

A Rare Case Report - An Unusual Bilateral Superolateral Dislocation and Sagittal Fracture of Condyles of Mandible

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Abstract

Dislocation of the joints occurs very commonly in the body, of which Temporomandibular joint dislocation is a rare phenomenon that accounts for about 3% of all dislocation. In Temporomandibular joint dislocation the mandibular condyle is displaced anteriorly beyond the articular eminence and is well documented in the literature superior, lateral, and posterior dislocation of the condyle is rare with only a few reports documenting superolateral dislocation with anterior mandible fractures have been published in the past. However such dislocations without any associated fractures are even rarer. This report documents a case of superolateral dislocation of

mandibular condyle along with symphysis fracture of mandible in a 20-year-old male following a traumatic incident. This paper also discusses about previously documented case reports and focuses on the causative mechanism, dynamics, and management of such dislocations.

Keywords: Temporomandibular Joint, Subluxation, Dislocation, Lingual Splaying.

Introduction

Hippocrates, in the 5th century BC, described this condition of Temporomandibular Joint Dislocation and its management. His method of reduction has survived the ages and is used in modern times. Sir Astley Cooper

proposed principles for the diagnosis and treatment of dislocation of the lower jaw in 1832, and coined the terms 'subluxation' (incomplete dislocation) and 'luxation' (complete dislocation). Whenever the dislocated condyle returns back to the glenoid fossa voluntarily or by self manipulation it is termed as subluxation or incomplete joint dislocation. Dislocations can be either acute, which cannot be self reduced or chronic also known as habitual or recurrent dislocation.¹ Complete dislocation of the mandibular condyle may occur in four directions viz., anterior, posterior, lateral, and superior. Dislocation is more common in the anterior direction (owing to the pull of the lateral pterygoid muscle) than in the other three directions, which are rare. Lateral displacement of the intact mandibular condyle was first reported in 1849 by Robert and is a rare complication of injury to the mandible.² A case of superolateral dislocation of the bilateral condyle associated with anterior mandibular symphysis fracture is reported herein. To date, 28 cases of superolateral dislocation have been documented in the English language literature, with only two of these cases showing such a dislocation without any associated facial fracture. This report reviews the literature on superolateral dislocation of the condyle, provides an insight into the possible causative mechanism, and provides information for the diagnosis and management of such cases.

Case Report

A 20-year-old male patient reported to emergency of ITS Dental college Ghaziabad, with the history of road traffic accident followed by inability to open mouth since 1 day. There was no history of loss of consciousness, bleeding from ear, nose while history of oral bleeding was positive. As explained by the patient he described the nature of injury from front when he was riding a bike and had head on collision with a four wheeler and fell on the road side with the bike on top of him. Clinical examination

revealed generalized facial edema with multiple chin skin lacerations. (Fig. 1) There was a sutured wound over the chin and the patient had marked trismus. There was a significant bilateral swelling extending superiorly from preauricular region to chin region inferiorly. (Fig. 2) An intraoral examination showed avulsion of upper anteriors in trauma with intrusion of right upper lateral incisor and an anterior openbite with posterior gagging of molars. (Fig. 3). In the anterior mandible we could appreciate step deformity and missing left central incisor. A panoramic radiograph revealed significant radiolucent line superiorly interdental from tooth 32 and 41 extending inferiorly till the lower border of mandible in the anterior symphysis region (Fig.4) Posteroanterior radiographs of the skull obtained which showed supero-lateral dislocation of the condyles bilaterally (Fig.4). CBCT reveal sagittal fracture of both the condylar heads and locked medial to zygomatic arch and also lingual splaying of the symphysis fracture was seen. (Fig-5)

On systemic examination it was found severe tenderness and restricted forearm movement for which the radiographs revealed bilateral radial fracture.

Patient was finally diagnosed as compound symphysis fracture of the mandible and bilateral lateral dislocation of the condyles of the mandible. Intermaxillary fixation was done with archbars to guide the occlusion followed by open reduction and internal fixation under general anaesthesia. The fractured site was exposed from the existing laceration and reduced to achieve satisfactory occlusion and fixed with overcontoured 2mm 6-hole with gap plate at the compression zone inferiorly and 2mm 4 hole with gap plate at the tension zone superiorly according to Champy's principle. Fixation was followed by placing headless compression Herbert screw (Fig.6) to prevent the lingual splaying of the mandible and to further support the fractured segments also mandible was

manipulated in downward, backward, upward maneuver to reduce it in anatomical position in the glenoid fossa. (Fig.6) Closure was done with 3-0 vicryl sutures followed by orthopaedic treatment of fractured forearm bone bilaterally.

