Superolateral Dislocation of the Mandibular Condyle: A Series of Seven Cases

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Abstract

Introduction Anterior and anteromedial dislocations of the mandibular condyle are seen frequently in mandibular fractures. Less frequent are dislocations of the condylar head in the lateral, medial and posterior direction whereas superior dislocation into the middle cranial fossa is rare. We report a series of seven cases encountered over the years, which, incidentally, is the largest case series reported till date with lateral and superolateral dislocation of the condyle after a traumatic injury.

Materials and method In all cases but one, the condyle was reduced by manual manipulation with the patient in general anaesthesia. In all cases but one there was simultaneous fracture in the mandibular symphyseal region. The associated fractures were reduced and fixed with bone plates and screws.

Results Patients were generally free from any long term complications of injury or surgery except for facial nerve paresis of a transient nature in one case.

Conclusion To our knowledge, this clinical series presents the first reported case of superolateral dislocation

which required open reduction. The etiology and mechanism of dislocation has been discussed along with a brief review of the literature.

Keywords Superolateral dislocation · Lateral dislocation · Mandibular condyle · Mid-symphyseal fracture

Introduction

Dislocation of a joint occurs when the articular surfaces are no longer in contact with one another. Certain patterns of temporomandibular joint dislocation are common and easily diagnosed such as anterior and anteromedial dislocations with or without associated mandibular fractures. Less frequent are dislocations of the condylar head in the lateral, medial and posterior directions whereas superior dislocation into the middle cranial fossa is rare [1].

Lateral dislocation of the intact mandibular condyle was first reported in 1849 by Robert and is a rare complication associated with traumatic injury to the mandible [2]. In 1969, Allen and Young reported five cases of lateral displacement of the condyle with a system to classify these injuries [3]. They subdivided such dislocations into 2 types: type I (lateral subluxation), in which the condyle has been laterally dislocated out of the fossa, and type II (complete dislocation), in which the condyle has passed laterally and then superiorly to enter the temporal fossa. Satoh et al. [4] reported 1 case and further classified type II dislocation into 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.

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We report a series of cases encountered over the years that will serve to add to the literature

Patients and Method

Case 1

A 33 year old construction worker was referred to our department following a fall the previous day. He was trying to lift a metal frame with ropes and pulleys. The frame which was resting on pillars started to slip. The patient ran but slipped, stumbled and hit his chin over a tree stump just as the metal frame hit the right side of his face. There was loss of consciousness for about 30 min and a laceration on the right side of the chin. He received primary treatment at a nearby hospital and was discharged after observation. On examination, there was a sutured laceration on the right side of the chin. There was a hard and tender swelling in the left preauricular region. The mandible was fractured at the symphysis region and was pushed backwards such that the patient was unable to open it. Condylar movements were very limited and painful and could not be elicited on either side. Occlusion was disturbed. Radiographic examination revealed a superolateral dislocation of the intact condyle (type IIB) on the left side, right condylar fracture with anteromedial displacement and a right para-symphyseal fracture (Fig. 1). Reduction of left condyle was done under deep sedation by lateral and inferior movement of left ramus. Transosseous wiring and circum mandibular wiring with an

acrylic splint was done at the right parasymphysis through the facial laceration and the jaws were placed in intermaxillary fixation (IMF) for 4 weeks (Fig. 2).

Case 2

A 35 year old truck driver came to us with a history of trauma due to head-on collision with another truck. His jaw

Fig. 2 Case 1—reduced *left* condyle. Transosseous wiring and circum mandibular wiring at the *right* parasymphysis

Fig. 1 Case 1—superolateral dislocation of the intact condyle (type IIB) on the *left* side, *right* condylar fracture with anteromedial displacement and a *right* parasymphysis fracture

Fig. 3 Case 2—bilateral superolateral dislocation of the condyles (type I) with comminuted *left* parasymphysis fracture

had struck the steering wheel of his own truck in the accident. He had swelling in the preauricular region bilaterally, restriction of mouth opening and limitation of lateral jaw movements, bilateral molar gagging with anterior open bite and bilateral crossbite due to flared mandibular arch. Radiographs showed bilateral superolateral dislocation of the condyles (type I) with comminuted left parasymphysis fracture (Fig. 3). Manual manipulation and reduction of the condyles was done under general anaesthesia (GA) and miniplates were used for parasymphysis fracture fixation.

