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Superolateral Dislocation of Intact Mandibular Condyle: A Rare Case Series

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Abstract:-
Introduction: In mandibular fractures, the most common dislocations of mandibular condyle are anterior and anteromedial dislocations. Condylar head dislocations are less common in three directions: lateral, medial, and posterior as comparedto superolaterally dislocated condyle which is rarely reported. Patients and Method: We describe four patients with superolaterally dislocated intact mandibular condylein Mahatma Gandhi Hospital (MGH), Jaipur between 2013 to 2021 due to road traffic accidents & fall from height and their treatment modalities. Results: Dislocation towards lateral and superior side of intact condyle is frequently avoided, despite the fact that it needs complete physical and radiographic examinations as well as timely identification and management are extremely important because dislocation for a long time might result in difficult reduction. For superior-lateral condylar dislocations, manual reduction is the first therapeutic option, however in delayed instances, open reduction is the best alternative. Conclusion: This study demonstrates that although superolateral displacement of intact mandibular condyle is a rare condition but the early diagnosis and treatment of SDMC is necessary.

Keyword:- *Superolateral dislocation, Lateral dislocation, Mandibular condyle, Mandibular fracture.*

I. INTRODUCTION

Fracture dislocation is a common injury of the mandibular condyle being typically caused by indirect force and often associated with fractures elsewhere in the mandible. Dislocation of the condyle in these circumstances is usually in medial or anterior direction (Bradley1985) but may occasionally occur in lateral direction (Worthington,1982).[1] Dislocation of the mandibular condyle is clinically defined as "when the condylar head is displaced out of the glenoid fossa but still remains within the capsule of the joint."[2] WhenTMJ is subjected to large-amplitude movements,or suffers an injury, dislocation occurs where the condyle comes out the glenoidfossa due to movement beyond the normal range of the joint.[3]Laterally displaced intact mandibular condyle was first discovered by Robert in 1849 which is an infrequent complication to mandibular injury.[4] Less cases of superolaterally dislocated intact mandibular condyle have been noted.[5]

It has been classified by Allen and Young: type I (lateral subluxation), in which the condyle is laterally displaced out of the fossa, and type II (complete dislocation), in which the condyle has been laterally dislocated as well as superiorly entering in the temporal fossa. Satoh et al. further classified type II dislocation by subdividing it into three categories: type IIA, in which the condyle is not hooked abovethe zygomatic arch; type IIB, in which the condyle is hookedabove the zygomatic arch; and type IIC, in which the condyle is lodged inside the zygomatic arch, which is fractured[6].

This study presents 4 patients diagnosed with superolaterally dislocated intact mandibular condyle by Road Traffic Accidents (RTA)& fall from height and their detailed clinical history, diagnosis and treatment modalities.

II. PATIENTS & METHODS

A. Patients

In this study we have included patients who reported to Mahatma Gandhi Dental College & Hospital with SDMC from year 2013 to 2021. These patients received treatment by department of OMFS. Post complete clinical examination, diagnosis and treatment was planned and written informed consent were taken from all the patients.

B. Surgical treatment strategy

All patients were treated under general anesthesia. Prior to surgical treatment all the routine Investigations haemograms were carried out. The patients were operated by single operator. ORIF under General Anesthesia was done for all the 4 patients.

C. *Ethical Clearance/Patient Consent*

This study was approval was obtained by the Ethical Committee of the MGH. After inclusion criteria in each patient case Performa was filled to collect necessary information and patients were informed about the study and necessary consent was taken from the concerned personnel.

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III. RESULTS

A. Case 1:

A 40 year male patient reported to the casualty of MGH due to RTA(slip from bike). Patient was hit on the road directly over the chin. Patient was non-helmeted. On examination, laceration was present over chin and philtrum region which were sutured. Patient was unable to open mouth, pain and tenderness was present bilaterally over condyle region. Intraorally left mandibular fracture with deranged occlusion was seen with bilateral posterior gagging and cross bite. 3DCT Face revealed bilateral superolaterally dislocated intact mandibular condyle (left- type1 and right- type 2B). Patient was taken under GA and Modified Alkayat Bramley incision was given bilaterally to expose mandibular condyle. Left condyle was reduced and fixed into anatomical position using L- plate and screws, whereas the right condyle was reduced using manual reduction using strong traction wires in right mandibular ramus with the help of stab incision, reduction to anatomical position was done, fixation was done using T-plate and screws. Left parasymphysis fracture was exposed through existing chin laceration, reduced and fixed wih miniplates and screw. Occlusion was regained and jaws were kept under IMF for 4 weeks. (Fig. 1a, b)

