

## Superior Migration of Mandibular Condyle into Middle Cranial Fossa

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**Abstract :** A rare case of superior migration of mandibular condyle into middle cranial fossa is reported.

**Keywords :** superior migration, Mandibular condyle, Middle cranial fossa

### Introduction

Condylar injuries following trauma to the mandible are relatively common and generally present as condylar neck fractures or anterior dislocations of the temporomandibular joint. Fractures of the condyle account for between 25% and 35% of all mandibular fractures in reported series.<sup>1</sup> However, cases of superior dislocation of the mandibular condyle into the middle cranial fossa are rare. It may be that injuries of this type are in fact more frequent than those previously reported, but survival of the patient is affected due to severe neurological damage.

Since superior migration of mandibular condyle is rarely encountered, a team work is mandatory for successful management. This problem is hitherto not reported in India.

### Case Report:

A 19 years old young man was admitted in our hospital in Dec 2003, following a RTA while riding a two wheeler. Patient skit on the road and dashed his face on a tree. At the time of admission the patient was restless, GCS – 8 /15. A 2 cm cut injury was observed on the right side of the forehead. Since the patient was restless, emergency resuscitation was performed and endotracheal intubation was done using 7.5 ft tube by the ICU junior medical officer and connected to ventilator with muscle relaxants. Nasal & oral bleeding was present. Subsequent to stabilization, a CT brain was obtained and the patient was returned to ICU. The radiologist noticed the mandibular condyle at middle cranial fossa on left side. (fig. 1) Since the patient was on oral endotracheal tube occlusion of mandible was not observed. Clinically-

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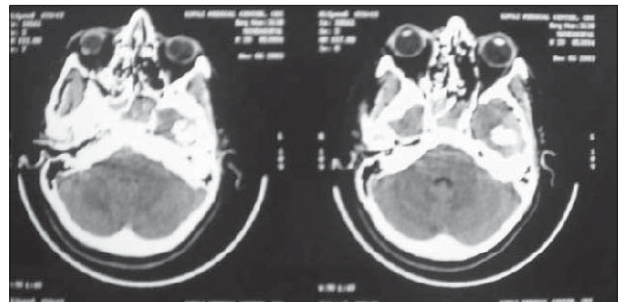


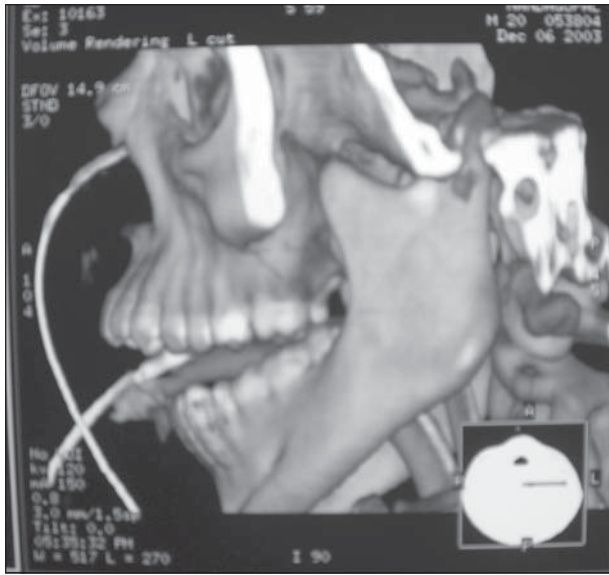
FIGURE 1. CT Scan Showing Condylar Head in Middle Cranial Fossa.

restricted jaw movements noticed. A 3D – CT was taken to assess the mandibular and other facio maxillary injury which showed superior migration of the intact left mandibular condyle into middle cranial fossa.(fig.2a, 2b)

An attempt was made in the ICU by the facio maxillary surgeon to reduce the superior dislocation. However the procedure failed to reduce the condyle. Team of doctors which included Neurosurgeon, Facio maxillary surgeon and Plastic surgeon planned the



FIGURE 2A. 3D CT – Preoperative Coronal View, Superior Migration.

