

Case Report

First report of mandibular ramus fracture associated with anterior dislocation of ipsilateral condyle into temporal fossa and locked jaw: A Rarity

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ABSTRACT

Mandibular ramus fracture is the second least common variant of fracture of mandible. Recently there has been an upsurge in the incidence of ramus fracture due to high velocity road traffic accidents. Ramus fracture is mostly seen in association with other mandibular fracture. This is the first report of mandibular ramus fracture associated with anterior dislocation of ipsilateral condyle into temporal fossa which was treated successfully under local anaesthesia by closed reduction.

Introduction

The incidence of ramus fracture varies from 3 to 5 % amongst mandibular trauma patient as reported in various studies [1–4]. Due to lack of sufficient literature, ramus fracture is not well understood and demarcated. Ramus fracture is mostly seen in association with other mandibular fractures. Management of ramus fractures is still an enigma and no clear consensus exists for open or closed reduction of ramus fracture.

The purpose of this article is to report an unusual, possibly unique combination of ramal fracture with anterosuperior dislocation of condyle into temporal fossa and its treatment consideration.

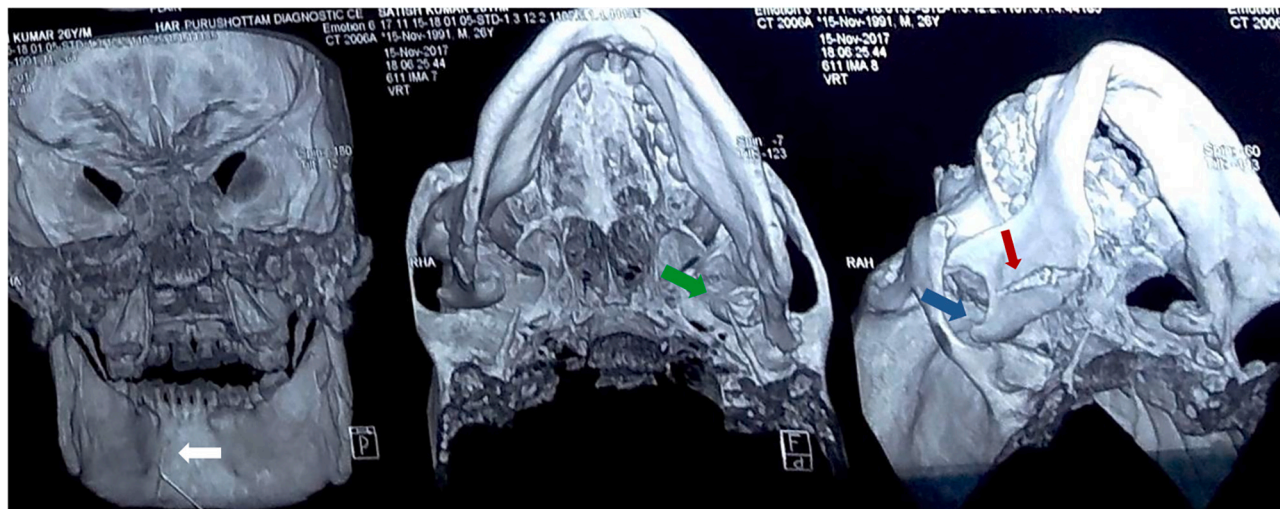
Case report

A 28 year old male patient reported with complaint of inability to close the mouth since 2 days following trauma. Patient was apparently normal 2 days back when he met with a road traffic accident while driving a two wheeler. Patient could recall that at the sight of cow suddenly crossing the road, he lost control over the bike and fell on the road with impact on the chin. Patient was hospitalized immediately in the nearby centre where primary treatment was done and CT scan was taken. Patient was then referred to our centre for definitive management.