Fig 1a: Preoperative Extraoral photograph and 3D CT Face

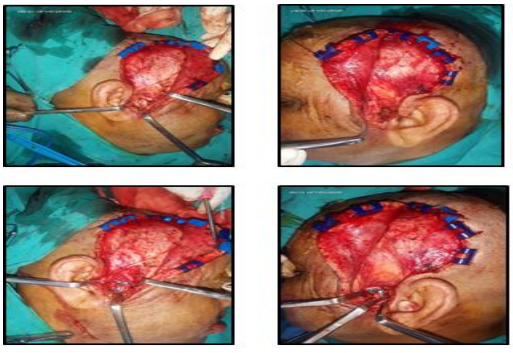

Fig. 1b: Intraoperative photographs

B. Case 2:

A 35 year old male patient came to MGH, with a historyof RTA (collision with trailer of tractor). Negative finding for LOC and presence of ear and nasal bleed was reported. On examination pain and swelling was present over right preauricular region along withintraoral bleeding. On extraoral palpation fracture was present over fronto-zygomatic region, bilaterally infraorbital rim, zygomatic arch, and fronto-nasal region. On intraoral examination step deformity was present at the symphyseal region of mandible andtenderness overbuttress region bilaterally. Toreduce the fractured mandible and to minimize bleedingfrom the fracture site bridal wiring was done.. The three dimensional CT scan revealed Panfacialfracture and right superolateral dislocation of intact condyle. Patient was planned for treatment under general anesthesia after the routine investigations. Maxillo-mandibular fixation was done and fracture site was exposed using extraoral incision over mandibular symphys is region and fixation was done. The hemicoronalincision was given to approach zygomatic arch and right mandibular condyle. Sagittal fracture of articular eminence and superolaterally dislocated right mandibular condyle was fixed using inverted L-shaped plate. Transconjunctival incision was given to expose orbital floor and infraorbital rim and were reduced and fixed. Fractured buttress fragments and were reduced using vestibular incision. Closure done in layers. (Fig. 2a, b)

Fig 2a: Extraoral photograph and 3D CT Face

Fig 2b: Intraoperative photograph

C. Case 3:

A male patient aged 28 yrs came to MGH with a history of RTA by a head on collision of bike with a JCB. No positive history of loss of consciousness, ear or nose bleed, vomiting or seizures. On examination laceration was present over chin region. Swelling was present over anterior mandible and left preauricular region. Mandible was fractured anteriorly with difficulty in mouth opening and deranged occlusion along with step deformity. On palpation pain and tenderness was present on left condyle. 3DCT Face revealed Superolaterally Dislocated left condylar head to zygomatic arch and symphysis fracture. Patient was planned for treatment under GA after all necessary investigations. A left hemicoronal approach was used to expose the affected

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site(left). A stab incision was given, condyle was reduced using strong traction force by drilling a hole in left mandibular angle region. Reduction and fixation of mandibular condyle was done to its anatomical position using a T- plate. Symphys is fracture was reduced and fixed using two mini plates and screws through existing chin laceration. Occlusion was attained. Closure was done and jaws were kept in IMF for 4 weeks. (Fig. 3a, b)

