

# DELAYED POST TRAUMATIC FACIAL NERVE PALSY ON CONTRA LATERAL SIDE OF ISOLATED MANDIBULAR FRACTURE: A RARE CASE REPORT

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## ABSTRACT

Post traumatic facial nerve paralysis is not a common complication. Only 5% of all the facial palsies are due to trauma. Moreover, it is common due to fracture of the temporal bone with transaction or compression of the facial nerve. Less commonly facial paralysis due to isolated mandibular fracture without temporal bone fracture have been reported in literature. Rarely, mandibular fractures can present with concomitant facial nerve injury. In cases where the nerve injury is incomplete or delayed, prognosis is excellent. This article reports a case of delayed onset of facial paralysis with isolated mandibular fracture.

**Key words:** Delayed, Bell's palsy, Mandibular fracture, Aetiology, Trauma

## INTRODUCTION:

Idiopathic peripheral facial nerve paralysis is the most common cause of facial nerve palsy. It is commonly known as Bell's palsy<sup>[1]</sup>. Bell's palsy is defined as "an acute unilateral paresis or paralysis of the face in a pattern consistent with peripheral nerve dysfunction without detectable causes"<sup>[3]</sup>. It is typically unilateral or can be complete or partial. Although there is

agreement on definition, there is no consensus regarding the aetiology, diagnostic approach, or management of this condition<sup>[2]</sup>. The aetiology of the facial nerve paralysis ranges from cerebrovascular accident to iatrogenic damage but there are few reports of facial nerve paralysis attributed to mandibular fractures and that is on contralateral side of isolated mandible fracture. This case report describes a patient who presented

with right parasymphysis & left subcondylar fracture of the mandible & facial paralysis of the right side which develop after the 48 hours of the trauma.<sup>[4]</sup>

### **CASE DETAIL:**

A 30 year old male patient reported to the emergency department with history of road traffic accident (RTA) when he was hit from side by a fast running car, with no bleeding from nose and ear with no loss of consciousness. Patient could not explain that from which side his head or face struck with road. Right parasymphysis fracture & left subcondylar fracture of mandible was initial diagnosis which was confirmed by radiological investigations (fig1). Patient was fully conscious with Glasgow Coma Scale (GCS) 15. After getting blood investigations done, Erich arch bar applied & normal occlusion achieved by maxillo-mandibular fixation on 3<sup>rd</sup> day of injury. Open reduction & fixation was planned after pre-anaesthetic check up. Next day morning i.e. 4<sup>th</sup> day, patient complained of inability to close his right eye. On examination grade 4 (table 1) facial paralysis of the right side of the face was present (fig 2, & 3). Surgery was postponed & patient was referred to neurosurgeon for expert opinion. Neurosurgeon advised CT-scan of the head & there were not any extradural or intradural hematoma & no temporal bone fracture was seen (fig. 4). Otolaryngologist also ruled out any abnormality after complete examination. However we prescribed the tablet prednisolone 60 mg per day in divided doses for 1 week & then slowly tapering it. After the clearance of neurosurgeon & ENT surgeon, the patient was planned to operate under general anaesthesia. ORIF

done with 2.5 mm stainless steel mini bone plates (fig 5). Patient was referred for physiotherapy of the affected area of face two days after surgery. Significant improvement was recorded with physiotherapy in 4 weeks (fig 6) & complete recovery in 20 weeks (fig. 7).

### **DISCUSSION:**

Post traumatic facial nerve palsy account for up to 5% of all cases of facial paralysis.<sup>[5]</sup> Despite the unpredictable nature of the traumatic injuries certain individual nerves are predispose to isolated damage. These include not only the limb nerves but also the facial & spinal accessory nerve.<sup>[6]</sup> The most common cause of unilateral facial paralysis after the trauma is fracture of the temporal bone with either compression place on the facial nerve by displacement of the bony fragments, soft tissue oedema, localized hematoma, or traumatic disruption of the nerve.<sup>[5-8]</sup> Only a handful of cases of unilateral facial paralysis secondary to isolated mandibular fracture without temporal bone fracture have been reported in literature. Most of these have been occurred as a result of ipsilateral condylar fracture or temporal bone fracture. To the best of our knowledge no case of delayed onset peripheral facial palsy contralateral to condylar fracture without associated temporal bone fracture has been documented.

Interesting point is that the patient had no temporal bone fracture, head injury, or abnormal otological findings. These facts suggested the peripheral cause for the lower motor type of facial paralysis in this case. In this patient delayed onset of facial palsy is noted i.e. 72 hrs later of injury. Causes of facial palsy in this case

may be delayed arterial spasm, thrombosis or external compression from bony fragment or soft tissue oedema.<sup>[5,10]</sup> (table 2). If facial palsy develop immediately after the trauma it indicate that either nerve is completely lacerated or contused but delayed onset indicate other causes as mentioned above.

Vascular disturbances consequent upon oedema is the probable cause of delayed onset of palsy in this case as supported by Brusati & Paini.<sup>[9]</sup>

It is important to identify patient with immediate or delayed onset facial palsy, however many of trauma patients usually sustained severe head injury or comatose. Hence some time it is difficult to find out whether it is a delayed onset facial paralysis or emergency department miss the finding on initial examination. This patient was fully conscious when he reported after the RTA & facial nerve paralysis was not present. It develops later i.e. 48 hour after the trauma.

