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TRAUMATIC SUPEROLATERAL DISLOCATION OF INTACT MANDIBULAR CONDYLE INTO THE TEMPORAL FOSSA: A CASE REPORT.

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ABSTRACT

Temporomandibular joint dislocation occurs when the head of the mandibular condyle is dislodged from its normal position in the glenoid fossa which is located in the squamo-temporal portion of the cranial base. Causes of temporomandibular joint dislocation include trauma, iatrogenic, connective tissue disorder, drug induced or spontaneous. Superolateral dislocation of the condyle is uncommon and it has been first described by Allen and Young where they reported five cases of such dislocation. In this present case the dislocation of the intact mandibular condyle into the temporal fossa was not associated with any mandible or facial fractures, making it unique and difficult to treat. Several techniques have been described in the literature for management of this type of condylar dislocation, but in this case, coronal flap was choosen as surgical access for open reduction.

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ABSTRACT

Temporomandibular joint dislocation occurs when the head of the mandibular condyle is dislodged from its normal position in the glenoid fossa which is located in the squamo-temporal portion of the cranial base. Causes of temporomandibular joint dislocation include trauma, iatrogenic, connective tissue disorder, drug induced or spontaneous. Superolateral dislocation of the condyle is uncommon and it has been first described by Allen and Young where they reported five cases of such dislocation. In this present case the dislocation of the intact mandibular condyle into the temporal fossa was not associated with any mandible or facial fractures, making it unique and difficult to treat. Several techniques have been described in the literature for management of this type of condylar dislocation, but in this case, coronal flap was choosen as surgical access for open reduction.

Keywords: Mandibular Condyle, superolateral dislocation, Temporomandibular joint, case report, open fracture reduction.

INTRODUCTION

Dislocation of the temporomandibular joint (TMJ) is one of the earliest afflictions of the jaw described in the literature and has been explained by Hippocrates in the 5th century.[1] TMJ dislocation can be defined when the head of the mandibular condyle is dislodge from its normal position in the glenoid fossa which is located in the squamo-temporal portion of the cranial base.[2] This type of dislocation represents 3% of all reported dislocated joints in the body.[3] There are multiple causes for its occurrence which can be divided into trauma, iatrogenic, connective tissue disorder, drug induced or spontaneous. If the mandibular condyle displacement is to occur, it may be in one of these directions: anteriorly, anterolaterally, posteriorly, superiorly and laterally.[4] Anterior dislocation is the most common type of TMJ dislocation, while superolaterally occurs very infrequently.[2] We reported here a rare case of superolateral dislocation of mandibular condyle into temporal fossa without any concomitant facial fractures. Most of the previous literature

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reported that superolateral dislocation must be associated with other facial fracture, particularly the symphisis and/or body of the mandible. [4-5]

CASE REPORT

A 24 year old Malay female presented to Emergency Department with inability to close her mouth after she was involved in a motor vehicle accident. She was a back seat passenger when she was thrown forward against the front seat during the accident. There was no history of loss of consciousness, nausea or vomiting.

Physical examination revealed anterior open bite, with interincisal distance of 42mm. There was no mandibular movement, facial swelling, hollowness at the preauricular regions on both sides or laceration on the chin. Manual reduction was attempted but was unsuccesful. Archbar with elastic was placed in view of suspected condylar fracture. A computed tomography scan with 3D reconstruction clearly revealed the left condyle was intact and located medially and superiorly to the zygomatic arch (Figure 1a).

Close manual reduction under general anaesthesia was attempted on the next day but again was unsuccessful . Open reduction was carried out three days later under general anaesthesia. Access was achieved

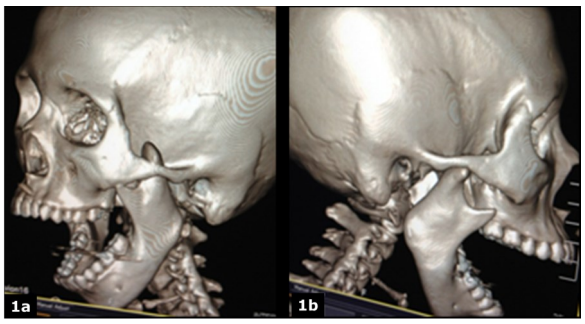

Figure 1: a) Left mandibular condyle dislocated medially and posteriorly, b) Right mandibular condyle dislocated anterior to the articular eminence. Both zygomatic arches were intact. CLICK IMAGE TO ENLARGE.

