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Case Report

Extracorporeal Fixation of a Severly Displaced Mandibular Condyle Fracture: Case Report

Dr. Philip Mathew[1], Dr. Anu Chowdary Vattikuti[2], Dr. Partho Shankar Chakraborty[3], Dr. Kaushal Charan Pahari[4], Dr. Dani Mihir Tusharbhai[5], Dr. Ajay Mittal[6], Dr. Rahul Vinay Chandra Tiwari[7]

[1]MDS, HOD, OMFS & Dentistry, JMMCH & RI, Thrissur, Kerala, India
[2]Intern, Sibar Institute of Dental sciences, Guntur, AP, India
[3]Assistant Professor and Consultant Maxillofacial Surgeon, Shankaracharya Institute of Medical Sciences, Bhilai, Chattisgarh, India
[4]PG Student, OMFS, Surendra Dental College & RI, Sriganganagar, Rajasthan, India
[5]Second Year Postgraduate, Manipal College Of Dental Sciences, Manipal Academy Of Higher Education, Mangalore, India
[6]MDS (OMFS) Senior Lecturer, Guru Nanak Dev Dental College and Research Institute, Sunam, Punjab, India
[7]FOGS, MDS, Assistant Professor, Department of Oral and Maxillofacial Surgery, Sri Sai College of Dental Surgery, Vikarabad, India

***Corresponding author:** Dr. Philip Mathew
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Abstract

Mandibular high condylar fracture is still challenging task for oral maxillofacial surgeon to go for open reduction and internal fixation. Due to the complex anatomy of temporomandibular joint. Most surgeon prefer closed reduction for such fractures. However, some prefer opening and fixing it in correct form and position to achieve appropriate function. Some cases require fixation of the fracture segment outside the socket and refixation with the rest segment which is termed as extracorporeal fixation. Hereby we present a similar case report of 21-year-old male with difficulty in opening and closing mouth and DE arranged occlusion following road traffic accident. On radiographic investigation medially displaced right high condyle and left sub condylar fracture was detected and open reduction and internal fixation was done by extracorporeal fixation of right segment and normal fixation of left segment. extracorporeal fixation is an effective method for management of displaced and dislocated condylar fracture to achieve proper form and function.

Keywords: mandibular fracture, condyle, extracorporeal fixation.

INTRODUCTION

Management of mandibular condyle fracture is always controversial. Prompt diagnosis is compulsory for prompt management. Basic to advanced modalities are available to diagnosis the extent and displacement of condylar fracture. Orthopantomogram, posteroanterior view of mandible, cone beam computed tomography and 3-D computed tomography scan are reliable imaging techniques. Open and closed reduction are modalities of treatment. Intermaxillary fixation is method of closed reduction and opening the fracture site followed by reduction and fixation with plates and screws is the open reduction technique.in some cases performing an ORIF makes it difficult to reduce and fix in an appropriate way in such circumstances extracorporeal fixation method is used in which the condylar fracture with Ramal fragment with rest of the screws. This is performed because it is difficult to manipulate and locate the displaced fragment is also problematic to hold it in position and fixation due to its proximity to important anatomical structures. Condylar fractures account for 25%-35% of all mandibular fractures [1]. Mandibular condyles are anatomically susceptible to fractures because external force tends to focus on the region [2]. Such fractures cause occlusal dysfunction, temporomandibular joint (TMJ) dysfunction, mandibular movement dysfunction, and facial deformities; therefore, proper treatment of condylar fractures is essential in preventing such problems. Treatment modalities are divided into two broad categories: conservative treatment and open reduction. Treatment choice depends heavily on the surgeon's preference and the selection criteria are still under debate. Those in favor of open reduction stress the importance of anatomical reconstruction and early recovery of mandibular function [3-5]. In 1983, Zide and Kent [6] proposed guidelines for absolute and relative indications for open reduction. However, in cases of superiorly positioned fractures with antero-medial displacement of condyle fragments, the standard approach can be difficult. Many studies report difficulty in access, visualization, fixation, and the dangers of harming nearby structures, such as the parotid gland or facial nerve [7]. Extracorporeal fixation utilizing vertical ramus osteotomy, first performed in 1981, could be a method to resolve these problems [8]. Since then, a number of studies on extracorporeal fixation have been pubIlished [9-11].