House Brackman system of grading the facial nerve injuries is most commonly used to describe the extent of injury (table 1) & can help predict the likelihood of spontaneous recovery of facial nerve function.<sup>[11]</sup> Evaluations of the patient with traumatic facial nerve injury include, audiological test, electromyography, & high resolution computed tomographic images.<sup>[5]</sup> Other investigation include – serum testing for rising antibody titre to herpes virus, salivary polymerase chain reaction for herpes simplex virus & herpes zoster virus, & serological test for lyme disease. Topognostic test & electroneurography may give useful prognostic information but remain

research tool.<sup>[6,12-14]</sup> Blood test for syphilis, infectious mononucleosis, HIV, leukemia, sarcoidosis may be required. Disappearance of deep tendon reflexes should be check to establish a diagnosis of Guillain- Barre syndrome.<sup>[9,15-17]</sup> In this patient all investigations were within normal range.

Aims of the treatment in facial paralysis are to speed up recovery, to prevent corneal ulceration & restore the blink response.<sup>[18,19]</sup> Seiff & Chang describe a stage management approach to eyelid paralysis following facial nerve paralysis (table 3).<sup>[20]</sup> Management of facial nerve palsy begin with by taking the thorough clinical history followed by comprehensive examination.<sup>[21,22]</sup> Treatment is divided into 3 parts as describe in table 4.

Spontaneous complete recovery occurs in 70% of the cases. In most cases remission begin within 3-4 weeks, with complete spontaneous recovery within 6 month, however associated physiological or pathological condition may alter the prognosis (table 5).<sup>[23]</sup>

## CONCLUSION:

In trauma patient primary focus should be the identification of more severe injuries but if facial nerve paralysis is present it also require a considerable attention. In case of delayed presentation as in this case immediate consultation of neurosurgeon & ENT surgeon is require to rule out the other causes.

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**FIGURES:**



Fig 1: Panoramic radiograph showing fracture right parasymphysis & left subcondylar region



Fig 2: No horizontal wrinkle on right side of forehead



Fig 3 : Deviation of angle of mouth on smiling toward normal (left) side

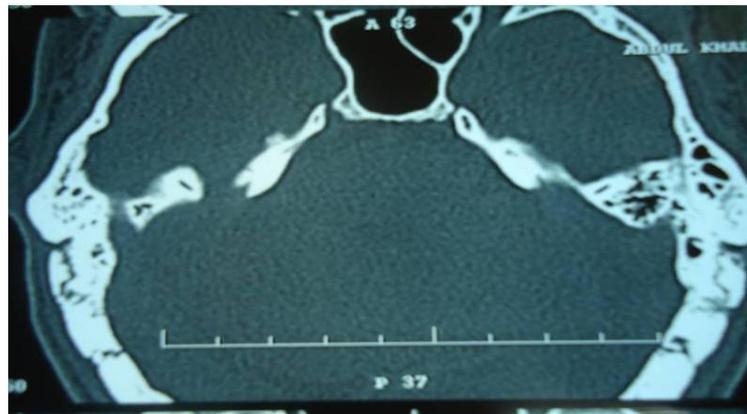


Fig 4 : CT-Scan of head showing no fracture in temporal bone



Fig 5: Post operative panoramic radiograph



Fig 6 : Showing improved closure of the right eye after 4 weeks



Fig 7 : Showing complete closure of the right eye after 20 weeks

**TABLES:**

**TABLE 1:House Brackman grading system for facial paralysis**

Grade 1	Normal function
Grade 2	Mixed dysfunction
Grade 3	Reduced forehead function, noticeable synkinesis & contracture
Grade 4	No forehead movement, incomplete eye closure, asymmetric mouth
Grade 5	Minimal movement
Grade 6	No movement

Note – Data from House JW, Brackmann DE<sup>23</sup>

**Table 2:Causes of delayed onset facial palsy**

1.Vascular disturbances consequent upon oedema
2.Delayed arterial spasm
3.Thrombosis
4.External compression from bony fragment
5.Soft tissue oedema

Note – Data from Brigitte M. Baumann, Jannifer Jaecki<sup>5</sup> & S. Kumar, R. Gupta<sup>10</sup>

**Table 3:Seiff & Chang classification of facial palsy management**

Stage 1	Supportive
Stage2	General facial reanimation
Stage 3	Lower lid support
Stage 4	Passive upper lip animation
Stage 5	Dynamic lid animation
Stage 6	Soft tissue repositioning

Note – Data from Seiff SR, Chang J<sup>20</sup>

**Table 4:Management of facial paralysis**

Management of facial paralysis
1. Conservative
a. Physiotherapy
b. Lubrication of cornea- methylcellulose, preservative free eye drops
c. Taping of eyelid at night
d. Punctal occlusion with punctal plug
2. Medical
a. Botulinum toxin
b. Steroid & Acyclovir
3. Surgical
a. Decompression of facial nerve
b. Torsorraphy
c. Neurorraphy
d. Reanimation
e. Suborbicularis oculi fat (SOOF) lift
f. Repositioning of soft tissue

Note – Data from Mellissa Rodrigues De Araujo, Marcedo Rodrigues Azenha, Marcos Mauricio Capelari, Clovis Marzola<sup>2</sup>, N. Jullian Holand, Graeme M. Weiner<sup>12</sup>, T.S. Shafshak<sup>18</sup>, & Imran Rehman, S. Ahmed Sadiq<sup>22</sup>

**Table 5: Factors influencing the prognostic outcome in facial paralysis**

1. Complete paralysis of facial muscle
2. Pregnancy
3. Minimal recovery by 3 weeks
4. Herpes Zoster infection ( Ramsay Hunt Syndrome)
5. Age above 60 year
6. Degeneration of the facial nerve as demonstrated by electrophysiological testing
7. Diabetes & Hypertension

Note – Data from Imran Rehman, S. Ahmed Sadiq<sup>22</sup>