Management of Bilateral Condylar Fractures:Case Review

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Introduction

Unilateral mandibular condylar fractures occur approximately three times more frequently than bilateral fractures [1]. Fracture of the mandibular parasymphysis region is usually associated with fracture of contralateral condyle. Unilateral fracture condyle may occur as an isolated case or along with fracture of mandible or other facial bones. Unilateral condylar fractures without displacement, are generally treated conservatively using arch bars and intermaxillary fixation (IMF). It is rare to see bilateral fracture condyle without any other associated fracture. Deranged occlusion, inability to masticate food, difficulty in opening mouth, haemotympanum and pain in preauricular region are some of the complaints of patients. In bilateral subcondylar fractures the dilemma remains whether to manage it conservatively, perform open reduction and bone plating of one side only or perform open reduction and bone plating of bilateral condyles. The age of the patient, the level of fracture, angle of displacement, dislocation of condylar head and presence of other associated fractures influences a surgeon's decision.

The growth of the mandible continues throughout childhood and adolescence. So in children, IMF is restricted to fourteen days to facilitate early movement and to prevent ankylosis of temporomandibular joint (TMJ). Four cases of bilateral condylar fractures are being reviewed.

Case Report - 1

A 28 year old serving soldier sustained trauma on his chin from a fire extinguisher. He had right haemotympanum, bleeding from mouth and avulsion of four teeth. There was no history of unconsciousness. After primary care, he was evacuated by air to a referral hospital. Examination of the patient revealed, anterior open bite, restricted mouth opening, restricted lateral movement of mandible, step deformity in bilateral parasymphysis region, fractured crowns of 36, 37, 45, 46, avulsed 44, 43, 31, 32 and swelling in the floor of mouth near midline. The condylar heads could not be palpated

bilaterally. There was no falling back of tongue. Reverse Towne's and postero anterior view of mandible revealed bilateral fracture at the neck of condyle with medial displacement of both the condylar heads and parasymphysis fracture with downward displacement of anterior fracture fragment. Arch bars and elastics were used to achieve occlusion and patient was taken up for open reduction and rigid internal fixation (RIF) under general anaesthesia (GA). An Alkayat and Bramley's modification of preauricular incision was used. The right TMJ was exposed and the condylar head was retrieved from its medially displaced position. After reduction, bone plating was done and hemostasis achieved. A corrugated rubber drain was inserted and the wound was sutured in layers. Intra orally a circum vestibular incision was given from left lower second premolar to right lower second premolar region. Mandibular degloving was done. A loose fragment of bone devoid of periosteal attachment was removed. The mandible had split sagittally resulting in the lingual cortex and labial cortex being pulled apart by muscular attachment. Bone plating was done from 45 to 33 region. Wound was sutured and TMJ movements were checked. Post operatively the patient had an uneventful recovery. Intermaxillary elastics were used to maintain occlusion for a period of three weeks, at the end of which his mouth opening was 38mm and occlusion was normal. Lateral movement of mandible was restricted. Jaw opening exercise was advised.

Case Report -2

A 13 year old patient fell from the roof of a school building, resulting in fracture of right sub condyle and neck of left condyle, exfoliation of 31, 32, 41, 42 and right parasymphysis fracture. There was overlapping of fracture fragments in right and undisplaced fracture condyle left. Open reduction and bone plating of right sub condylar fracture and right parasymphysis fracture was done under GA. The left condylar fracture was managed conservatively. Partial denture was provided for the missing teeth. Patient was reviewed after two months. Patient's occlusion was normal and his mouth opening was within normal limits.

Case Report - 3

A 27 year old serving soldier fell down from a tree and sustained bilateral condylar fracture, left zygomatic arch and

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left zygoma fracture. Open reduction and bone plating of left condylar fracture, left zygoma and left zygomatic arch was done under GA. Post operatively IMF was done for three weeks, after which, jaw opening exercise was started. His occlusion and inter incisal opening returned to normal after four weeks.

Case Report - 4

In June 2005, a 32 years old serving soldier sustained trauma on his chin when the cylinder of a soda acid type of fire extinguisher recoiled and hit his face, resulting in bilateral condylar fracture and fracture of symphysis of mandible (Fig. 1). Both the condylar heads were displaced medially. Open reduction and bone plating of right subcondylar fracture and symphysis fracture was done under GA. There was foreign body reaction to bone plates in the symphysis region. Hence those bone plates were removed (Fig. 2). IMF was maintained for three weeks. The patient had an uneventful recovery. He was reviewed after nine months and there was no restriction in lateral movement or protrusive movement of mandible. His occlusion and inter incisal opening returned to normal.

Discussion

In four cases of bilateral subcondylar fracture, open reduction and bone plating was done on one side only within seven days from the date of injury, using the preauricular approach. Generally a submandibular, preauricular or intraoral approach is used to access the

condyle [2]. However, Riu de G et al [3], use a variant of the retromandibular approach. It consists of making a cutaneous incision on the surface of the mandibular angle and over the masseter muscle between the buccal and marginal mandibular branch of the facial nerve. Though this approach permits a better control of the condylar neck region, it produces a prominent scar.

