



Case Report

## Management of Maxillofacial Trauma in Paediatric Patient with Open Cap Splint

Mohammad Arif Lone<sup>1</sup>, Mohammad Shakeel<sup>2</sup>, Mohammad Imran<sup>1</sup>, Ramanpreet Ranauta<sup>3</sup>

<sup>1</sup>Registrar, <sup>2</sup>Associate Professor,

Department of Maxillofacial Surgery & Dentistry, Sher-I-Kashmir Institute of Medical Sciences, Srinagar, J & K.

<sup>3</sup>Department of Prosthodontics, Swami Devi Dyal Hospital & Dental College, District Panchkula, Haryana.

Corresponding Author: Mohammad Arif Lone

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### ABSTRACT

Face is very delicate structure and it defines the identity of humans. Injury of the face requires treatment to restore the functions as it has proximity to very important structures like respiratory passage and brain case. Children's are very prone to craniofacial trauma due to their greater cranial mass to body ratio. About 50% of paediatric trauma cases are found between the ages of 8-12 years. The cause of trauma can be fall from a height. Sports injuries, hit by animals, Road traffic Accident. Treatment of any maxillofacial injury depends upon preservation of life, maintenance of function and restoration of appearance. This can be achieved by open or closed reduction of the maxillofacial trauma. In paediatric patients due to growth of skeletal bone and dental buds open reduction and rigid internal fixation may lead to inhibition of growth and development so closed reduction may be performed by using cap splint fixed to the teeth by performing circum mandibular and circum Zygomatic wiring.

**Keywords:** Condyle fracture, Symphysis and Para Symphysis Fracture, Maxillofacial injury, Open Cap Splint

### INTRODUCTION

Trauma with accompanying fracture of teeth is a tragic experience for young patient. <sup>[1]</sup> Fracture of the middle third of the facial skeleton and or the mandible is known as maxillofacial skeletal injuries. <sup>[2]</sup> Though facial injuries are much less in children than adults during the first five years of life. <sup>[3]</sup> Children too had a lot of maxillofacial injuries and the main reasons are fall from heights, road traffic accidents, sports injuries, mine accidents, train accidents, animal bites gunshot injuries, pathology

(cyst / tumour). <sup>[4]</sup> the most general facial fracture is mandible followed by nasal and maxillary/zygoma. The girl to boy fraction is 3:5 and the connote age group of fracture is 3-11 years and one out of every two children sustain a dental injury. <sup>[5]</sup> During growth there are chances that fracture can be through the tooth crypts but it is rarely necessary to remove the teeth. <sup>[6]</sup> The patient should be checked for nausea, vomiting, drowsiness, or possible cerebral spinal fluid leakage from the nose or ears which is suggestive of skull fracture. <sup>[7]</sup>

The purpose of this case report is to give an insight of the maxillofacial trauma patient and the way to manage the paediatric trauma patient with mandibular parasymphysis and Condyle fracture. The symphysis and parasymphysis constitute about 20% of the maxillofacial fractures. [8]

## CASE REPORT

A paediatric male patient (7 year old) reported to the Department of Maxillofacial Surgery & Dentistry SKIMS MC & H – Bemina, Srinagar (J & K) with history of trauma due to fall resulting in fracture of his left side of jaw bone involving condyle and body of mandible. The patient when reported to the department was conscious,



Figure 1. Extra Oral View.

After taking the proper history and examining the patient for signs and symptoms. The findings were verified with conventional tomography and a provisional diagnosis of left Condyle and parasymphysis fracture was made.

The pre injury skeletal and dental abnormality is checked and is restored to its previous natural position. Children have greater osteogenic potential and the bones heal at faster speed in comparison to an adult so the period of immobilisation is less (2 weeks) compared to (4-6weeks) for an adult. Children also have the limitation of internal fixation with plates and screws. Placing plates may lead to sacrifice or

well oriented to time, place and person. There was no history of convulsions or vomiting.

### **Examination:**

Extra oral examination revealed a diffuse oedema mostly on the left side of face. On digital examination fracture on the left side of body of mandible was palpable; a contused lacerated wound was present below the chin. Intra oral examination revealed mixed dentition. Fracture line was present posterior to the deciduous molar region. OPG and CT of the patient revealed favourable fracture of left Para symphysis region involving the inferior border of the mandible anteriorly going superiorly and posteriorly to the molar region.

