Evaluation And Management Of Immediate Posttraumatic Facial Nerve Palsy At Sir T Hospital, Tertiary Care Centre In Bhavnagar

Dr. Annapoorna K*, Dr. Sushilkumar.G. Jha, Dr. Krupa Suvagiya***, Dr. Manoj Kumar Meena****, Dr. Krishna Makadiya*, Dr. Annamica*, Dr. Nehal Panchal*, Dr. Prerna Savalya***

*Second Year Resident Doctor, **Professor And Head Of The Department, ***Assistant Professor, ****Third Year Resident Doctor, Department Of Otorhinolaryngology And Head And Neck Surgery, Sir T Hospital Bhavnagar, Government Medical College, Bhavnagar

Abstract: Background: Facial nerve palsy following trauma, is an uncommon condition which occurs in 1.5% patients of skull base fractures, majority of them due to road traffic accidents causing temporal bone fractures. Indication and timing of facial nerve decompression for facial paralysis and anatomical extent of decompression has been a subject of controversy for years. The aim of this study is to present prospective review of 10 patients with immediate facial paralysis after trauma that underwent either surgical decompression of facial nerve via trans mastoid approach or conservative management. Objectives-To know age and sex wise distribution of immediate posttraumatic facial nerve palsy and to know most common grade of presentation according to H-B scale and most common type of temporal bone fractures and segment of facial nerve involved. To study outcome (within 1 month) of various modes of management of immediate posttraumatic facial nerve palsy. Material And Methods: After approval from ethics committee, this prospective cross-sectional study was carried out in 10 patients presented with immediate facial nerve palsy due to trauma at ENT department of Sir T Hospital, Bhavnagar over a period of 1 year from July 2022 to June 2023. After taking consent, proper history was taken and time of RTA and time of presentation at ENT OPD was separately noted. Patients were examined and graded using House and Brackman grading system. All the patients were evaluated and treated either by conservative management (Injectable steroids with facial physiotherapy) or surgical decompression via trans mastoid approach. Result: Most common age group involved was the young adolescents (20-30years) who are more prone to RTA and traumatic injuries. Numbers of males affected were more than females in our study. Tympanic segment of facial nerve was found to be involved in maximum number of patients. Patients with transverse fracture of temporal bone causing immediate posttraumatic facial palsy were found to have better prognosis with surgical decompression. Patients with longitudinal fracture of temporal bone can go for either conservative management or if no improvement found within 7days were taken for surgical decompression of facial nerve via trans mastoid approach. Most of the patients who were managed surgically were found to have better prognosis according to this study. Conclusion: We draw the conclusion from our study that early diagnosis and surgical intervention significantly improved prognosis for immediate facial palsy following trauma. The trans mastoid approach for facial nerve decompression can be utilized when trauma is clearly localized to the tympanic or mastoid segment of facial nerve. Transverse fracture of temporal bone should be always treated with immediate surgical decompression and in longitudinal fractures both conservative and surgical management plays an important role. Appropriate post-operative management with oral steroids and physiotherapy plays an important role in traumatic facial nerve palsy. [AK Natl J Integr Res Med, 2023; 14(4):11-15, Published on Dated: 8/07/2023]

Key Words: Post Traumatic Facial Nerve Palsy, Trans Mastoid Approach, RTA, Tympanic Segment, Mastoid Segment

Author for correspondence: Dr. Annapoorna K, Second Year Resident Doctor, Department Of Otorhinolaryngology And Head And Neck Surgery, Government Medical College, Bhavnagar, And Sir T Hospital, Bhavnagar-364001. E-Mail: annapoornamanohar9@gmail.com Mobile: 8606616465

Introduction: Facial nerve palsy following trauma, is an uncommon condition which occurs in 1.5% patients of skull base fractures, majority of them due to road traffic accidents causing temporal bone fractures. Other causes include facial injuries by gunshot wounds (often found in urban areas), and iatrogenic injuries from ear surgeries and other head and neck surgeries. Stretching, compression, and transection of the nerve are the main modes of injury[1]. Temporal bone fractures are generally classified into longitudinal, transverse, and mixed fractures with respect to long axis of petrous bone. Longitudinal fractures are more common than transverse

fractures. In Longitudinal fractures, fracture line passes through external auditory canal and rarely involves otic capsule or transect facial nerve.