While occlusion and inter incisal opening are two important parameters to judge the success of a procedure, the other parameters are deviation of mandible on opening, left and right lateral movements and protrusion of the mandible. In the present series all the patients were followed up for one year. The patients were free from pain, occlusion was normal and interincisal opening was within normal limits. When must a surgeon resort to open reduction? This question is best answered when one goes through the absolute indications given by Zide et al [4], for open treatment of subcondylar fractures viz. dislocation into the middle cranial fossa or external auditory canal, lateral extracapsular displacement, inability to obtain adequate occlusion and open joint wound with foreign body or gross contamination. The relative indications given by Zide et al [4], for open treatment are bilateral subcondylar fractures in a patient without dentition splinting is impossible because of alveolar ridge atrophy, when splinting is not recommended for medical reasons and

Fig. 1 : Radiograph reverse Towne's view of mandible showing bilateral condylar fracture and symphysis fracture

Fig. 2 : Radiograph PA view mandible showing bone plates at right condyle and symphysis

adequate physiotherapy is impossible, fractures associated with comminuted midfacial fractures and those associated gnathologic problems, such as retrognathia or prognathism, open bite with periodontal problems or lack of posterior support, loss of multiple teeth bilateral condylar fractures with unstable occlusion due to orthodontics, and unilateral condylar fracture with unstable fracture base.

Conservative management of bilateral condylar/subcondylar fracture leaves behind a residual deformity, especially when the condylar head is displaced medially because of the action of lateral pterygoid muscle. Even though the fracture is bilateral, it is possible to achieve good functional result by open reduction and bone plate fixation of unilateral condyle. The advantages of open reduction of one side only are that it reduces the degree of scar on the face and decreased possibility of damage to the branches of facial nerve and blood vessels with reduction in operating time. However maintenance of IMF for a period of 3-4 weeks is a big disadvantage.

The success of the method of treatment adopted is greatly aided by the bone remodelling and functional adaptation that takes place. No substantial functional difference was found by Hidding et al [5], when they compared 34 surgically and non surgically treated patients. There was deviation in opening in 64% of patients treated conservatively as against 10% in surgically treated ones. Lateral movements were limited in the nonsurgical group but not in the latter. Haug and Assael [6], compared 10 patients of sub condylar fracture who were conservatively treated with 10 in whom open reduction and internal fixation (ORIF) was done. They found few differences in outcome between these two groups of patients. Villarreal et al [7], in an analysis of 104 mandibular condyle fractures found that the functional improvement obtained by open methods was greater than that obtained by closed treatment. Open reduction also increased the incidence of post operative condylar deformities and mandibular asymmetry. Newman [8], evaluated 61 patients of bilateral condylar fractures of which only 9 (15%) were managed by ORIF. He found that the most common complaint after treatment was persistent limitation in mouth opening which was less in the ORIF group mean (44 ± 2 mm) than in conservatively managed group (28 ± 2 mm), $p < 0.01$. He concluded that if either of the condyles is displaced, ORIF is the most satisfactory method of treatment.

In all the cases though patients had bilateral condylar fracture, open reduction and bone plating of one side only prevented reduction of ramal height and gave clinically satisfactory result. In fourth case, though ORIF was done on one side only, lateral movement or protrusive movement of mandible was not restricted. Though some authors claim that condylar cartilage is a primary growth centre for the mandible and others support the functional matrix theory of Moss [9], it is universally accepted that the condyle plays an important part in mandibular growth. Fractures in growing children are generally treated 'closed', but unilateral open reduction and bone plating in a child aged 13 years (case report 2) has given good result.

The Consensus Panel at Garoningen in Netherlands commented that "there is good evidence that displaced bilateral fractures would benefit from at least one side being treated open" [10].

Conflicts of Interest

None identified

References

1. Goldman KE. Fractures, mandible, condylar and subcondylar. e medicine.com. e medicine World Medical Library:2005:1-12.
2. Kempers KG, Quinn PD, Silverstein K. Surgical approaches to mandibular condylar fractures: a review. J Craniomaxillofac Trauma 1999; 5:25-30.
3. Riu de G, Gamba W, Anghinoni M, Sesanne E. A comparison of open and closed treatment of condylar fractures : a change in philosophy. Int J Oral Maxillofac Surg 2001; 30:384-9.
4. Zide MF, Kent JN. Indications for open reduction of mandibular condyle fractures. J Oral Maxillofac Surg 1983; 41: 89-98.
5. Hidding J, Wolf R, Pingel D. Surgical versus non surgical treatment of fractures of the articular process of the mandible. J Cranio Max Fac Surg 1992 : 20 : 345-7.
6. Haug, RH, Assael, LA. Outcomes of open versus closed treatment of mandibular subcondylar fractures. Journal of Oral and Maxillofacial Surgery 2001; 59:370-5.
7. Villarreal PM, Monje F, Junquera LM, Mateo J, Morillo AJ, et al. Mandibular condyle fractures : determinants of treatment and outcome. J Oral Maxillofac Surg 2004 ; 62:155-63.
8. Newman L. A clinical evaluation of the long-term outcome of patients treated for bilateral fracture of the mandibular condyles. Br J Oral Maxillofac Surg 1998;36:176-9.
9. Moss ML. The functional matrix hypothesis revisited. The role of mechanotransduction. Am J Orthod Dentofacial Orthop 1997; 112: 8-11.
10. Bos RR, Ward Booth RP, De Bont LG. Mandibular condylar fracture: A consensus. Br J Oral Maxillofac Surg 1999;37: 87-9.