The immediate post operative follow up shows open bite on the right side and also reduced condylar heads with mild discrepancy in the occlusion on right side. (Fig.7)

Maxillomandibular fixation (MMF) was done with traction elastics and a rubber cork placed on right side of occlusion, guiding occlusion in class II position post operatively for 3 weeks, following which rigorous physiotherapy was started. (Fig-8)

At 3 weeks post-treatment, the patient's occlusion was satisfactory (Fig. 9). At the 4-week follow-up, the patient's mouth opening was 35 mm, with no deviation and hindrance during mouth opening. Patient is now planned for rehabilitation of the missing anterior tooth in the upper and lower arch with fixed prosthesis.

Discussion

PubMed based database was searched to identify all relevant case reports published from 1969 to 2016. Key words used are: intact condyle; superolateral dislocation; trauma; temporomandibular joint; unusual dislocation. A total of 17 publications documenting 28 cases of superolateral dislocation of the intact condyle were found . Among these, only two cases had presented with dislocation without any associated facial fracture.^{3,4} Allen and Young proposed a classification for dislocation of the intact mandibular condyle.² However this classification has been used inappropriately in cases with an associated fracture of the condyle, such as a sagittal split, where the lateral stump becomes lodged lateral to the zygomatic arch. For dislocation of the intact condyle, the authors propose that three terms be used judiciously: 'superolateral dislocation', in which the condyle is locked

superiorly and lateral to the zygomatic arch; 'superior dislocation', in which the condyle fractures the glenoid fossa and communicates with the middle cranial fossa; and 'anterosuperior dislocation', in which the condyle is displaced anterosuperiorly but medial to the zygomatic arch. The reason for excluding superolateral dislocation with condyle fracture from the present review is that the management of such dislocations differs from that of the intact condyle and may require internal fixation of the condyle and/or prolonged MMF in certain cases. Allen and Young classified superolateral dislocation of the intact condyle into two types: type I, lateral subluxation; and type II, complete dislocation, in which the condyle is forced laterally and then superiorly to enter the temporal fossa.² Satoh et al. further classified type II into three subtypes, namely IIA, in which the condyle is not hooked above the zygomatic arch; IIB, in which the condyle is hooked above the zygomatic arch; and IIC, in which the condyle is lodged within the zygomatic arch which is fractured.⁶ With this classification, the case presented herein would be classified as IIC. In view of reported cases of SDIMC without associated fracture of the mandible, Tauro et al. suggested a modification to the existing classification, in which type II is complete dislocation with an associated fracture of the anterior mandible and type III is complete dislocation without an associated fracture of the anterior mandible.⁶ As per this classification, the case presented herein falls into type II. The female to male prevalence ratio was found to be 1:6, which clearly shows a male predominance. The most common aetiology was road traffic accidents (85.7%), followed by fall (14.3%). Eleven of the 28 cases of SDIMC identified were associated with bilateral superolateral dislocation with an anterior mandible fracture. Of all the SDIMC cases documented in the

literature, four had no associated anterior mandible fracture.

Li et al. suggested that the mandible rotates around a vertical axis for such an unusual dislocation to occur.⁷ Tauro et al. suggested that more than one impact is necessary for superolateral dislocation to occur, as the first impact would fracture the anterior mandible and the subsequent impact would force the condyle out of the glenoid fossa superolaterally.⁶ The present authors believe that four factors determine the type of dislocation: the anatomy of the condylar head, capsule of the temporomandibular joint, pterygoid and masseter muscles, and elasticity of the anterior mandible. In a partially open mouth position, the pterygomasseteric sling will provide a minimal splinting effect, which facilitates lateral dislocation of the condyle. This possibly explains the mechanism in the case presented herein, as the patient's pterygoid and masseter muscles would have been in a relaxed position during the episode of transient loss of consciousness. The anterior mandible has to flex considerably for such a dislocation to occur associated with anterior mandibular fracture. All four reported cases of SDIMC with-out mandible fracture were in the younger age group.

The following factors may be useful to predict the difficulty of closed reduction: (1) The delay before definitive treatment. If the delay is more than 2 weeks, a satisfactory result with closed reduction is less likely. (2) The type of dislocation. Cases in which the condyle is lodged within the zygomatic arch (type IIC) or the condyle is hooked above the zygomatic arch (type IIB) are more likely to require open reduction than the other types (type I and type IIA). (3) The presence of an associated mandibular fracture. An anterior mandible fracture will facilitate closed reduction by manipulation. (4) The age of the patient. The case presented here was that of a middle

aged patient with associated anterior mandibular fracture. However the dislocation was type IIC and the patient received early closed condylar treatment.