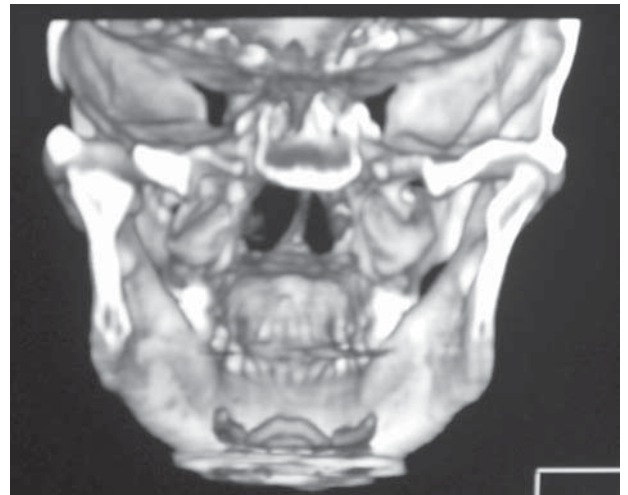


**FIGURE 2B.** 3D CT – Preoperative Lateral View, Superior Migration

technique for reducing the dislocation. While the patient was still paralyzed and ventilated with anesthesia support patient was shifted to operation theatre. Following tracheostomy, occlusion was checked. Ipsilateral gagging, posterior open bite and restricted jaw movements were observed. Various techniques of closed reduction under general anesthesia were attempted. Manual reduction with finger pressure attempted but in vain. Another attempt with 24 gauze tie wires placed around the molar held with cokers and manipulated down on the ipsilateral side with upward pressure over the chin but failed. Hence open reduction was performed through a left temporal craniectomy. The middle cranial fossa was approached. The mandibular condylar head was seen in the middle cranial fossa with fracture of glenoid fossa like a trap door. A moderate basal extradural hematoma was observed and the dura was lacerated at the inferior surface of the temporal lobe with cortical contusion was observed. Mandibular mobilization from externally produced significant movement of the mandibular condylar head in the middle cranial fossa with the neck as a fulcrum. Further reduction was tried by trying to push the head from within the cranial fossa and by pulling the mandible from outside by facio maxillary team. The fractured bony segments did not allow the relatively bigger condylar head. Subsequently the bone of the mid cranial fossa around the condylar head was nibbled and excised. Thus forming a big opening which facilitated the reduction of the mandibular condyle into the partially intact glenoid fossa by manipulation. Capsule of the joint was seen ruptured, and they were preserved. Good interdigitable occlusion achieved after reduction.

A silastic sheath was placed over the condylar head to act as a capsule and the defect of the middle cranial fossa and roof of the glenoid fossa was reconstructed and closed with bone harvested from the outer table of the fronto temporal bone. At the same time inter maxillary fixation was done subsequently. The craniectomy side was closed with dural patch.

Post operatively the patient was weaned out of ventilator after 2 days with antiedema measures. The patient's neurological recovery was excellent. Post operative CT taken showed a good reduction with the intact bone placed at middle cranial fossa.(fig.3a, 3b) Inter maxillary fixation was released after 6 weeks. Follow-up 3D CT taken showed good condylar position in the glenoid fossa without signs of ankylosis.(fig 4a, 4b) Inter incisal mouth opening was 20mm, with good inter digitable occlusion. After four month following



**FIGURE 3A.** 3D CT – Immediate Postoperative Coronal View, Good Reduction.



**FIGURE 3B.** 3D CT – Immediate Postoperative Lateral View, Good Reduction



FIGURE 4A. 3D CT Four Months Postoperative Coronal View.