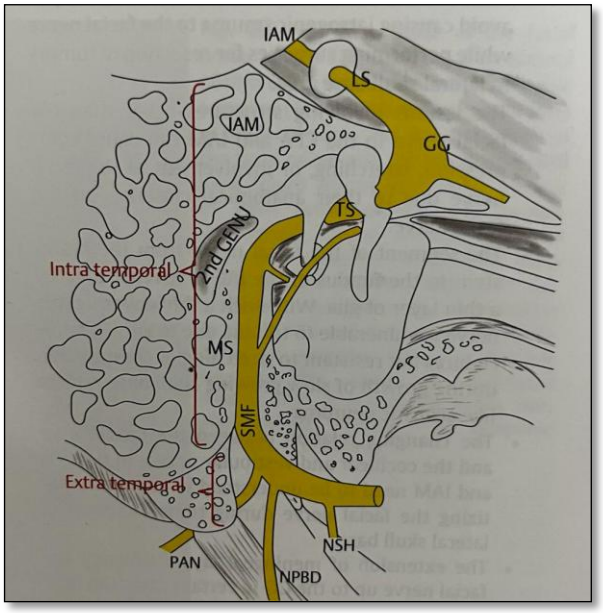
Transverse fractures usually occur in occipital to frontal trauma and fracture line runs perpendicular to long axis of the petrous bone; with 1st genu / labyrinthine segment to be most involved leading to sensorineural hearing loss[7].

Facial nerve, 7th cranial nerve, embryologically develops from second branchial arch is a mixed nerve. It has intracranial, intratemporal and extratemporal parts. Fibres from motor nucleus in pons hook around 6th cranial nerve nucleus and come out at cerebellopontine angle. The motor fibres of cranial nerve VII are joined by those of the nervus intermedius before entering the temporal bone through the internal auditory meatus.

The narrowest segment of the intratemporal facial nerve, the labyrinthine segment, extends from the internal auditory meatus to the geniculate ganglion, where the cell bodies of special visceral afferent neurons carrying taste from the anterior two- thirds of the tongue are located.

Facial nerve enters middle ear behind processes cochleariform is and it is at this site of bending geniculate ganglion is located. It is at the geniculate where the nervus intermedius joins the facial nerve proper, and the greater superficial petrosal and lesser petrosal nerve exit the facial nerve[4].

Figure1: Anatomy Of Facial Nerve



*Credits- Atlas Of Facial Nerve Surgeries And Reanimation Procedures By Dr. Madhuri Mehta)[6].

The tympanic segment of the nerve extends from the geniculate ganglion to the second genu, where the facial nerve turns inferiorly, transitioning to the vertical or mastoid segment.

Bony dehiscence is most common in the tympanic segment, in the area immediately adjacent to the oval window. The nerve to the stapedius and the chorda tympani can be found exiting the vertical segment. The nerve exits the temporal bone through the stylomastoid foramen, yielding the extratemporal portion of the nerve, which proceeds to innervate all muscles of facial expression.

The facial nerve then enters the parotid gland, where the main trunk branches into: the temporal, zygomatic, buccal, marginal mandibular, and cervical divisions (pes anserinus).

Of all the cranial nerves, the facial nerve is most susceptible to injury due to its long course within the skull as facial nerve is the only nerve which travels through bony canal hence is prone to fracture of bony canal and edema of nerve within the canal causing compression of facial nerve.

Early diagnosis and intervention of facial nerve injuries is essential for better prognosis[3]. Thorough clinical history, physical examination, and radiological studies are used to make the diagnosis of facial palsy. Treatment of facial nerve injury depends on onset of facial weakness and extent of facial weakness.

Facial nerve decompression via trans mastoid approach is suitable for patients whose nerve injury lies distal to geniculate ganglion and in all cases transverse fractures causing transection of facial nerve[5].

Indication and timing of facial nerve decompression for facial paralysis and anatomical extent of decompression has been a subject of controversy for years. The aim of this study is to present prospective review of 10 patients with immediate facial paralysis after trauma that underwent either surgical decompression of facial nerve via trans mastoid approach or conservative management (Injectable steroids with facial physiotherapy).

Objectives: To know age and sex wise distribution of immediate facial nerve palsy following trauma and to know most common grade of presentation according to H-B scale and most common type of temporal bone fracture and segment of facial nerve involved. To study outcome (within 1 month) of various modes of management of immediate posttraumatic facial nerve palsy.

Material & Methods: After approval from ethics committee, this prospective cross-sectional study was carried out in 10 patients presented with facial nerve palsy due to trauma at ENT department of Sir T Hospital, Bhavnagar over a period of 1 year from July 2022 to June 2023.

