

MANAGEMENT OF PATHOLOGIC PEDIATRIC MANDIBULAR FRACTURE: A CASE REPORT

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ABSTRACT

Pediatric fractures of jaw present a unique challenge to faciomaxillary speciality. Management of facial and dental injuries in children requires the clinician to address the child's particular stage of development and modify the approach to reconstruction based on the effects repair will have on future growth and development.^{1,2,3,6,12} Although fracture mandible is most commonly seen secondary to trauma, very rarely aggressive and uncontrolled odontogenic infections may lead to weakening and pathological fracture of jaw.^{2,5,7} This is an interesting case report which documents the management of pathological fracture mandible in a 6 year old.

INTRODUCTION

Facial fractures are less common in children than in adults, specially during first 5 years of life. Overall these fractures account for approximately 5% of all facial fractures.^{6,15} Child's sheltered atmosphere, soft bone consistency and decreased facial mass and proportion all contribute to minimal incidence of facial fractures.^{6,7,15} Although young children are more prone to falls, the shorter distance and decreased body mass do not generate significant force to result in facial fractures.⁶



FIG 1: Swelling on lower left

Among the facial fractures, nasal fractures are most common. Mandibular fractures are the second most common fracture reported in hospitalized pediatric trauma patients.^{4,5} Mid face fractures are rare in children, because of Retrusive position relative to calvaria. In Pediatric patients the angle, condyle and subcondylar region accounts for approximately 80% of mandibular fractures.^{1,5} Symphysis and parasymphysis fractures account for 15% to 20%, body fractures are rare.^{6,15}

Various etiological factors for mandibular fracture can be categorized into 1) fall 2) road traffic accidents 3) sports related injuries 4) child abuse and 5) pathological fractures.^{3,4,6} Due to introduction of antibiotics and increased awareness among parents towards child health care, the incidence of pathological related fractures has become rare entity. Odontogenic infection, orofacial cyst and tumors, vascular lesions can be some of the common pathological factors which may lead to jaw fracture.¹¹



FIG 2: Intra-oral view showing GIC filling in relation to left D and E tooth



FIG 3: OPG- SHOWING FRACTURE MANDIBLE LEFT SIDE

CASE REPORT

A 6 year old female patient reported to our department with a chief complaint of pain and swelling on the lower left side of the face since 10 days. She gave history of filling done in one of the lower left posterior tooth region 2 week back.

On extraoral examination, there was an oval shape swelling measuring upto 4 x 4 cm, extending Antero-posteriorly from 1 cm behind the angle of mouth upto posterior border of ramus, and supero-inferiorly it was extending from zygomatic arch region to the lower bor-



FIG 4: MANDIBULAR OCCLUSAL VIEW- SUGGESTIVE OF FRACTURE

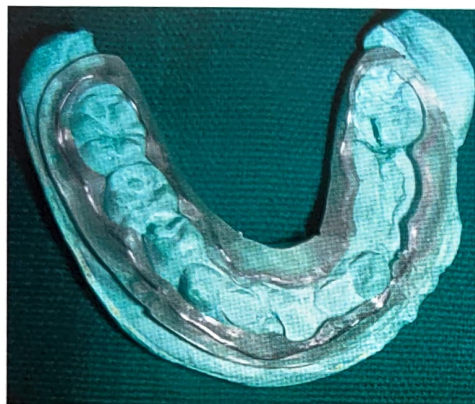


FIG 5: Wire reinforced cap splint constructed on the lower cast

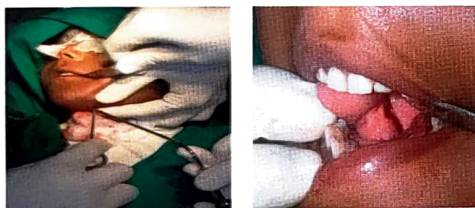


FIG 6: Bone awl entered lingually along the body of lower border of mandible and can be seen piercing the lingual mucosa



FIG 7: Circummandibular wiring completed on both sides and the splint stabilised

der of mandible. Mouth opening was found to be slightly reduced. There was complaint of pain by the patient during opening and closing movement of the mandible. Left submandibular lymph node was enlarged and palpable measuring upto 2 x 2 cm. On intra-oral



FIG 8: 6 month post-OP photograph showing no facial deformity and restoration of smile



FIG 9: Restoration of occlusion



FIG 10: 6 month Post Op Occlusal radiograph showing well healed lower border of mandible

examination there was deranged occlusion. GIC filling was present in relation to lower left first and second deciduous molars. Draining sinus was present over the attached gingiva in relation to the lower left first molar region. There was pus discharge from the sinus. Derangement of occlusion was more evident on left side. On palpation the step deformity was present in relation to lower border of mandible on left side.