CASE REPORT

21-year-old male patient reported to our emergency department with a history of fall from motorcycle about 4 days back and was seen by the medical officer in hospital elsewhere. He reported to our hospital with a complaint of pain on the right side of temporomandibular joint during jaw movements. On clinical examination patient was unable to open mouth to wide extent and was also having difficulty and pain while mouth opening and closing. A diffuse swelling was present on right temporomandibular joint and mild swelling was present on left temporomandibular joint. On intraoral examination all the teeth were present and no noticeable dental injury was seen. Derangement of occlusion was present. Clinical examination was suggestive of bilateral mandibular condylar fracture. An orthopantomogram was taken which showed medially displaced type5 high condylar fracture on right side and sub-condylar fracture on left side. An intermaxillary fixation was done to achieve normal occlusion for later placement of osteomised segment in the proper anatomical location on the right side. Risdon Incision was placed through submandibular approach. After dividing the platysma, the parotid and Masseter junction exposed. The area next to the anterior edge of the parotid gland is usually relatively free of branches of facial nerve, making this an ideal point to dissect down to the fracture. After carefully dissecting and retracting the parotid, masseter muscle divided at the angle. By sub periosteal dissection the sigmoid notch exposed and retractor placed. By probing the soft tissues with curved mosquito forceps, the condyle was identified by its consistency and was retrieved from the medial aspect after releasing the pterygoid muscle. The condylar segment was placed back in the position to confirm its correct form so that no other remnants should be left in the area. a straight 4-hole plate gap was used and was adapted to condylar head with the help of 7-0 bur a vertical hole was placed in such a manner so that the broad area of contact is achieved. The condyle is placed back in its position and rest 2 holes were fixed in the sub-condylar region by achieving proper anatomical reduction. For a better achievement of fixability and stability of the joint one more 2-hole plate was fixed lateral to the fractured segment. Left sub-condylar fracture underwent normal open reduction and fixation. The patient was not on intermaxillary fixation postoperatively and was advised to have soft diet. Patient achieved appropriate occlusion, mouth opening and mandibular movement (Figure-1).

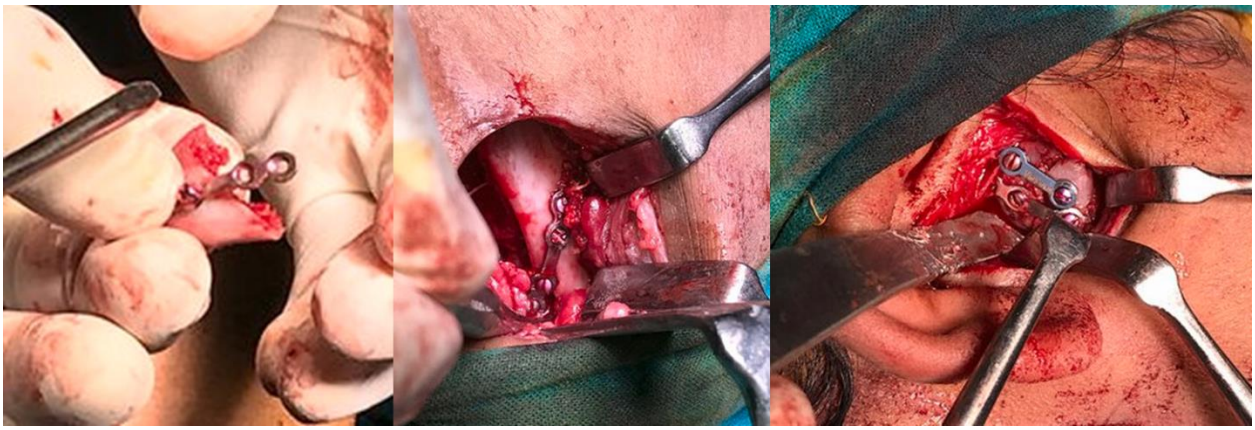

Fig-1:

DISCUSSION

The prevalence of a mandibular condyle fracture is relatively high compared with other type of mandibular fracture. The mandibular condylar fractures are broadly classified as intra-capsular and extra – capsular and treatment modalities either by open or closed method [12]. Zide and Kent [12, 13] formulated absolute indications for open reduction. Open reduction by standard surgical approaches like pre-auricular and or end aural are difficult because of anatomic position and proximity of the facial nerve [14]. Localization of the displaced or dislocated fractured bony fragment also makes procedures more difficult by these approaches. Many surgeons have selected closed method and treatment shown favorable results [14]. But some conservative treatments had complications such as malocclusion, facial asymmetry, TMJ pain, loss of vertical height of ramus [15]. In case of severely displaced condylar fractures open reduction may give better results [16]. In case of high or superiorly positioned fractures with antero-medial displacement standard approaches can be difficult in term of access, visualization, fixation and dangers of causing damages to adjacent structures such as parotid gland and facial nerve. Extra corporeal fixation utilizing vertical ramus osteotomy first performed [16, 17], could be a method to resolve above problems. In our case bringing back the normal occlusion was difficult due to shortening of the ramus and pull of the mandible to the left side. The extracorporeal reduction and fixation [15-17] is planned due to high level head fracture into two fragments and severe antero-medial displacement of the fracture condylar head. Approaches to the fractured condylar head is usually by pre-auricular or End aural. We used

submandibular approach via Risdon incision [17, 18]. During the dissection we followed the trans masseteric antero parotid (TMAP) technique advocated by Wilson *et al*., [19], which offers swift access to the condylar neck while substantially reduces the risk of injuring the facial nerve and eliminates the postoperative complication. In gross displacement of the fragment it is easy to locate by vertical sub sigmoid osteotomy [15, 20] through submandibular approach [15, 20, 21] since it is a quick, leaves a small less conspious scar, fractured fragments can be perfectly aligned, minimal risk to the facial nerve injury, access to the mandibular ramus is maximum [22]. The plates pre-fixing, planned osteotomy done exactly as practiced by many authors [16, 19]. The localization of the dislocated head was not easy hence we probed for hard consistency in the soft tissue. As most of the surgeons used miniplates [22, 23] while fixing the fractured segment we differed due to comminuted fracture of the head and also partial loss of segment. We have done wire osteosynthesis [22-24] to preserve more volume of bone and helps in good union. After fixing it in the precise plane, the patient's mouth opening was perfect. Most of the authors have practiced immobilization [17] for 1 or 2 weeks we did not do any immobilization from the beginning. This is mainly due to patient developed immediate postoperative sinus tachycardia (heart rate above 160/min) which subsided after removing the Ryle's tube and Foleys catheter as it was psychologically disturbed him. Extracorporeal fixation even though it is unique, compromising the vascularity [24] of the osteotomized segment is still possible. Fixing the fractured head to the free Ramal graft without detaching the lateral pterygoid [15] will be difficult to reposition due to intervening soft tissues. Explanted fractured segment act as free graft [24-26] and shows condylar resorption [15, 24].

CONCLUSION

The decision for open or close reduction is by the surgeon keeping in mind bringing back normal function and esthetics of the patient. Severely displaced condylar fracture invariably warrants open reduction. To overcome demerits of closed method, proper anatomic alignment of the condyle, direct ramus visualization, retrieval of medially dislocated fractured fragment and fixation by extracorporeal method using vertical ramus osteotomy is valuable Hence, extra corporeal reduction and fixation of condyle has remained to be a good choice of technique to achieve perfect alignment, absolute Maintenance of vertical ramus height, occlusion and facial symmetry in case of severely displaced, dislocated high condylar fractures. But the limitation with this technique is a broad exposure, damage to facial nerve and parotid gland and avascular necrosis of the free Ramal graft segment.

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