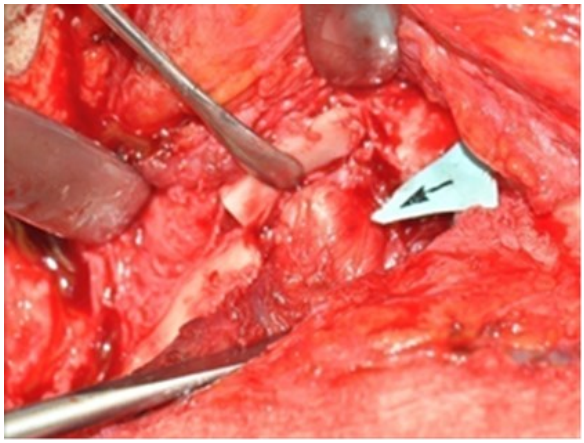

Figure 2: Exposure of the zygomatic arch via a coronal flap surgical access with extension to the left preauricular area. The dislocated mandibular condyle in the left temporal fossa is clearly visualized as indicated by the black arrow. CLICK IMAGE TO ENLARGE.

through a coronal flap that extended to the left preauricular area which exposing the left zygomatic arch. The dislocated mandibular condyle in the left temporal fossa can be clearly visualized through this access (Figure 2). The left zygomatic arch was osteotomized in order to release the trapped condyle. Occlusion was restored and patient was placed on intermaxillary fixation (IMF) for two weeks. Plating was done to the previously osteotomized zygoma.

Recovery postoperatively was uneventful followed by mouth-opening training and monthly follow up for 4 months. She was free from symptoms and her occlusion was intact with maximal interincisal opening of 32cm.

DISCUSSION

Superolateral dislocation of the mandibular condyle occurs very infrequently. It can be classified as type I (lateral subluxation) and type II (complete dislocation). [4] The classification has been modified further by Satoh et al depending on the position of condyle in relation to the zygomatic arch .[5] Later, type III dislocation was suggested by Prabhakar and Singla which can be described as the clinical condition when the condyle has

passed anteriorly and the superiorly to enter the temporal fossa and is lodged between the unfractured zygomatic arch on the lateral side and temporal fossa and its content on the medial side, together with an intact mandible (Figure 3). [3] This classification suits the type of mandibular condyle dislocation presented in our patient.

Majority of superolateral dislocation of the mandibular condyle can be found in patients that had suffered road traffic accidents and often associated with other mandibular (82%) or facial fractures (23%).[5] It is known that fractures of the relatively slender condyle neck serves as a safety mechanism to avoid superior dislocation into the middle cranial fossa or posterior dislocation that leads to disruption of the external auditory meatus.[7]

It was assumed that the dislocation of the mandibular condyle superolaterally into the temporal fossa happened when the jaw received a blow with the mouth wide open, perhaps during fright or while crying out.[7] Under these circumstances the condyle position might be anterior to the articular eminence and a direct blow to the jaw then drive the condyle upwards anterior to the eminence, deep to the zygomatic arch and into the temporal fossa.[8]

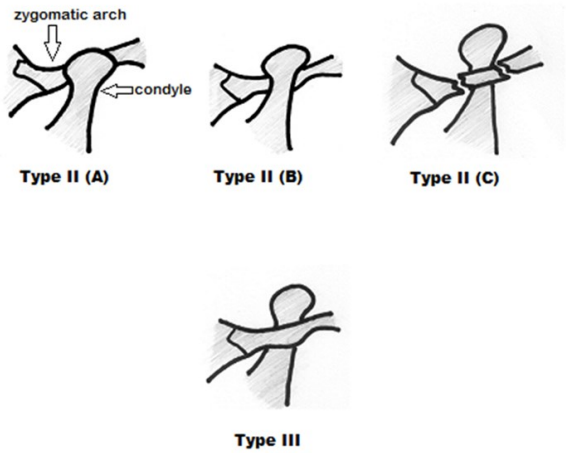

Figure 3: Type II (Satoh[5]) and Typer III (Prabhakar and Singla[3]) classification of complete superolateral disclocation of the mandibular condyle. CLICK IMAGE TO ENLARGE.

Worthington suggested that for this type of dislocation, two obstacle need to be overcome. First, the capsular and ligamentaous attachments to the condyle head must be ruptured and secondly, the transverse dimension of the condyle head exceeds the lateral dimension of the space between zygomatic arch and the medial bony wall of the temporal fossa[7]. In order for the condyle head to pass this obstacle it would necessary for one of three things to happen: 1) the zygomatic arch itself may fracture, thus affording room for the condyle to pass; 2) the condyle head itself may fracture, thus reducing the bulk; 3) the condyle head may rotate about a vertical axis which likely to occur in association of mandibular fracture.

