DOI: 10.7860/JCDR/2015/11255.5841

Case Report

Surgery Section

Post Traumatic Delayed Bilateral Facial Nerve Palsy (FNP): Diagnostic Dilemma of Expressionless Face

RAKESH KUMAR[1], RADHEY SHYAM MITTAL[2]

ABSTRACT

Bilateral facial nerve palsy [FNP] is a rare condition. Mostly it is idiopathic. Post traumatic bilateral FNP is even more rare and having unique neurosurgical considerations. Post traumatic delayed presentation of bilateral FNP is socially debilitating and also having diagnostic challenge. Due to lack of facial asymmetry as present in unilateral facial paralysis, it is difficult to recognize. We are presenting a case of delayed onset bilateral FNP who developed FNP after 12 days of head injury with a brief discussion of its diagnostic dilemma and management along with literature review.

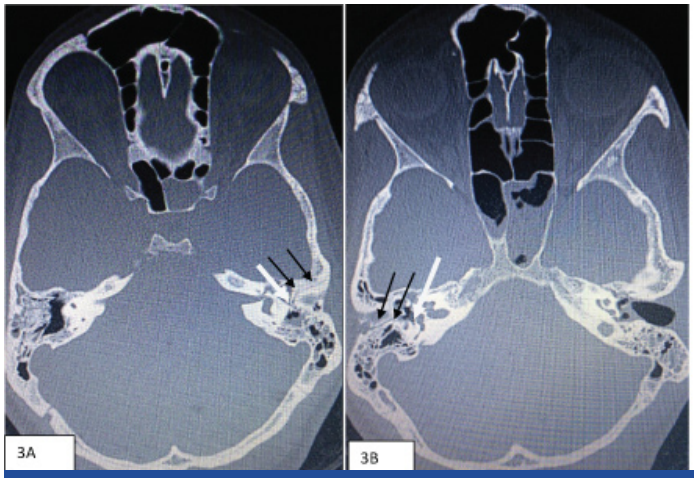
Keywords: Facial paralysis, Temporal bone fracture

CASE REPORT

A 22-year-old female admitted as a case of head injury due to road traffic accident. Patient had history of single episode of vomiting with bilateral ear bleed without any history of loss of consciousness or convulsion. Patient was conscious oriented without any neurological deficit. Her vitals were normal. On routine CT head right temporal and parietal bone fracture with underlying thin parietal extradural hematoma was present. There was tiny left surface temporal contusion with diffuse pneumocephalous [Table/Fig-1]. Patient was managed conservatively and discharged on third day. There was neither CSF otorrhoea nor any neurological deficit. Ten days after discharge patient presented with complain of incomplete closure of both eyes with drooling during a feed and having difficulty in moving his lips. Patient was afebrile without any sign of meningitis. She had difficulty in moving her lips while attempting to talk or chew. Her facial expression was symmetric without any emotional response. Neurological examinations revealed bilateral lower motor neuron facial palsy House/Brackmann grade 5. She had impaired lacrimation in left eyes and taste disturbance in left anterior 2/3 of tongue. Her hearing and facial sensation was normal. Schirmer's test was impaired in left eye and audiometry was normal in both ears. The diagnosis of bilateral facial paralysis was made based on the history and neurological examinations [Table/Fig-2a-c]. Electro diagnostic testing confirmed the diagnosis of bilateral facial paralysis.

CT head with HRCT temporal bone was done. HRCT temporal bone reveals longitudinal fracture of squamous and petrous part of right temporal bone involving anterior margin of middle ear cavity reaching upto lateral margin of meatal segment of facial nerve canal [Table/Fig-3a], and longitudinal fracture of squamous and petrous part of left temporal bone with fracture line extending in anterior part of middle ear cavity and involving meatal segment of facial nerve canal [Table/Fig-3b]. Patient was managed conservatively with systemic antibiotics and tablet acetazolamide 250 mg tid. Systemic steroid (prednisolone) was given and tapered gradually within three days. Then oral steroid was started and dose tapered gradually. Her eyes were closed with a patch and ciprofloxacin eye drops with artificial tear drop were prescribed. Otorrhoea stopped by day third and right side facial weakness improved. The patient was discharged after seven days on oral medication with advised physiotherapy to the facial muscles. On follow up of two months weakness on right side of the face had improved to House/ Brackmann grade 2 and on left side the weakness of grade 4 is present [Table/Fig-2b].On last follow up of four months her left side facial weakness also improved to grade 2 [Table/Fig-2c].

[Table/Fig-1]: NCCT head showing right temporal and parietal bone fracture with underlying thin parietal extradural hematoma. There was tiny left surface temporal contusion with diffuse pneumocephalous **[Table/Fig-2a-c]:** Patient photographs at the time of diagnosis (2a), after two months (2b) and four months (2c) follow up



[Table/Fig-3a,b]: HRCT temporal bone reveals longitudinal fracture of squamous and petrous part of right temporal bone (⟶) involving anterior margin of middle ear cavity reaching upto lateral margin of meatal segment of facial nerve canal (⟶) [3a], and also having longitudinal fracture of squamous & petrous part of left temporal bone (⟶) with fracture line extending in anterior part of middle ear cavity and involving meatal segment of facial nerve canal (⟶) [3b]