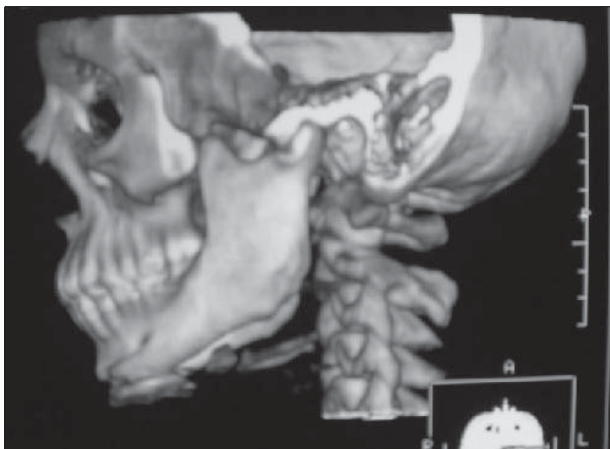


FIGURE 4B. 3D CT Four Months Postoperative Lateral View.

surgery the inter incisal mouth opening improved to 32mm, with good occlusion. However a mild deviation of mandible to left was observed on opening movements.(fig.5)



FIGURE 5. Satisfactory Mouth Opening. Notice Mild Deviation of Mandible to the Left. Four Months Post Operative.

## DISCUSSION

Dislocation of the mandibular condyle into the middle cranial fossa is a rare phenomena. The first case was reported in 1958 by Stolman.<sup>2</sup> Twenty seven cases have been reported in English literature. This Injury is much more common among children and young adults than in the elderly. Commonly occurs with high-speed accidents and most probably when there is a sudden blow to the chin when the mouth is in the open position.<sup>3</sup> The infrequency with which central dislocation of the mandibular condyle occurs has led some authors to propose a set of anatomic features that might explain this injury. These features include a small rounded condyle, extensive pneumatization of the temporal bone, a thin roof over the glenoid fossa and missing posterior teeth. Diagnosis of this injury is based on clinical and radiographic examination especially with high resolution 3D CT scans. The reported cases present with mild preauricular tenderness, deviation of the mandible to the affected side, malocclusion with an anterior open bite and a restriction in mouth opening and closing. These signs as well as bleeding from the external auditory canal have been consistently seen with this injury. Patients in whom there are more extensive traumatic injuries have also had hearing loss from damage to the inner ear, cerebrospinal fluid otorrhea and injury to the facial nerve where it courses through the facial canal.

The aim of treatment is to reposition the dislocated condyle, restore the normal occlusion and mandibular function.<sup>4</sup> There are conflicting ideas in the literature regarding the methods that should be used in treating a superior condylar dislocation. Various direct surgical approaches to the condyle have been used, including intracranial condylectomy with the use of rongeurs, in conjunction with a neurosurgeon, condylectomy via a preauricular approach leaving the condyle in situ and condylectomy with the use of fascia lata or Silastic as an interpositional material. A direct approach to the condyle was used in the early cases as it was thought that vigorous manipulation could kill the patient. Nonsurgical methods used have included manual reduction the placement of a mouth prop in the molar region with upward pressure on the chin and slow elastic traction with splints. Nonsurgical methods have been most successful in those cases in which early diagnosis of the injury has been made.<sup>5</sup>

Our experience with this first encounter enable us to make few comments on this rare problem.

In severely head injured patients it is difficult to diagnose superior migration of the mandibular condyle. CT scan of brain, base of the skull and facio maxillary

region is mandatory in patients with facial injuries. Superior migration of condyle does not pose much problem in orotracheal intubation, especially when a patient is given relaxant. Closed reduction of the condyle in a trapped door like situation is difficult. Open reduction is safe, as it provides good visualization of the pathology and facilitates to treat brain contusion as well. Facio maxillary, plastic and neurosurgeons should form a team for a successful management of this rare problem since the final result is not only pulling the condyle out of middle cranial fossa but to obtain good occlusion of mandible and maxilla without ankylosis at the temporo mandibular joint in long run.

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