

Surgical Treatment Of Unusal Medially Displaced Condylar Fracture: A Case Series

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Abstract

Mandibular fractures are the most common type of facial bone fractures. The displacement of the mandibular condyle into the skull following glenoid fossa is known as dislocation of the mandibular condyle into the middle cranial fossa. Medially displaced condylar fractures represent a significant subset of mandibular fractures, posing challenges in diagnosis and management. The etiology and biomechanics underlying medially displaced condylar fractures are discussed, emphasizing the common mechanisms of injury such as direct trauma or indirect forces transmitted through the mandible. The management of medially displaced condylar fractures requires a tailored approach considering various factors including patient age, fracture displacement, associated injuries, and functional outcomes. Surgical techniques such as open reduction and internal fixation gives a better result in achieving occlusion and mouth opening. A guardsman fracture, which is typically observed in elderly people after a fall on the chin, is characterised by bilateral condylar fractures combined with a symphysis fracture. The purpose of this article is to present a case series of condylar fracture with their management.

Keywords: condylar fracture

INTRODUCTION:

Maxillofacial trauma frequently results in mandibular fractures. Dislocation of the mandibular condyle into the middle cranial fossa was initially identified by Dingman and Grabb in 1963 as an unusual lesion occurring from facial trauma. Men can suffer mandibular fractures up to four times more frequently than women do¹. According to a US National Trauma Data Bank research, assault is the leading cause of mandibular fractures in men, whereas falls and car accidents account for most fractures in women³. The condylar process is divided into three subregions by the AOCMF to determine a fracture classification: the head region, condylar neck, and condylar base⁵. Unilateral mandibular condylar fracture patients frequently exhibit typical symptoms, such as restricted mouth opening with chin deviation to the affected side, unilateral preauricular pain, and malocclusion³. Bilateral preauricular pain, diminished mouth opening, and an anterior open bite with early bilateral contact in the molar region are typical symptoms of bilateral condylar fractures⁵. The latter are frequently observed in conjunction with

mandibular symphysis or Para symphysis fractures. Controversial in nature, the choice of treatment for condylar fractures depends on a number of variables, including the age and comorbidities of the patient, the existence of other mandibular or maxillofacial fractures, whether the fracture is unilateral or bilateral, the level and displacement of the fracture, the presence and condition of dentition, dental occlusion, and the surgeon's skill level. A variety of therapeutic strategies, such as conservative treatment consisting of analgesic medication, soft diet, and physiotherapy, have been documented for condylar fractures². Surgery or intermaxillary fixation (IMF) are additional performed. Endoscopic or open reduction internal fixation (ORIF) procedures are both possible for surgery. Despite the existence of several recommendations, there is still controversy around the management of mandibular condyle fractures. A meta-analysis contrasting conservative treatment with ORIF for patients with condyle fractures was carried out by Kyzas et al. This implies that conservative therapy may not always be superior to ORIF for condylar fractures^{6,7}. When individuals have condylar fractures, malocclusion is one of the main long-term complications. Additional chronic

issues mentioned in the literature include condylar resorption, development problem, persistent discomfort, temporomandibular joint dysfunction, nerve damage, and non-union or malunion. In our field, condylar fractures are common^{4,5}. It is crucial to look into the nature of these issues in order to prevent or reduce them as much as possible because they may have a significant influence on the patient's day-to-day functioning.

CASE1:

A 17 years old boy reported to department of oral and maxillofacial surgery with chief complaint of reduced mouth opening and jaw pain bilaterally in the past 30 days. A brief history of patient revealed that patient had met with a road traffic accident while driving bike. Positive mouth and ear bleeding

was reported with left side of femur fracture by the patient. Extra-oral examination revealed a bony protrusion over the zygomatic-temporal regions on both sides, as well as a significantly posteriorly displaced mandible. Sutured wound of around 1×3cm was present over chin region and tenderness present over mandibular symphyseal region. Intra oral examination reveals a primary fixation over mandibular right central and lateral incisor. Reduced mouth opening of 10mm present. CT done at the time of incidence revealed that the mandible was positioned posteriorly and the condyles stumps were superolateral dislocated (fig.1) and medially displaced condylar head (fig.3). The CT scan also revealed a fracture of the mandibular symphysis without displacement(fig.2)