Post-operative MMF is necessary irrespective of the type of reduction method used. The duration of MMF will vary depending on the delay in treatment and the presence of associated fractures of the mandible. Amongst those authors who specified the duration of MMF, this varied from 1 week to 5 weeks. In the case presented here, heavy elastics were applied for 3 weeks, and this was followed by physiotherapy. The prognosis of treatment depends upon regular follow-up and rigorous physiotherapy exercises in the post MMF period.¹ Early diagnosis and treatment with a successful reduction will usually provide adequate mouth opening, as well as lateral excursion. However slight discrepancy still persisted in the occlusion due to muscle pull with anterior open bite. Worthington⁸ described the diagnostic features of such dislocations as follows: malocclusion persisting after jaw fracture was reduced, persistence of an open bite, persistent restriction of mandibular movements, an apparent loss of ramus fragment and facial asymmetry.

Yoshii et al⁹ advised that the clinician should consider an unusual condyle dislocation whenever the signs, symptoms, and clinical course were atypical to a common mandibular fracture. We suggest that in such unusual cases it is always better to advise CT scans and in particular 3D CT, to avoid delay in diagnosis and treatment, since it clearly demonstrates the type and extent of dislocations and any associated mandibular fractures, if present. In our case, the 3D CT revealed fractured and dislocated bilateral condyles over the lateral surface of zygomatic arch along with the mid-symphysis fracture of mandible.

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Legend Figure



Fig. 1: Extraoral profile left and right lateral view

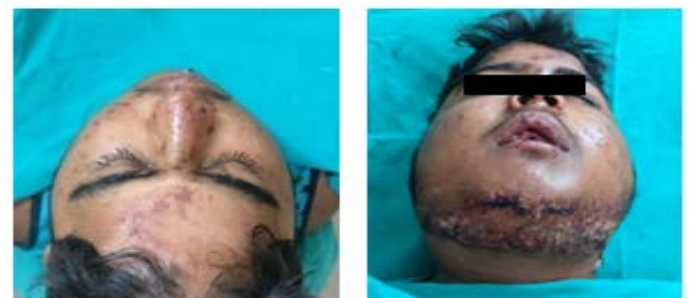


Fig. 2: Extraoral Birds and Worms eye view



Fig. 3: Intraoral occlusion view

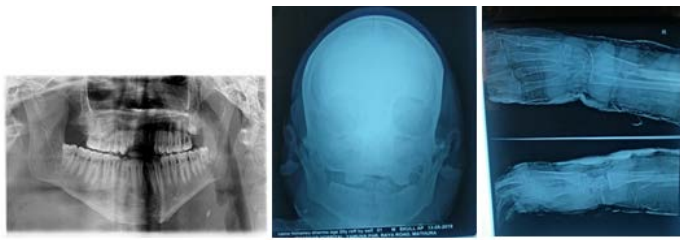


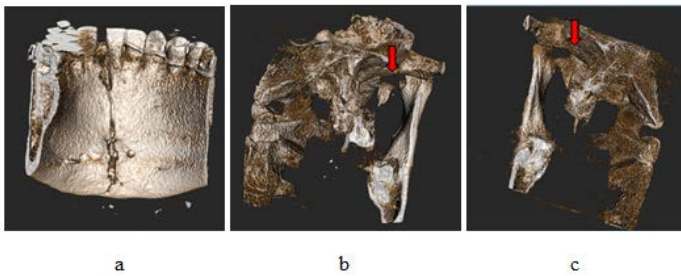
Fig. 4: Orthopantomogram and PA-Skull view, hand-AP view



a-1 week post-op

b- 2 week post-op

Fig.8: a, b: Post operative occlusion with guiding elastics)



a

b

c

Fig. 5: a- 3-D Coronal section of mandible showing lingual splaying. b,c- 3-D image showing sagittally fractured condylar head.



Fig.6: Intraoperative pictures showing reduction of the mandible and internal fixation of the symphysis with mini plates and headless compression screw.

The immediate post-operative follow up shows open bite on the right side and also reduced condylar heads with mild discrepancy in the occlusion on right side. (Fig.7)

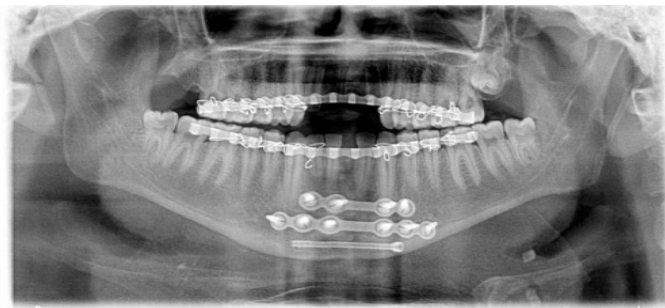


Fig.7: Post-operative Orthopantomogram

Fig.9: 4th week Post – Operative Occlusion