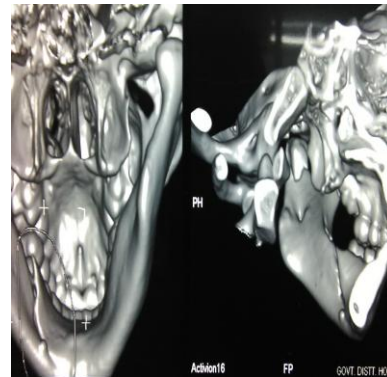


Figure 2. CT Showing Fracture.

inhibition in the growth of the permanent dentition as the teeth are still in their phase of growth and development.

### **Prosthetic Management**

In the present case the smallest size of upper and lower perforated impression trays (UO & LO) were selected. The impression of the maxillary and mandibular arch was made using alginate and casts were poured in type III die stone.

The casts were removed after half an hour from the impression and placed in water for five minutes before applying separating medium (cold mold seal) and were left to dry. Cold cure polymethyl methacrylate was used to make the open cap

splint using sprinkle on technique. The splint was fabricated while keeping the teeth space open and three hooks were attached to the splint one at anterior and two at rare molar region. These single hooks used were



Figure 3. Alginate Impression.

The cap splint was made to follow the cervical contour of the teeth for proper stabilisation and infra occlusion of splint was maintained throughout dentition so that it will not interfere during surgical splinting. The splint was finished and polished using rag wheel and sand paper. The splint was checked in patient's oral cavity for fit and extensions before surgery.

**Surgical Management**



Figure 5. Open Cap Splint with Hooks.

General anaesthesia was given to the patient and bone owl was used to enter lingual to the body of the mandible, piercing the lingual mucosa and the opening through

cut from arch bar so that they can hold the elastics during post surgical period. The hooks were attached in the acrylic more towards the labial side away from occlusion.



Figure 4. Upper & Lower Cast.

Maxillofacial trauma patient should be evaluated for patent airway, balance of fluids and electrolyte level before surgical approach. [9] Before operating reduction of the fracture site should be done using occlusion as a guide. [10,11] Children have faster healing than adult patients so the immobilisation time should be reduced in children usually 2-3 weeks compared to 4-6 weeks in adults. [12-15]



Figure 6. Circum Mandibular Wiring.

the lingual vestibule. On reaching the lingual vestibule, wire was passed through the hook of the bone owl and the bone owl was taken downwards along with the wire

attached to it on the same path but without removing bone owl from the lower mucosa once it reached the inferior border of the mandible.

On feeling the inferior border of mandible the direction of bone owl was changed buccally and the buccal mucosa was pierced till the bone owl passed through the buccal vestibule, the wire was freed from the bone owl and the bone owl was removed.

Circum mandibular wiring was done on anterior region and other side of mandible also. Acrylic cap splint was then placed and stabilised on the teeth and the

wire was looped around the splint and twisted in a clockwise direction in the respective regions. The extra wire was cut and the pointed ended of wire were bent toward the splint to avoid injury of mucosa.

In case of maxillary arch the wire was passed buccally from distal of deciduous molar to the palatal side followed by bending it and passing it through the palatal contact area mesial to the molar. The same procedure was done on the other side. Open cap splint was placed and stabilised on the teeth followed by looping the wire around the splint in a clockwise direction.



Figure 7. Wiring in Maxillary Arch.



Figure 8. Post Operative Occlusion.

After stabilising the open cap splint on the mandibular and maxillary teeth elastics were placed on the hooks of the splint and so that immobilisation of the mandible could be maintained. The patient was put on fluid diet for two weeks and the open cap splint was removed after two weeks.



Figure 9: Post Surgical.

## CONCLUSION

Maxillofacial fracture is very common in children or adults. The patient should be managed at the earliest with conservative measures. The degree of fracture determines the treatment procedure, in case of paediatric patient symphysis and parasymphysis fracture should be treated by open cap splint as bone plating can lead to damage of the developing tooth buds. The reduction period is also less compared to adults due to higher osteogenic potential and faster healing rates.

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