Patient presented with facial asymmetry, deviation of lower jaw to the left side, contusion over the chin on left side and injury to the lower lip. Intraorally, occlusion was deranged with bilateral posterior premature contact and anterior open bite and protruded mandible (Fig. 1a). CT scan revealed oblique fracture line running from right sigmoid notch to the angle of mandible, incomplete fracture of left parasymphysis and sagittal split fracture of left condyle (Fig. 1b). Interestingly the fractured portion of mandible was

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a



b

Fig. 1. a. CT scan reveals right Ramal fracture (*red arrow*) with dislocated condyle into temporal fossa (*blue arrow*), sagittal fracture of conyle left side (*green arrow*) and left parasymphysis incomplete fracture (*white arrow*).

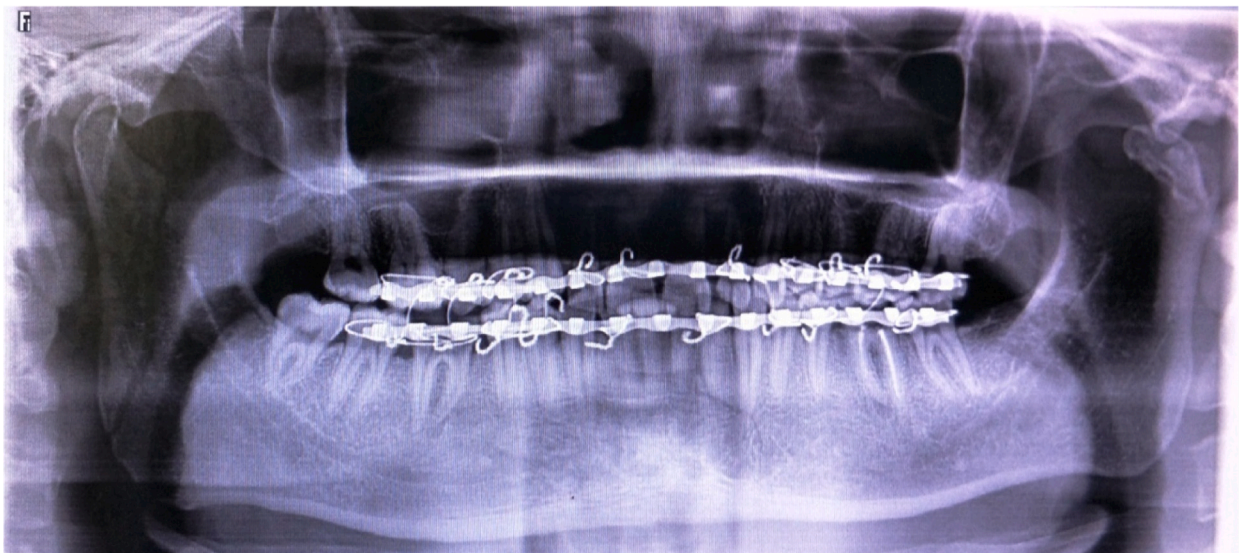
b. Intraoral photograph showing premature posterior contact, anterior open bite and protruded mandible. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

dislocated anterior to the articular eminence on the right side which explained the unusual presentation of locked jaw with mandible in protrusion and deviation of chin.

After discussing the possible treatment options, patient agreed for closed reduction under local anaesthesia. Preoperatively, patient was given anxiolytics and muscle relaxant to reduce tension, anxiety and muscle spasm along with I.V. antibiotics and analgesics. Upper and lower arch bar fixation was done under local anaesthesia. Following this local infiltration was given in the preauricular region into the depression in the glenoid fossa left by dislocated condyle. After achieving adequate anaesthesia in preauricular region, patient was asked to do movements of lower jaw. Dislocated condyle was palpable anterior to articular eminence and manipulation was done in manner similar to Yurino's method [5] by placing thumb of left hand on the dislocated condyle and left hand to hold the lower jaw. With opening and closing motion of lower jaw and patient relaxed, the dislocated condyle was pushed downward during closure with simultaneous upward movement of lower jaw with left hand. By this maneuver the condyle was reduced back into the glenoid fossa and occlusion was achieved instantly (Fig. 2a). Intermaxillary fixation was then completed using tie wires. Immediate post operatively OPG was taken to ensure the reduction of condyle back into fossa (Fig. 2b). OPG revealed adequate anatomical



a



b

Fig. 2. a. Postoperative photograph showing satisfactory occlusion.

