospital cost and duration of operation under general anesthesia. lake of understaning of parents belong to rural area as well as illiteracy, a lot of patient flow in public sector hospital are major barrier. So that preferably conservative treatment better option for management of pediatric fracture.

CONCLUSION

One of the most satisfying and yet challenging aspect of surgical practice is the management of patient who has suffered facial trauma. Injuries in Maxillofacial trauma are relatively uncommon in children. As age increases, the severity of injuries sustained also increases.This study demonstrates that in our population most common treatment modality applied for the management of pediatric patients with mandibular fractures is arch bar with IMF due to various reasons discussed. The most common site involved in these patients is mandibular parasymphysis. Clearer understanding of pediatric pattern of mandible fractures will help out oral maxillofacial surgeon as they plan and manage the treatment of mandible fractures in children.

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