Orthopantomogram, mandibular occlusal view and intra-oral periapical views of left molar region and anterior region was taken as a part of radiographic investigation.

OPG finding was suggestive of fracture mandible; fracture line was running downward and anteriorly from deciduous second molar region upto the lower border of mandible.

Both D and E tooth on left as well as

on right side showed sign of periapical infection on the radiograph. There was evidence of separate comminuted type of fracture lines on the condyle and angle region of mandible on left side

Occlusal view and IOPA confirmed the above mentioned findings of OPG.

Pus culture was obtained and sent to laboratory for sensitivity testing. Results were suggestive of mixed aerobic and anaerobic infection, but the predominant microbe was E.COLI. Organisms were found to be susceptible to most of the commonly used antibiotics.

TREATMENT PROTOCOL

After proper investigation we came to the diagnosis of fracture mandible secondary to odontogenic infection. During formulating a treatment protocol, first priority given was to control the infection.¹³ Both the infected deciduous molars were extracted, Antibiotic (amoxycillin + clavulanic acid) and analgesic (diclofenac sodium) were prescribed for 1 week. After 1 week the infection was found to be under control and the decision was taken for circummandibular wiring. Impression of lower jaw taken and MacLennan type cap splint was fabricated on it.

Mandibular fracture was reduced and stabilized with cap splint under general anaesthesia.

Circummandibular wiring was done by placing small stab incision on the inferior border of mandible on right and left side 4-5cm from the mid-line. Mandibular bone awl was used to enter lingually along the body of mandible and piercing lingual mucosa wire was fed and passed onto buccal sulcus along the body of mandible. Wire held together and the splint stabilized by winding wire in clockwise direction.

Circummandibular wiring was kept in place for 4 weeks, subsequent follow-up of the patient showed adequate healing of the fracture.

DISCUSSION

Management of mandibular fractures in

➤ research section

children differ from adults, because of anatomic variation, rapidity of healing, degree of cooperation from the patient and potential for interference with mandibular growth.^{2,5,10} Although most clinicians assess the growing patient by the individual's size, children are categorized in their stage of life by their developmental age

- Infants - newborn to 1 year of life
- Child- 1 to 11 years
- Adolescent- 11 to 19 years^{1,3}

Adequate treatment of mandibular fractures should accomplish several goals. Restoration of occlusion, function, and facial balance is necessary for therapy to be considered successful.^{5,10,11} Proper treatment may prevent complications such as growth disturbance and infection. The specific treatment of mandibular fractures depends on ^{2,3,4,10}

- location of the fracture
- degree of bony displacement
- occlusal status
- dentition status of the child
- methods of fixation vary by dental status

Before age 2 years, the deciduous teeth are not completely erupted. Children at this stage of development are treated like an edentulous patient. An acrylic splint may be fixed in place with circummandibular wires. If immobilization of the jaw is necessary, the splint may be fixed to both occlusive surfaces with both circummandibular wires and wires through the pyriform aperture.^{3,4,9} Once deciduous teeth are established, at about ages 2-5 years, they may be used for fixation. Although the deciduous teeth are conically shaped (rather than having a cervical waist), interdental wiring may be used. Mini-arch bars attached with resin may be used to treat nondisplaced fractures, again avoiding immobilization of the mandible.^{11,13} In children aged 5-8 years, deciduous molars may be used for fixation. When adequate dentition is not available for fixation, Gunning splints may be used as in the younger patient.^{4,7,8} In children older than 9-12

years, standard intermaxillary fixation (IMF) with arch bars is possible because enough permanent dentition has been established. Braces may also be used briefly for fixation.^{7,8,9} In case of pathological fractures the underlying cause should be addressed first, followed by definitive management of fracture.^{1,2} Odontogenic infections if left untreated may lead to osteomyelitis of mandible, which basically involves the medullary portion as well as the cortex of mandible, due to which the capacity of mandible to bear the tensile or compressive strain decreases and it becomes very susceptible to fracture.^{1,2,3}

CONCLUSION

Pathological fractures although very rare in present scenario, may involve the facial bones because of susceptibility of oral cavity towards odontogenic infection.^{1,6,15} In case of fractures of infectious origin the underlying infection should be addressed first, which include removing the source of infection, and appropriate antibiotic therapy based on culture and sensitivity test.^{1,3,4}

Rapid healing and the possibility of remodelling decrease the duration of immobilization necessary in the pediatric patient. The rapidity of healing also dictates that management of the fractures should occur early.^{1,2}

In conclusion facial trauma in children can often be challenging to manage with long-term consequences involved. The pure joy and satisfaction derived after treating such children is unparalleled !!

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