After taking consent, proper history was taken and time of RTA and time of presentation at ENT OPD was separately noted. Patients were examined and graded using House and Brackman grading system[2]. All the patients were evaluated and treated either by conservative management (Injectable steroids with facial physiotherapy) or surgical decompression via trans mastoid approach.

Inclusion Criteria: Inclusion criteria were immediate facial nerve palsy caused by trauma.

Exclusion Criteria: Exclusion criteria were all other causes of facial nerve palsy, posttraumatic delayed onset facial nerve palsy and patients with associated sensorineural hearing loss were excluded from the study.

Results: Results are as follows.

Table 1: Age Wise Distribution Of Posttraumatic Facial Nerve Palsy

Age Groups	Number Of Cases	Percentage
0-10	0	0
10-20	1	10
20-30	5	50
30-40	3	30
40-50	1	10
50-60	0	0
Total	10	100

Most common age group involved is 20-30 years.

Table2: Sex Wise Distribution

Sex	Number Of Cases	Percentage
Male	9	90
Female	1	10
Total	10	100

Males are more commonly involved than females.

Table3: H-B Grading Distribution Of Patients Preoperatively

H-B Grading	Number Of Cases	Percentage
Grade 1	0	0
Grade 2	0	0
Grade 3	2	20
Grade 4	3	30
Grade 5	4	40
Grade 6	1	10
Total	10	100

Most of the patients presented with grade 5 facial palsy.

Table 4: Distribution Of Segment Of Facial Nerve Involved

Segment Of Facial Nerve Involved	Number Of Cases	Percentage
Tympanic	8	80
Mastoid	1	10
Labyrinthine	1	10
1st Genu	0	0
2nd Genu	0	0
Total	10	100

Most common segment involved is the tympanic segment.

Table 5: Type Of Temporal Bone Fracture

Type Of Temporal Bone Fracture	Number Of Patients	Percentage Of Patients
Longitudinal	6	60%
Transverse	4	40%
Total	10	100%

Longitudinal fractures are more common than transverse fractures.

Table6: Mode Of Management

Mode Of Management	Number Of Cases	Percentage
Conservative (Longitudinal Fracture)	2	20
Surgical	8	80
Total	10	100

Maximum number of patients was managed surgically.

Improvement was seen maximum in patient managed surgically (Trans mastoid facial nerve decompression with post op facial physiotherapy) in transverse fractures (Table 7).

Table 7: Outcome

Outcome (With In 1month)	Improved (No. Of Cases)	Not Improved (No. Of. Cases)
Conservative (Longitudinal Fracture)	2	0
Surgical		
1.Longitudinal	4	0
2. Transverse	3	1
Total	9	1

Discussion: Prognosis of facial nerve decompression depends upon various factors including[6]:

1. Time of onset -immediate /delayed.
2. Degree of facial paralysis.
3. Type of fracture.
4. Time of 1st visit to otologist.
5. Associated with hearing loss/vertigo.

Number of males were more than females in our study which was like the study done by Yadav et al[4]. Most common age group involved was the young adolescents (20-30years) who are more prone to RTA and traumatic injuries. Tympanic segment of facial nerve was found to be involved in maximum number of patients i.e., 8out of 10 patients. Longitudinal fractures of temporal bone were found to be more common than transverse fractures as given in Atlas of facial nerve surgeries and reanimation procedures by Dr. Madhuri Mehta[6] and in Glasscock- Schambaugh[7].

In cases with immediate complete posttraumatic facial palsy with HRCT temporal bone showing transverse fracture surgical treatment is the only treatment and should be performed as early as possible[7]. In other cases, where there is immediate but incomplete facial palsy with longitudinal fracture line in temporal bone, patients can be initially put on steroids for few days and if no improvement occurs, can be taken for trans mastoid approach of facial nerve decompression.

Figure 2: Exposed Vertical Segment Of Facial Nerve

Conclusion: We draw the conclusion from our study that early diagnosis and surgical intervention significantly improved prognosis for facial palsy following trauma. The trans mastoid approach for facial nerve decompression can be utilized when trauma is clearly localized to the tympanic or mastoid segment of facial nerve.

Transverse fracture of temporal bone should be always treated with immediate surgical decompression and in longitudinal fractures both conservative and surgical management plays an important role. Appropriate post-operative management with oral steroids and physiotherapy plays an important role in traumatic facial nerve palsy.

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