Dislocation of Mandibular Condyle Into Middle Cranial Fossa: Two Alternative Methods for Two Patients

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Dislocation of the mandibular condyle into the middle cranial fossa is rare, and the number of cases discussed in published studies is limited. Various treatment routes have been suggested, and the entire published data are based on the presentations of single cases. The present report presents 2 cases of dislocation of the mandibular condyle into the middle cranial fossa. The first case was treated with closed reduction in the early stage; however, the second case, which was treated in the late stage, required open reduction. Both the methods of reduction and the key aspects of diagnosis are discussed.

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Fractures in the condylar section of the mandible in the neck or intra-articular area and dislocation from the glenoid fossa to the anterior or lateral area have been very well defined in published studies.[1] However, research describing penetration of the intact mandibular condyle through the fossa is quite limited.[1-3] The present study reports on 2 cases of dislocation of the intact mandibular condyle into the middle cranial fossa. One was treated using open reduction and the other with closed reduction.

Case Report

CASE 1

A 35-year-old woman with growth and developmental delay consulted the emergency service because of pain in her jaw after a fall. She was conscious and cooperative. A soft tissue laceration was detected on the gonion. The physical examination revealed limited mouth opening (Fig 1), an anterior open bite, and pain in the preauricular area. No otic symptoms, such as loss of hearing, otorrhea, or hemotympanum, were found. The computed tomography (CT) scan revealed that the left condyle had broken through the glenoid fossa and dislocated into the middle fossa (Figs 2, 3). The left condyle had also broken the fossa, but it had not dislocated. The patient was evaluated by the neurosurgery department, and no intracranial pathologic features were found. Within 16 hours after the accident, general anesthesia was applied, and closed reduction was attempted using neuromuscular blocking. Reduction of the mandible was attempted by applying pressure on the molars, on which formation of normal occlusion was observed. After palpation on the condyle fossa, it was acknowledged that reduction had occurred. Next, intermaxillary fixation (IMF) was placed through the use of a posterior bite block. The postoperative CT readings confirmed the reduction, and no intracranial pathologic features were observed (Figs 4, 5). After 2 weeks of IMF, jaw movement exercises and physiotherapy were started. At 6 months postoperatively, a mouth opening width of 32 mm was observed (Fig 6). No late complications developed.

CASE 2

An 18-year-old woman consulted our team with complaints of difficulty in opening her mouth 3 weeks

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FIGURE 1. Patient 1, with restricted mouth opening seen on the early preoperative photograph. The soft tissue laceration on the mentum was covered with a medical dressing.

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after a traffic accident. Limited mouth opening, an anterior open bite, and a cross bite were detected at the initial examination. She had palpation-induced pain in the preauricular area, but no neurologic deficit. A CT scan revealed superolateral dislocation of the right condyle and dislocation into the middle cranial fossa (Figs 7, 8). No intracranial pathologic features were observed during the neurosurgical consultation. No middle ear pathologic features were detected either. After consulting the neurosurgery team, an operation was planned. After ensuring neuromuscular blocking with the patient under general anesthesia, closed reduction was attempted. However, the condyle could not be relocated through palpation, and the patient's occlusion was not corrected. Therefore, we concluded that the reduction was not successful. A preauricular incision was created for open reduction. The condylar neck and glenoid fossa were relocated, the fibrotic tissues were freed, the callus was cleansed, and condylar reduction was achieved by pulling the mandible down. The fractured fragment in the fossa was relocated by way of the condylar reduction, which eliminated the need for any additional reconstruction of the fossa. No cerebrospinal fluid leakage or acute bleeding was observed in the fractured area. The mandible was then fixed using IMF. No intracranial pathologic features were detected on the postoperative CT scan. The condylar position was checked and active physiotherapy started. By 1 year postoperatively (Fig 9), a mouth opening of 35 mm had been achieved (Fig 10), indicating a successful result (Figs 11, 12).

Discussion

Dislocation of the mandibular condyle into the middle cranial fossa was first reported by Dingman and Grabb[4] in 1962.[1] A total of 54 case presentations were reported in English language publications in which this type of injury is reported. The most comprehensive review was conducted by Barron et al[5] in 2002. The published English language studies were scanned, and the basic parameters concerning age, gender, treatment, and follow-up were analyzed[5-48] (Table 1).

It is understood by observing the anatomic structure of the temporomandibular joint that this pathologic entity rarely occurs. It is a type of fracture that occurs especially among children. This is because the medial and lateral ends of the matured condyle are more defined in adults, which results in a wider condylar surface.[6] This wide surface reduces the pressure on a given surface area in the case of trauma and is a protective mechanism for the fossa. Additionally, the mandibular neck is relatively weak and breaks easily, which also protects the glenoid fossa against penetration due to the absorption of shock.[49] Research has indicated that the condylar area is larger than the glenoid fossa in adults,[7,49] which protects the condyle against central dislocation. Under these circumstances, the forces landing on the jaw from the posterior superior direction might cause such fractures if the mouth is open.[7-9] Although both of our cases involved adult patients, the first case was syndromic that featured growth and developmental delay.

The clinical presentations can differ. The initial examinations can lead to findings that indicate fracture of the subcondylar area and/or to findings indicating intracranial laceration.[10] Anterior ear pain, trismus, and unilateral hearing loss can be present, as well as intracranial findings such as intracranial bleeding, facial nerve paralysis, otorrhea, and somnolence and extracranial findings such as premature posterior occlusion due to the shortened ramus length, laterognathia, an anterior open bite, and laceration of the exterior auditory canal.[1,7]

During the diagnosis phase, the radiologic evaluation findings and clinical findings will complement each other.[1] Because of the nature of the injury, the clinical findings can misleadingly indicate subcondylar fracture.[2,7] Therefore, a radiologic examination is essential. It is known that planar radiography and