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### RESEARCH ARTICLE

#### ARMOUR IS HEAVY, YET IT IS A PROUD BURDEN- CAP SPLINT: A CASE SERIES

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#### Abstract

Traumatic injuries during childhood can have a considerable influence on the minds of growing children. For the purpose of supporting bony framework to pre-trauma condition, minimal manipulation of facial skeleton is necessary. In comparison to adults, the mandible in children have embedded tooth buds that hold the mandibular fragments together like a glue. Open reduction with rigid fixation is not recommended in fractures of the mandible in children. The goal of the treatment is restoration of the bony architecture in a stable position with a minimum malfunction and aesthetic disability. The purpose of the present case series is to demonstrate cap splint as a conservative and effective treatment modality for the management of pediatric mandibular fractures.

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#### Introduction:-

Facial trauma in children can often be challenging to manage with long-term consequences involved and the psychological impact.<sup>1</sup> Maxillofacial fractures in pediatric population consist of less than 15% of all facial fractures with Mandibular fracture being the most common.<sup>2</sup> The incidence of mandibular fracture in children ranges from 0.6% to 1.2% with the most typical causes of fracture in children being falls (64%), traffic incidents (22%), and sports-related accidents (9%).<sup>3</sup> The incidence of facial fractures is higher in boys than in girls with a male preponderance ranges from 1.1:1 to 8.5:1. Closed reduction techniques with maxillomandibular fixation in very young children can pose several concerns, including cooperation, compliance and adequate nutritional intake.<sup>4</sup>

The displaced mandibular fractures are managed by cap splints with circum-mandibular wiring, cap splint cemented onto the arch, and Erich arch-bar fixation.<sup>5</sup> Cap splint is a simple, easy to fabricate and more reliable method. It has other advantages like ease of application and removal, less time consumption, cost-effectiveness, good stability during healing period and minimal trauma to surrounding tissues.<sup>3</sup>

#### Case 1:

A 7-year-old boy reported to the Department of Pediatric Dentistry with the chief complaint of pain in lower jaw with associated tenderness in chin region and difficulty in opening mouth. Patient had a history of fall from the height 1 day back. There was no history of loss of consciousness or vomiting. Intraoral examination revealed tenderness along the lower border of mandible on right side of canine region. Preoperative OPG showed right mandibular parasymphseal fracture between 41 and 82. The primary impressions were taken with alginate and two

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sets of casts were subsequently poured. Mock Surgery and Articulation of casts was done and a modified closed acrylic cap splint was fabricated. Displaced Fractured fragments were reduced under local anaesthesia and a closed cap splint was cemented to the reduced fractured jaw with help of luting GIC. Oral hygiene instructions were given to the patient and analgesics were prescribed. After 3 weeks the splint was removed and the patient was asymptomatic. At follow-up, an OPG revealed healing of the fracture site after 6 months of follow up.



**Preoperative Intraoral photograph**



**Preoperative OPG showing right mandibular parasymphysis fracture.**



**Cap splint cemented with luting GIC**

**Post-operative Intraoral photograph**



**Post-operative OPG at 6 months follow up: Healing of parasymphyseal fracture**

**Case 2:**

A 2-year-old girl reported to the Department of Pediatric Dentistry with the chief complaint of Trauma due to fall 1 day back. There was no history of loss of consciousness or vomiting. There was associated soft tissue laceration on lower lip and chin with Positive Coleman's Sign. There was a step deformity in mandible with associated fracture of right mandibular parasymphyseal region. The primary impressions were taken with alginate and two sets of casts were subsequently poured. Mock Surgery and Articulation of casts was done and a modified closed acrylic cap splint was fabricated. Displaced Fractured fragments were reduced under local anaesthesia and closed cap splint was cemented to the reduced fractured jaw with help of luting GIC. Oral hygiene instructions were given to the patient and analgesics were prescribed. After 3 weeks the splint was removed and the patient was asymptomatic. At follow up there was correction of step deformity.



**Preoperative Photograph Cap splint cemented with luting GIC**



**Post-operative Photograph**

**Case 3:**

A 3-year-old girl reported to the Department of Pediatric Dentistry with the chief complaint of pain in lower jaw with associated tenderness in chin region and difficulty in opening mouth. Patient had a history of fall on the same day. There was no history of loss of consciousness or vomiting. Intraoral examination revealed tenderness along the lower border of mandible on right side of canine region. The primary impressions were taken with alginate and two sets of casts were subsequently poured. Mock Surgery and Articulation of casts was done and a modified closed acrylic cap splint was fabricated. Displaced Fractured fragments were reduced under local anaesthesia and a closed cap splint was cemented to the reduced fractured jaw with help of luting GIC. Oral hygiene instructions were given to the patient and analgesics were prescribed. After 3 weeks the splint was removed and the patient was asymptomatic.



**Preoperative Photograph**



**Closed cap splint cemented with luting GIC**



**Post- operative Photograph**

### Discussion:-

In Pediatric age group, Facial fractures account for about 5% of all facial fractures with the most common cause being fall from height, road traffic accident, sports injuries, etc.<sup>6</sup> The high tooth to bone ratio predisposes the mandible to fracture compared to the midface.<sup>7</sup> Mandibular fracture sites include Condyle (55%), Parasymphysis (27%), Body (9%), and Angle (8%).<sup>8</sup> The various symptoms of mandibular fractures include Pain, Swelling, Trismus, Occlusal derangement, Sublingual Hematoma, Step- deformity, Deviation, Loss of sensation, Open bite.<sup>9</sup> Pediatric patients presents a unique challenge to oral surgeons because of anatomic variation and changes in the mandibular growth.<sup>6</sup> Therefore, the management of the pediatric patients with maxillofacial injury should take into consideration the differences in anatomy and physiology, particular stage in growth and development, degree of compliance, complexity and any concomitant injury, anatomic sites injured, and the time elapsed since injury.<sup>9</sup>

The primary goal in the treatment of mandibular fractures is Reestablishment of Occlusion. Various techniques utilized in management of paediatric fractures include Tape muzzles, Circumferential wiring, Acrylic splint, Percutaneous skeletal fixation, Open reduction, Resorbable plates, Modified orthodontic brackets, Rubber elastics in combination with orthodontics brackets, Nickel titanium staples.<sup>6</sup> In the present case series, cap splint has been used for the stabilization of mandibular fractures as Cap splint is a promising fixation technique and provides for Occlusion guided fracture reduction, Maximum stability during healing period, Ease of application and removal, Reduced operation time, Minimal trauma for adjacent anatomic structures, Ease of maintenance of oral hygiene, cost-effectiveness and Comfort for young patients.<sup>5</sup> Therefore, the closed cap splint should be a reliable method in minimally displaced mandibular fractures in pediatric patients.

### Conclusion:-

The present case series shows that the conservative management of fractured pediatric mandible is cost-effective, safe and a minimally invasive procedure with good prognosis and almost complication free outcome and the role of a pediatric dentist is vital in managing children with such fractures.

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