Fig.1a



Fig.1b

3D images of CT scan showing bilateral superior lateral dislocation



Fig.2 3D images of CT scan showing compound mandibular symphysis fracture

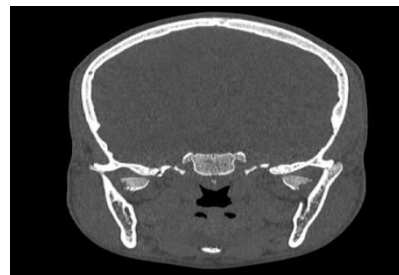
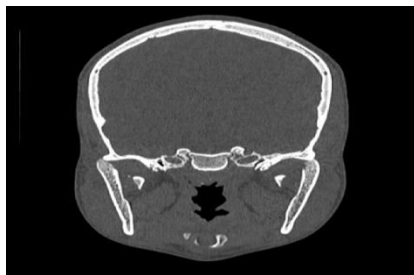


Fig.3 coronal section of CT showing medially displaced condylar fracture

Al Kayat Bramley incision given bilaterally on exposure fractured condylar heads found to be fused by callus formation on base of cranium(fig.5). Pseudo ankylosis was found after exposure(fig.6). Bilateral condylar neck released followed by osteotomy and bilateral temporal myofascial flaps harvested and sutured hinged to medially displaced articular disc for anchorage and interposition above condylar necks(fig.8). Closure done in layers. Occlusion and condylar motions were both favourable. The operating table was able to obtain a mouth opening of 40 mm. IMF was performed following surgery for a week.



Fig.5 Incision

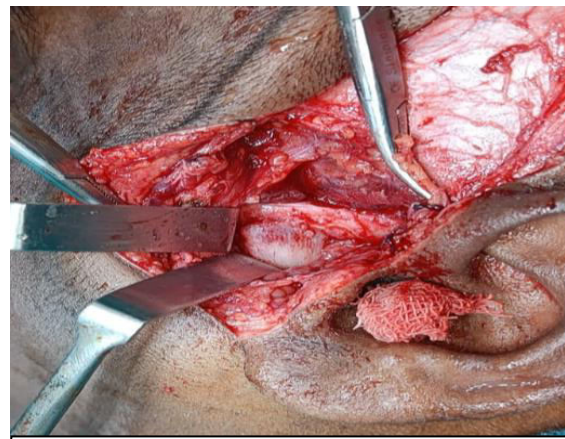


Fig.6 Fusion of condyle with Zygomatic arch



Fig.7 Removal of ankylosed part

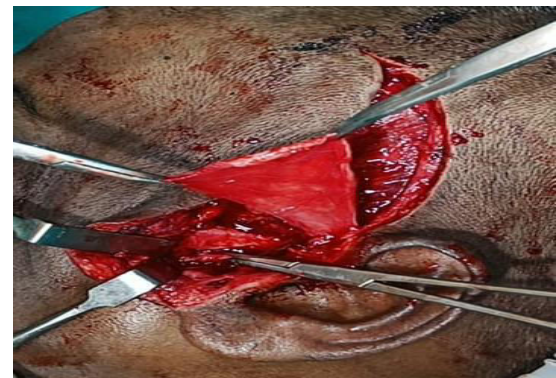


Fig.8 Interposition Graft Placement

CASE 2:

A 20 years old male reported to department of oral and maxillofacial surgery with chief complaint of reduced mouth opening and jaw pain in the past 24 day. A brief history of patient revealed that patient had met with a road traffic accident while driving bike. Positive mouth and left ear bleeding were reported with by the patient.

Extraoral examination revealed healed abrasion present over nose. Bony protrusion over the zygomatic-temporal regions on left side. Intraoral examination revealed bilateral occlusion unstable, restricted mouth opening of 15mm. CT scan revealed that medially displaced left condylar head of mandible. AlKayat Bramley incision given on

left side for exposure of fractured condylar heads. Layer by layer dissection done. Pseudo ankylosis was found after exposure. Left condylar neck released followed by osteotomy and left temporal myofascial flaps harvested and sutured hinged to medially displaced articular disc for anchorage and interposition above condylar necks. closure done in layer using Vicryl 3-0 and nylon 4-0. The operating table was able to obtain a mouth opening of 30 mm. IMF was performed following surgery for a week.