Fig 3a: Preoperative Extraoral photograph and 3D CT Face

Fig 3b: Intraoperative photographs

D. Case 4:

A 42 years old male patient reported to emergency of Mahatma Gandhi Hospital with a history of fall from height. On examination pain and restricted mouth opening with intraoral bleeding, swelling and presence of laceration over the chin region with gross facial asymmetry and left lateral deflection of the mandible was observed. On palpation slight preauricular depression and condyles were palpated above the zygomatic arch. Intraorally anterior open bite with bilateral posterior gagging along with unilateral cross bite on left side was observed. Three dimensional CT scan revealed confirmatory diagnosis of Right parasymphysis fracture and superolateral dislocation of intact condyles. Patient was planned for treatment under General Anaesthesia via Fiberoptic guided Nasotracheal Intubation. Bimanual reduction of dislocated condyles by applying pressure resulted into reduction of right side of the condyle into its normal anatomic position where as left dislocated condyle was reduced manually and Intermaxillary fixation (IMF) was done by applying bigonial pressure to regain occlusion on both the sides with the help of IMF screws. On release of IMF intraoperatively; mandibular mouth opening and movements was evaluated which was leading to repeated slippage of left mandibular condyle laterally and superiorly. Henceforth decision was taken for open reduction on left side Temporomandibular joint for the repair of damaged lateral capsule. Laxity of joint was increased due to tearing of lateral capsule. Alkayat and Bramley Modified Preauricular approach to the TMJ was executed to expose the lateral capsule, temporal fascia, zygomatic root of temporal bone without damaging facial nerve. An inferiorly based split thickness pedicled flap of temporal is myofascial elevated and was sutured to anterolateral wall of the capsule as an anchoring procedure once the condyle is reduced back into the glenoid fossa on IMF. (Fig. 4a, b)

Fig 4a: Preoperative Extraoral photograph and 3D CT Face

Fig 4b: Intraoperative photograph

IV. DISCUSSION

SDMC is a rarely diagnosed and usually seen in combinationwith symphysis, and zygomatico-maxillary complex fractures.[7]

Sagittal fracture of the condyle or mandible fractures usually occur with superolateral dislocations of the condyle.[3]Lateral dislocation of the mandibular condyle can be bilateral or unilateral. The amount and direction of applied force, the position of jaw during injury, and anatomic features of the joint need to be favorable.[8] Usually when history is recorded there isan associated fracture in the symphysis or body region, (contralateral side). Superolateral dislocation can occur only if the condyle is pushed laterally and superiorly. In the process of dislocation,the condyle crosses over the root of the zygomatic arch.[9]Superolateral dislocation is difficult because the movement of mandibular

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condyle is limited by the articular capsule, the temporomandibular ligament, the articular disc, the lateral pterygoid muscle and other structures .[3]

Worthington stated that "A superiorly displaced condyle is accompanied with following findings—a malocclusion persisting after other jaw fractures which have been reduced, persistent restriction of mandibular movements, persistent open bite, an apparent loss of ramus height with elevation of the ramus fragment, or facial asymmetry".[7]

The first treatment option for superolateral condylar dislocations is manual reduction; however in later diagnosed cases, ORIF is the choice of treatment.[10]Early reduction is advisable for this rare condition of lateral dislocation. However, delay in the reduction induces fibrosis of the glenoid fossa, resulting in imperfect or unsuccessful reduction. Presence of the fibrous tissue may make closed reduction impossible. At that time, open reduction/radical surgery becomes essential. In case unsuccessful or imperfect reduction induces fibro-osseous ankylosis of the joint, such condition necessitates condylectomy with or without arthroplasty.[2]"The following factors may be useful to predict the difficulty of closed reduction:

- If the delay in definitive treatment is more than 2 weeks, a satisfactory result with closed reduction is less likely.
- Type IIC and type IIB are more likely to require open reduction than the other types (type I and type IIA).
- The presence of an associated mandibular fracture."[11]

The first-choice treatment for patients with superolateral dislocation is to reduce and fix the fractures within the first weekafter injury. Within the first week after traumafibrous tissue adhesion takes place at the ends of the fracture.[9] Medial pulling of the pterygoid muscles during impact on the face may partly contribute to the rarity of condylar lateral displacement.[3] Under general anesthesia the mandibular angle was pushed downward to reduce the dislocated condyle. Load-bearing internal fixation for other mandibular fracture sites was used.[12]

The purpose of this study was to investigate the clinical manifestations and diagnosis of SDMC and to discuss treatment for the same.

V. CONCLUSION

To conclude, although superolateral dislocation of intact mandibular condyle is a rare condition but the early diagnosis and reduction is desirable. As soon as patient is diagnosed with SDMC, reduction should be done immediately. The prognosis in long standing cases is not favorable because difficulty index to reduce the condyle becomes more, as delayed cases induces fibrosis of the glenoid fossa, which results in unsuccessful reduction. The first line of treatment is closed reduction for a condyle dislocation. Imperfect reduction can cause fibro-osseous ankylos is of the joint, which requires additional surgical procedures like condylectomy with or without arthroplasty.

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