b. Immediate post-operative OPG of the patient reveals successful reduction of dislocated condyle on right side.

reduction of ramus fracture with reduction of condyle into fossa. Patient was kept on intermaxillary fixation for 4 weeks. After 4 weeks, IMF was released and occlusion was found to be satisfactory with limitation in mouth opening. Patient was kept on regular follow-up with mouth opening exercises.

Discussion

Anatomically, the area of mandible that lies between the subcondyle and angle region is considered as ramus of mandible. This region is composed of thick cortical bone and draped by masseter buccally, medial pterygoid muscle lingually and pterygomassetric sling inferiorly [6]. Due to these anatomic considerations this is a less commonly fractured site with minimal displacement after fracture. There are different pattern of fracture in these areas, for instance, line either running obliquely from sigmoid notch to the posterior border of mandible, running horizontally from anterior border to posterior border of mandible, or running from coronoid process to posterior border of mandible. Agarwal et al. [4] classified ramus fracture into five distinct pattern. The most commonly encountered fracture pattern in ramus fracture is type I & type II [4]. In our case the fracture line is running from sigmoid notch to the angle of mandible with concomitant dislocation of condylar process anterior to the articular eminence which is a unique combination as it has not been reported in the literature till date. In subcondylar fracture, fracture side is retrusive rather than protrusive & the fractured condyle when palpated does not follow the movement of the mandible. This was in contrast to the findings in this case.

Worthington et al. [7] described the mechanism of dislocation of condyle into temporal fossa in 1982 wherein it was assumed that for condyle to dislocate anterior to articular eminence, the jaw should be wide open at the time of impact as a response to fear or fright [7]. We concur with this assumption and propose the stepwise mechanism for this unique combination of mandibular fracture.

Firstly, at the site of fear of accident there is acute dislocation of jaw on right side. When jaw is unilaterally dislocated in this manner, the dislocated condyle lies anterior to articular eminence and the contralateral condyle is rotated along vertical axis and moves posterosuperior in the joint space. Subsequently a blow to the left side of the chin causes dislocated jaw to fracture vertically from sigmoid notch to angle of mandible on right side and contralateral condyle hits the temporal bone and splits sagittally. At the site of direct blow greenstick fracture of left parasymphysis was seen. We assume two factors are very important for Fracture of Ramus on right side, first spasm of lateral pterygoid muscle as a reflex during fright response and second is locking of condyle and coronoid process between thick articular eminence posteriorly and posterior surface of the frontal process of the zygomatic bone anteriorly.

The management of dislocation by local analgesia assisted by sedation and muscle relaxants was described by Johnson [8]. This is based upon the theory that the dislocation is maintained by muscle spasm secondary to painful stimuli arising from the capsule, and treatment consists of injection of joint with lignocaine hydrochloride [6,8].

Ramus fractures are conventionally treated by closed reduction owing to the difficult accessibility and also because it seldom causes derangement of occlusion. Open reduction and internal fixation allows for early return to function, oral hygiene maintenance and improved nutrition [9]. However, it requires extraoral technique for plating due to limited access intraorally or transbuccally. In our case we achieved good anatomical and functional reduction with closed reduction along with successful reduction of dislocated condyle into glenoid fossa.

Ramus fracture with ipsilateral condylar dislocation has not been reported in the English literature before. This case report explains the treatment approach for simultaneous reduction of dislocated condyle and ramus fracture by closed reduction.

Declaration of competing interest

Patient consent obtained.

No potential conflict of interest.

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