There are several authors who supported this and emphasized that mandible fracture is a prerequisite for lateral dislocation of mandibular condyle to occur.[4, 6, 7] Theoretically, it was explained that the associated mandibular fracture will facilitate the rotation and movement of the ramus, thus contributing to the dislocation of mandibular condyle into the temporal fossa.[14] However, in our case, the dislocation of the mandibular condyle into the temporal fossa was not associated with any facial fracture. There are only a few cases reported to have the same findings with our case, thus suggesting that fracture of mandible is not prerequisite for this type of dislocation to occur. [3,8]

Patients with superolateral dislocations may present with a preauricular swelling, severe restriction of mandibular movements, apparent loss of ramus height with elevation of the ramus fragment, deviation of the mandible to the ipsilateral side and persistent open bite.[7,8,9] An unusual condylar displacement should be considered whenever the signs and symptoms and clinical

course are atypical of common mandibular fractures.[7] Associated facial nerve injury have been reported previously as a rare complications of lateral displacement of intact condyle.[12]

Radiological imaging in antero-posterior, Towne's and occipito-mental views may be helpful in establishing the diagnosis.[4] In our case, computed tomography scan with 3D reconstruction clearly showed the type of mandibular condyle dislocation and thus confirming the diagnosis.

Manual reduction of the dislocated condyle is the first choice treatment. It is by far the simplest, least traumatic and safest of all the alternatives. A dislocation presented after a few days delay, may often be corrected by this method. If time elapses further, closed reduction methods may become more difficult and are usually unsuccessful, at which point open reduction become necessary. Huang et al defined long standing TMJ dislocation as 'an acute dislocation left untreated or inadequately reduced for more than 72 hour.[10] Over time, the dislocation of the condyle causes muscle spasm, fibrotic tissue formation and soft tissue in-growth into the glenoid fossa . All of which will make the reduction more difficult and decreases the change of a successful close manual reduction.

Considerable amount of downward traction may be needed to reposition the condyle when reduction has been delayed. This can be done by several techniques such as traction from below via arch bars and elastic, manual traction using hooks in the sigmoid notch, or traction via wire through the mandibular angle placed extraorally.[7,10] Bu et al has successfully use mouth gag which act as a fulcrum in reducing the superolaterally dislocated condyle under general anaesthesia.[8]

From the previous reports, lateral dislocation has a high incidence of unsatisfactory results and imperfect reduction obtained by closed reduction.[5, 11] Worthington stated that impaction of the condyle beneath the zygomatic arch is unlikely to yield to elastic traction, thus operative measure of the condyle should be emphasized.[7] This can be successfully done by removal of the zygomatic arch and application of direct leverage to release the trapped condyle. Most of the authors have used preauricular approach for surgical exposure, but in our case, the approach was through a coronal flap which extended to the left preauricular area. The coronal or bi-temporal incision is a versatile surgical approach to the upper and middle regions of the facial skeleton, including the zygomatic arch. It provides excellent access to these areas with minimal complications.[13]

Following successful reduction of the condyle, a two weeks period of IMF is required because the reduced condyle tends to dislocate back to the preoperative position, and the IMF allows a period of healing for the presumably damaged ligaments.[8] The application of an IMF over at least one or two weeks period was applied in nearly all of the previous reported cases.

In addition to the treatment, an intense physiotheraphy and a long term follow -up is required in order to minimize the risk of ankylosis.[7,8] When the joint is grossly damaged, the risk of developing future ankylosis is high. In cases with imperfect reduction, with induced fibro-osseous ankylosis of the joint or when the risk for future ankylosis is surely to occur, the surgeon may consider prophylactic condylectomy together with some form of reconstructive arthroplasty.[5]

Satisfactory results were only achievable in 59% of the reviewed cases done by Marcio et al in 2011, and the criteria

include: 1) a mouth opening >30 mm and 2) a sastisfactory occlusion.[6] When the treatment was delayed for more than seven days, the reduction showed unsatisfactory result. In our case, treatment was given at post trauma day four and the result was satisfactory.

CONCLUSION

Superolateral dislocation of the mandibular condyle is rare and occurs in many forms thus making the treatment differs for each patient. Early diagnosis and reduction is critical in managing TMJ dislocation. Late reduction of the mandibular condyle will further increase the risk of fibro-osseous ankylosis which further complicates the management. Type III dislocation of the mandibular condyle is extremely rare .[3] In this present case, the head of left condyle was hooked above the unfractured zygomatic arch and together with swelling of the surrounding tissues making manual reduction almost impossible. From our experience, surgical approach through a coronal flap provide good visualization of the trapped condyle intraoperatively. To date, this may represent the only reported case where surgical access via a coronal flap was used. Postoperatively, the patient reported a good and successful outcome.

DISCLOSURE

All authors have contributed to the manuscript equally. None of the authors have direct or financial conflicts of interest with this paper and material contained herein.

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