CASE 3:

A 19 years old male reported to department of oral and maxillofacial surgery with chief complaint of

reduced mouth opening and jaw pain in the past 30 day. A brief history of patient revealed that patient had met with a road traffic accident while driving bike. Positive mouth and right ear bleeding were reported with by the patient.

Extraoral examination revealed healed abrasion present over nose. Bony protrusion over the zygomatic-temporal regions on right side. Intraoral examination revealed bilateral occlusion unstable, restricted mouth opening of 18mm.

CT scan revealed that medially displaced right condylar head of mandible. Al Kayat Bramley incision given on right side for exposure of fractured condylar heads. Layer by layer dissection done. Pseudo ankylosis was found after exposure. Right condylar neck released followed by osteotomy and right temporal myofascial flaps harvested and sutured hinged to medially displaced articular disc for anchorage and interposition above condylar necks. closure done in layer using Vicryl 3-0 and nylon 4-0. The operating table was able to obtain a mouth opening of 35 mm. IMF was performed following surgery for a week

DISCUSSION:

The incidence of injuries to the maxillofacial region varies according on demographic distribution. Traffic accidents and interpersonal violence are the most frequent causes of trauma, according to reports. Other causes of maxillofacial injuries include animal bites, sports injuries, falls, penetrating injuries, and fire arm injuries^{6,7,8}.

The mechanism of injury determines the fracture pattern. The most frequent cause of condylar fractures is indirect forces. Force applied in the direction of the mandible's angle will typically fracture the condylar head, whereas force applied in the direction of the mandible's chin and body may fracture the condylar neck and Sub condylar fractures⁹.

According to Marsel et.al Fibrous granulation tissues arrange hematomas during the fracture healing process; soft and hard calluses then develop and change. The hematoma that develops around the TMJ after TMJ trauma also heals similarly to a fracture. We discovered that layers of fibrous and cartilaginous tissues were ordered according to Sawhney's classification, and that the fibrous area had many capillaries^{7,9,10}. In type I ankylosis, there were few capillaries in the cartilaginous area; in type II ankylosis, there were many fibrocartilaginous tissues and capillaries in the osteophyte centres and the junction between the cartilaginous ankylosis and the bony surface; in type III ankylosis, there was cartilaginous-bony ankylosis and no visible capillaries.

Various complications occur if condylar fracture left untreated for long period of time. Cessation of growth caused by trauma (including iatrogenic),

inflammatory or infective arthritis, ankylosis or rarely primary growth arrest will lead to failure of the ramus to lengthen with subsequent facial abnormalities of retrusive chin point, occlusal cant and shortened posterior face height. Longstanding disturbance of growth will lead to the appearance commonly recognised as hemifacial microsomia, and whilst this can be a primary abnormality, secondary causes of condylar growth arrest may lead to this appearance. Similarly bilateral disease will lead to the "bird chin" deformity¹⁷.

There have long been supporters of both open and closed reduction techniques for condylar fracture management, which has been described as a mystery. It is still uncommon to treat condylar skull fractures surgically. Despite the lack of agreement, proponents of open reduction assert that the long-term functional results are greater. In the follow-up period, Complete functional re-establishment including mouth opening and jaw movements were achieved postoperative^{11,12}. The surgical techniques used on patients with condylar head fractures are crucial because they should reduce the chance of iatrogenic facial nerve damage while allowing enough exposure for fracture reduction and fixation.

To determine the best surgical technique, preauricular approach allowed for good access and maximum visualisation of medially dislocated condyle fracture heads. For a duration of one to three weeks, all patients undergoing open surgical surgery were fitted with intermaxillary guiding elastics^{13,14}. Nonetheless, all patients exhibited stable closure, good mandibular movement, and maximum visualisation of their medially dislocated head of the condyle fractures at the conclusion of the follow-up period.

CONCLUSION:

Patients with a guardsman fracture or bilateral condylar fracture have a markedly increased risk of malocclusion and general problems. A persistent nerve issue is more likely to develop if there is a guardsman fracture or associated mandibular body fracture.

Secondary conservative treatment is primarily used in this group of patients, even though most of them had already received combination ORIF and IMF for long-term problems. Secondary surgery is typically used to treat individuals who experience long-term problems following primarily conservative therapy or IMF. Treatment for guardsman fractures needed to be discussed more. Treatment for the dentate segment should come first, then the non-dentate part.

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