Fig. 4 Case 3—chin deviation with cross bite on the *right side*

Fig. 5 Case 3—type IIB condylar dislocation on *right side* without any associated mandibular fracture

Case 3

A 28 year old female patient was thrown off of a motorcycle while riding pillion without helmet, after her husband braked suddenly. Her mouth was open when the left side of her face struck the road. She had a deviated chin to the right side, restriction of mouth opening and limitation of jaw movements with cross bite on the right side (Fig. 4). Superolateral condylar dislocation of the intact condyle (type IIB) was seen on the right side (Fig. 5). There were no associated facial or mandibular fractures. Open reduction of the right condyle was done under GA by

Fig. 6 Case 3—open reduction of the *right* condyle was done under general anaesthesia (GA) by preauricular approach

Fig. 7 Case 3—postoperative photograph showing occlusion after condylar reduction

preauricular approach after an unsuccessful attempt to manually reduce it and occlusion and mouth opening were achieved postoperatively (Figs. 6, 7).

Case 4

A 25 year old male patient fell while riding his bicycle and the left side of his face struck the cemented foothpath. He had lacerations on the bridge of his nose and left malar region with a severely deviated chin to the right and swelling of the right preauricular region with difficulty and pain on mouth opening and jaw movement (Fig. 8) and crossbite on the right side. The radiographs showed type II A dislocation of the right mandibular condyle with left parasymphyseal, nasal and left zygomatic complex. Reduction of the condyle was done by manual manipulation of the mandible with the patient under GA along with open reduction and fixation of left parasymphysis and left zygomatic complex fracture with miniplates. The nasal bone was reduced by a closed method.

Case 5

A 29 year old female patient reported to us with a history of fall while riding a scooter over a muddy road at a right turn. On examination she had swelling and lacerations of the upper lip and cheek on the left side, epistaxis, mucosal lacerations in the upper and lower lip, pain on jaw movements, maxillary dentoalveolar fracture with avulsed anterior teeth, right sided crossbite and comminuted fracture of the symphysis. A computed tomographic (CT) scan showed superolateral left condylar dislocation (type IIA)

Fig. 8 Case 4—severely deviated chin to the *right* with hard swelling in the *right* preauricular region with restriction of mouth opening

just lateral to the left articular eminence with sagittal splitting of both the condylar heads (Fig. 9). Closed reduction of the dislocated left condyle was done by manipulation under GA along with open reduction and fixation of symphysis fracture and splinting of maxillary dentoalveolar fracture. The patient was placed in IMF for 4 weeks.

Case 6

A 25 year old male patient reported with a history of road traffic accident (his motorcycle collided with a car) and a chief complaint of inability to open his mouth and disturbed occlusion. He had a swelling in the preauricular region on both sides and the chin along with a degloving

Fig. 9 Case 5—computed tomographic (CT) scan showing superolateral *left* condylar dislocation lateral to the *left* articular eminence

Fig. 10 Case 6—bilateral superolateral condylar dislocation of the type II A variety with bilateral sagittal intracapsular fractures of the condyle and *left* parasymphysis fracture

injury of the anterior mandibular labial mucosa. Mouth opening was 1 cm and joint movements were restricted and painful. He had a left parasymphysal fracture and the left lower jaw fragment was pulled medially. A CT scan revealed bilateral superolateral condylar dislocation of the type II A variety with bilateral sagittal intracapsular fractures of the condyle (Fig. 10). Under GA, reduction of the condyles was performed by manual manipulation and parasymphysis fracture was reduced and fixed with bone plates. The jaws were placed in IMF for 7–10 days.

Case 7

A 30 year old male patient reported with a history of trauma due to road traffic accident the day before and inability to occlude his teeth and fracture of the upper jaw. He had facial swelling and a sutured laceration on his chin,

Fig. 11 Case 7—photograph showing bilateral hard swellings in the preauricular region, laceration on chin and multiple abrasions

Fig. 12 Case 7—bilateral superolateral dislocation of the mandibular condyles hooked over the zygomatic arches

multiple abrasions on his forehead, bridge of his nose, cheeks and neck. On examination, there were bilateral hard swellings in the preauricular region (Fig. 11). Temporomandibular joint movements were restricted in all excursions. The mouth opening was about 1.5 cm with bilateral cross bite and a unilateral Le Fort I fracture of the left maxilla with a median palatal split. The CT scan showed bilateral superolateral dislocation of the mandibular condyles (type IIB) with a mid symphyseal fracture, and unilateral maxillary fracture (Fig. 12). The condyles were reduced in the glenoid fossa under GA by closed manipulation of the mandible and the symphysis fracture reduced and fixed via chin laceration. The maxilla fracture was reduced and splinted with an arch bar.