DISCUSSION

Bilateral FNP is quite rare with an incidence of 1 per 5,000,000 populations [1]. It represents less than 2% of all FNP. Head injuries is responsible for about 5 per cent of all cases facial paralysis [2,3]. The facial nerve is the second most common cranial nerve, after Olfactory nerve, involved in head injuries [4], while some authors report it to be the most common [5]. Trauma is the second most common identifiable cause of facial nerve paralysis. Temporal bone fracture is a well-known cause of facial paralysis, and is responsible for approximately 3 per cent of bilateral facial Paralysis [2]. Unilateral FNP is more common with transverse fractures (40-50%), and less with longitudinal fractures (20%). De Villiers (1971) proposed that the longitudinal fracture of petrous part of temporal bone can lead to backward displacement of the petrous apex and coronal splitting of the body of sphenoid leading to mirror image fracture in the opposite temporal bone producing bilateral FNP, while a transverse fracture of the petrous bone will not involve bilateral facial nerves [6]. A possible explanation of delayed FNP is either the bleeding into the facial Canal with increasing size of hematoma or delayed swelling of the nerve leading to compression within its fibrous sheath or epineurium [7].The early diagnosis of bilateral facial paralysis in the traumatic brain injury can be particularly challenging due to lack of facial asymmetry. All patients with bilateral facial paralysis should be thoroughly evaluated. A through history, complete physical and neurological examination along with Schirmer's and electro diagnostic tests are the most important aspect of the evaluation in the diagnosis of bilateral facial paralysis.

EMG confirms the presence of a demyelinating neuropathy affecting both facial nerves and is also helpful in determining the prognosis [8]. High resolution computed tomography (HRCT) 1mm thin cuts of temporal bone is a useful diagnostic tool for traumatic FNP, as it can visualize the fracture line and its relationship to the Fallopian canal [9].

MR imaging with contrast can reveal inflammatory facial nerve lesions and traumatic nerve injury. Enhancement of the distal intrameatal and labyrinthine segments is specific for FNP [10]. Conservative management with steroids and vasodilators are recommended for patients with delayed onset facial weakness or incomplete facial weakness. In cases of non-recovery or within six months after trauma late surgery may be recommended [9].The surgical approach depends on the site of the injury to the nerve and hearing status. Middle fossa approach is used to decompress the Nerve in the temporal bone in patients with intact hearing. Translabyrinthine approach can also be used in presence of hearing impairment. Nerve must be fully exposed during exploration to identify all injured segments and removal of any fracture fragments coursing compression. Direct end-to-end anastomosis should be performed in presence of complete transection of the nerve [7]. The prognosis for bilateral facial paralysis depends upon the underlying aetiology and having excellent prognosis in presence of identifiable cause.

CONCLUSION

Traumatic delayed bilateral FNP is a rare clinical entity. Due to lack of facial asymmetry as in unilateral facial paralysis, Bilateral FNP is also a diagnostic challenge. A through history with complete physical and neurological examination along with electro diagnostic tests is mandatory to diagnose the bilateral facial paralysis. HRCT 1 mm thin cuts of temporal bone and contrast MRI are the important diagnostic tools with prognostic values.

ACKNOWLEDGEMENT

We acknowledge our patient for giving his consent to publish this matter.

REFERENCES

[1] Keane JR. Bilateral seventh nerve palsy: analysis of 43 cases and review of the literature. *Neurology*. 1994;44:1198-202.
[2] Li J, Goldberg G, Munin MC, Wagner A, Zafonte R. Posttraumatic bilateral facial palsy: A case report and literature review. *Brain Injury*. 2004;18;315-20.
[3] Steenerson L. Bilateral facial paralysis. *Am J Otolaryngology*. 1986;7:99-103.
[4] Coello AF, Canals AG, Gonzalez JM, Martín JJ. Cranial nerve injury after minor head trauma. *J Neurosurg*. 2010;113(3):547-55.
[5] Haberkamp TJ, Harvey SA, Daniels DL. The use of gadolinium-enhanced magnetic resonance imaging to determine lesion site in traumatic facial paralysis. *Laryngoscope*. 1990,100:1294-300.
[6] De Villiers JC. Fracture-dislocation of the petrous temporal bone. *J Neurol Neurosurg Psychiatr*. 1971;34:104-09.
[7] Sundar IV, Kurmi DV, Rao K, Sharma V, Chopra S, Jain SK. Delayed onset post-traumatic bilateral facial nerve paralysis: A rare case report. *Indian Journal of Neurotrauma*. 2012;9:143-46.
[8] Sertac Y. Total facial nerve decompression for severe traumatic facial nerve paralysis: a review of 10 cases. *Int J Otolaryngol*. 2012:5. http://dx.doi.org/10.1155/2012/607359.Article ID 607359.
[9] Darrouzet V, Duclos JY, Liguoro D, Truilhe Y, De Bonfils C, Bebear JP. Management of facial paralysis resulting from temporal bone fractures: our experience in 115 cases. *Otolaryngol Head Neck Surg*. 2001;125:77-84.
[10] Kinoshita T, Ishii K, Okitsu T, Okudera T, Ogawa T: Facial nerve palsy: Evaluation by contrast-enhanced MR imaging. *Clinical Radiology*. 2001; 56:926-32.

PARTICULARS OF CONTRIBUTORS:
1. Senior Resident, Department of Neurosurgery, Sawai Man Singh Medical College, Jaipur, Rajasthan, India.
2. Professor and Head, Department of Neurosurgery, Sawai Man Singh Medical College, Jaipur, Rajasthan, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Rakesh Kumar,
Mailing Address – 4-KH-2, Jain Nursing Home, Housing Board,
Shastri Nagar, Jaipur, Rajasthan-302016, India.
E-mail : rksingh2226@gmail.com, dr_mittal@hotmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Sep 14, 2014**
Date of Peer Review: **Dec 27, 2015**
Date of Acceptance: **Feb 11, 2015**
Date of Publishing: **Apr 01, 2015**