

Superolateral dislocation of the intact mandibular condyle: our experience and review of the literature

Case Report

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ABSTRACT

Anteromedial fracture dislocations of the mandibular condyle are frequently encountered in clinical practice; however, superolateral dislocations of an intact condyle represent a considerably rare case. Remarkably, the occurrence of such dislocations unaccompanied by any associated fractures is even rarer. In this study, we present a case of superolateral dislocation of an intact mandible in a 43-year-old male patient following a road-traffic accident. Manual reduction successfully repositioned the displaced intact mandibular condyle, resulting in normal mouth opening after the release of intermaxillary fixation (IMF). Favorable occlusion was confirmed one month postoperatively.

Additionally, this paper meticulously examines previously documented case reports to shed light on the causative mechanisms, dynamic characteristics, diagnostic features, and optimal management strategies pertaining to such unusual dislocations, incorporating a comprehensive review of the existing literature. By addressing this infrequent condition, our study aims to ascertain the fact that superolateral dislocation of the mandibular condyle can occur without any associated fractures.

Keywords : Superolateral dislocation, intact mandible, manual reduction

Received: 27 July 2023 , **Accepted:** 7 August 2023.

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ISSN: 2090-097X, July 2023, Vol. 14, No. 3

INTRODUCTION

Condylar fractures are unique among maxillofacial trauma because they significantly impair mandibular function. Biomechanically, the condylar neck is the weakest part and is more prone to fracture from impact on the chin. Nevertheless, in few cases, the impact can cause the condyle to move out of the glenoid, but within the joint capsule, either unilaterally or bilaterally, without fracturing it defining a dislocation of mandibular condyle.

In this paper, we present an unusual case of superolateral dislocation of the intact mandibular condyle without associated fractures. This case report attempts to add our case to the preexisting numerical data along with the review of literature to understand the dynamics of etiology, pattern, diagnostic features and current methods of treatment of such dislocations.

CASE REPORT:

A 43-year-old referred to the maxillofacial emergency room with trismus, malocclusion, lateral mandibular deviation, and jaw pain. The patient was involved in a car accident 24 hours previously. He reported that he

jumped out of his car due to a brake problem, the right side of his face was the first point of impact during the fall, and then his chin crashed into the ground.

A detailed extraoral examination showed facial asymmetry and severe deviation of the mandibular midline toward the left side. The palpation revealed diffuse, bony-hard swelling and tenderness in the left preauricular region, associated with a deep laceration over the chin and lower lip. Intra-oral examination revealed a restricted mouth opening of 5mm, and a lateral crossbite (**Figure 1**).



Special investigations included a continuous axial computed tomography (CT) and 3-dimensional CT (3D CT) that showed superolateral dislocation of the left condyle overlying the lateral surface of the left zygomatic arch with the coronoid process intruding into the temporal fossa, while the right condyle was intact (**Figure 2**).



Interestingly, there was no fracture in the whole mandible.

The patient was admitted to the operating room the next day. Since the patient main symptom was a severely restricted mandible movement, we decided that manual manipulation would be attempted first under general anesthesia via nasal intubation. Bimanual reduction was successfully carried out by applying outward and downward pressure over the molar region, and the pre-injury occlusion was re-established. The left condyle was returned to its original position. The patient was placed into intermaxillary fixation (IMF) and remained in IMF for 2 weeks with a semisolid diet during this period (**Figure 3**).



Post operative 3D CT verified the position of the dislocated left condyle into the glenoid fossa (**Figure 4**).



The postoperative recovery was uneventful and the patient was discharged from the hospital on the 3th postoperative day. After releasing the IMF, the mouth opening was about 34 mm, the occlusion was good and stable. The patient was placed on jaw physiotherapy postoperatively, and was instructed to open his mouth to the maximum extent possible and move anteriorly/laterally. No reduction in mouth opening or signs of temporomandibular joint disorder or any other complication were observed at 6 months of recall visit.

DISCUSSION:

Depending on the direction of mandibular condyle dislocation, it is classified as anterior, posterior, lateral or superior^[1]. Of these, anterior dislocation is most commonly encountered due to lateral pulling of the pterygoid muscle. In contrast, lateral and superior dislocations of the condyle are much less common, as attachments of various structures such as the temporomandibular joint ligament, joint capsule, joint disc, and lateral pterygoid muscle restrict condyle movement. Dislocation of condyle was classified by Allen^[2] as type I (lateral subluxation) and type II (complete dislocation) in which the condyle is forced laterally and superiorly to enter the temporal fossa. In the latter situation, the medial edge of the ovoid-shaped head of the condyle is engaged above the posterior root of the zygomatic arch. Satoh et al.^[3] further classified type II into 3 subtypes i.e. type IIA, in which the condyle is not hooked above the zygomatic arch; type IIB, in which the condyle is hooked above the zygomatic arch; and type IIC, in which the condyle is lodged inside the zygomatic arch, which is fractured. Tauro et al added a type III dislocation as a complete dislocation without associated fracture of anterior mandible^[4].

Lateral dislocation of the mandibular condyle is a condition in which the condyle lies outside the articular eminence or glenoid fossa and is unable to return to a closed position^[5]. Superolateral dislocation of the intact mandibular condyle is a very rare condition. It was first reported by Robert in 1849 who described a reduction technique for this type of dislocation which consisted of strong outward pressure on the ramus with inferior traction and medial pressure on the condylar head^[3]. Later, Allen^[2] observed associated fracture of anterior mandible, near the symphysis with superolateral dislocation of condyle.