Discussion

Superolateral dislocation of the mandibular condyle is a rare event and has been reported to be always combined with fractures near the symphysis, sometimes also the condyle and fractures of the malar complex [3, 5]. Six out of seven of our cases had accompanying fractures near the symphyseal regions thereby being consistent with this etiology. Patient no. 3 however, did not have any other fractures of the mandible or midface. Recently, two case reports have been published in which there were unilateral superolateral dislocations of the intact mandibular condyle with no accompanying fracture of the symphysis region; one patient had his condyle lodged in the temporal fossa medial to an intact zygomatic arch [6] and in the other report the condyle was hooked over the zygomatic arch with a sagittally split small condylar fragment and fractures of the zygomatic arch and maxilla which were undisplaced [7]. Two of our patients (no.5 and no.6) also had bilateral sagittally split condyles. To in 1989 reported a case of superolateral dislocation of the condyle where the condyle was concurrently fractured antero-posteriorly [8]. Worthington [1] stated that the clinician's suspicion of a superiorly displaced condyle should be aroused by the following—malocclusion persisting after other jaw fractures have been reduced, persistent open bite, persistent restriction of mandibular movements, an apparent loss of ramus height with elevation of the ramus fragment, or facial asymmetry. With regard to six out of seven of our cases the mechanism of the injury is explained as follows—when the chin is struck forcefully, the direct force causes the symphyseal or parasymphysal fracture. The mandible being a horseshoe shaped bone flares up at the angle region. With continued application of force the displacement and dislocation of the condyle(s) occurs in the lateral direction. In the one case where no symphyseal region fracture was encountered the mechanism of injury

proposed by Li et al. can explain the dislocation—the patient fell off the motorcycle when her husband applied the brakes suddenly. Her mouth was open and the force was applied laterally on the left side of her face which caused rotation of the mandible along a vertical axis resulting in the right condyle being pushed laterally and superiorly until the condylar head came out of the glenoid fossa to be pushed up alongside the skull and the coronoid process became lateral to the zygomatic arch. They postulated that the factors considered essential to such an injury occurring are the size and direction of the applied force, the position of the jaw in a wide open position, and the anatomic feature of the joint (joint capsule and pterygoid muscles may be flabby) [7].

Manual reduction of the dislocated condyles was tried under GA in six patients and deep sedation in one patient. In this patient, mouth opening was not enough, therefore blind intubation was done up to the laryngeal inlet. To achieve reduction, pressure was applied by the thumb at the third molar—ascending ramus region and the proximal segment was mobilised laterally and then inferiorly till it occupied its position in the mandibular fossa. We were successful in achieving reduction of the condyle in the glenoid fossa in six patients. Robert [2] described the method of reduction using outward manual pressure on the ascending ramus from inside the mouth followed by downward traction of the condyle. Ferguson et al. [9] and Kapila and Lata [10] were able to reduce laterally dislocated condyles using strong traction and a wire through the mandibular angle. Open reduction of the dislocated condyles in patient no. 3 was done after manual attempts to reduce it were unfruitful. The preauricular approach was used to expose the dislocated condyle. In all patients satisfactory mouth opening was achieved postoperatively. Facial nerve paresis of temporary duration was seen in patient no. 4 which resolved in about 3 months. Rowe [11] stated that the superolateral dislocation of a mandibular condyle that is split anteroposteriorly is an inadequately recognized cause of ankylosis in both the adult and the older child. Delay in treatment or a missed diagnosis can lead to ankylosis. All patients in our series were on an average operated within a week of the traumatic event.

To conclude, the early diagnosis of superolateral condyle dislocation, rare though it is, and reduction is

desirable. The prognosis in long standing cases is not favourable because it becomes more and more difficult to reduce the condyle. A delay in the reduction induces fibrosis of the glenoid fossa, resulting in imperfect or unsuccessful reduction. Manual/closed reduction is the first choice for a condyle dislocation. Unsuccessful reduction can lead to fibro-osseous ankylosis of the joint, which necessitates further surgical procedures like condylectomy with or without arthroplasty.

Conflict of interest None.

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