D.P. Bhutia et al^[6] collected 58 cases of superolateral dislocation of mandibular condyle (SDMC) from the reported English scientific literature from 1969 to 2015. Among these, 38 (65%) included intact mandibular condyle and the remaining 20 had sagittal split (35%), with or without associated mandibular fractures. The dislocations were mostly unilateral (68%), while remaining (32%) were bilateral. About 70% of the dislocations were associated with pure mandibular fractures, whereas approximately 18% had other associated facial bone fractures. In the remaining 12%, both mandible and midface were intact. Our case study can be consolidated in this last category (**Table 1**).

Table 1. Review of 12 cases documented as superolateral dislocation of an intact mandibular condyle with no associated fractures.

Year	Author	Involved side	Type of dislocation	Reduction time (days)	Reduction method	Follow up
1978	Brusati (16)	U	II	1	Closed	Facial palsy
		U	II	12	Opened	Facial palsy
1988	Devita (11)	B	II	NA	Closed	Coronoidectomy for limited MO
2007	Bu (9)	U	II	5	Closed	Normal occlusion
2010	Papadopoulos (18)	B	II	NA	Opened	Normal occlusion with lateral excursions
2010	Hegde (19)	U	II	5	Opened	NA
2011	Prabhakar (20)	B	II	45	Opened	Normal occlusion
2013	Chaithanya (21)	U	II	6	Opened	Normal occlusion
2013	Li (22)	U	II	NA	Closed	Normal occlusion
2015	Mishra (23)	U	II	NA	Opened	Normal occlusion
2017	Srinath (24)	U	II	4	Closed	Normal occlusion
2020	Kokane (25)	U	II	NA	Closed	Normal occlusion

NA- Not Available, U- Unilateral, B- Bilateral, MO- mouth opening

Complete understanding of the dynamics of dislocation was the aim of Li and al^[7] study which was conducted by simulating the dislocation on a dried skull. They concluded that the factors considered essential to such an injury occurring are the size and the direction of applied force, the position of the jaw during impact (the mouth may be in a wide-open position), and the anatomic features of the joint (joint capsule and pterygoid muscles may be flabby).

Rattan^[8] stressed that, for the cases with lateral dislocation of the mandibular condyle, there was always a history of trauma to the side of the chin and there is an associated fracture in the symphyseal or body region, usually on the contralateral side. The associated mandibular fracture facilitates the rotation and movement of the ramus, which will contribute to the superolateral dislocation of the mandibular condyle. For the case reported here, it is relatively rare that the condyle was forced laterally and superiorly but the symphyseal, body region, or condyle neck was intact.

Therefore, it can be concluded that diaphyseal or body fractures of the mandible are not a prerequisite for lateral displacement^[7, 9, 10].

Worthington^[11] described the diagnostic features of superolateral dislocations as follows: persistent open bite, persistent limitation of mandibular movement, persistent malocclusion after jaw fracture, apparent loss of ramus height, and facial asymmetry. For Yoshii and al^[12], clinicians need to consider abnormal condylar dislocation whenever the signs, symptoms, and clinical course are not characteristic of common mandibular fractures. In such unusual cases, it is always advisable to perform a CT scan, especially 3D CT, to avoid delays in diagnosis and treatment. 3D CT scans can clearly demonstrate the dislocated condyle, dislocation type, and whether or not there is a fracture. It is very effective and useful in the diagnosis of this type of dislocation especially when there is failure of reduction manually.

The goal of superolateral dislocation treatment is to reposition the condyle into its normal physiological position, and closed reduction remains the treatment of choice since it is the easiest, least traumatic, and safest if done early^[9, 11, 12]. To overcome the spasm of the lateral pterygoid muscle, further medicine such as Diazepam for sedation and intraarticular injection of local anesthetic may be required. General anesthesia and muscle relaxants may also be employed.

Several techniques for reducing superolaterally dislocated condyles have been described in the literature, including Finck's technique, in which traction wires are passed through holes drilled in the mandibular angle region to facilitate reduction of the dislocated condyle into the glenoid fossa^[1, 13].

The other way of reduction is to use a bone hook implanted at the sigmoid notch by a stab incision at the same level, followed by outward traction to enable reduction of the condyle into the glenoid fossa^[14]. Temiz et al.^[15] recently presented the Muselet approach as a viable intraoral way of reducing laterally displaced condyle. It entails passing a 0.8 mm thick wire through a hole drilled in the rami and twisting the wire on itself while drawing it in the inferior direction. This procedure pulls the ramus inferiorly and medially, resulting in joint reduction, which can be palpated^[15].

Open reduction is to be reserved for those cases not amenable to closed reduction. Direct exposure of dislocated condyle through a preauricular approach is useful for difficult cases and more so in long standing ones (fibro-osseous ankylosis) where condylectomy with or without arthroplasty would be necessary^[13, 16].

A maximum inter incisal mouth opening of 30 mm and a satisfactory occlusal relationship 5 months after surgery are considered good signs of successful treatment of condylar dislocation^[12].

Many authors have recommended that postoperative intermaxillary fixation for at least 2 weeks is essential to assist the healing of injured temporomandibular joint ligaments, followed by intensive physiotherapy to help restore range of motion and improve strength in the jaw muscles^[7, 17].

CONCLUSION:

In summary, superolateral dislocation of the intact condyle is frequently overlooked despite the fact that it necessitates rigorous physical and radiographic exams. Because prolonged dislocation might make reduction more difficult, resulting in unsatisfactory results, early diagnosis and intervention are actively encouraged.

The majority of published cases in the literature concluded that superolateral dislocation is usually linked with fracture of the body or symphysis on the contralateral side, but in our case the patient exhibited superolateral dislocation without any associated fracture. As a result of our observation, we infer that condylar dislocation can occur with or without body or symphysis fracture.

CONFLICT OF INTEREST

There are no conflicts of interest.

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