

Role of Electrical Stimulation of Palate in Patients of Lateral Medullary Syndrome with Dysphagia

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Abstract

Lateral Medullary Syndrome is due to involvement of lateral wedge of medulla by vascular insult. Motor weakness is not a feature of these cases. Involvement of palatal and laryngeal muscles results in difficulty in feeding and phonation. Patients are usually sent to the Department of Physical Medicine with complaint of dysphagia and nasal intonation and usually on naso-gastric tube feeding. Two such cases were studied in Dept of Physical Medicine, Medical College Hospital, Kolkata between 1997 and 2004. Noticeable improvement was noticed with electrical stimulation of palate. No literature could be found. The above studies showed that electrical stimulation of palate may be tried in lateral medullary syndrome to hasten improvement of palatal weakness, when present. This will help early oral feeding and early socialization of the patient.

Introduction

Lateral Medullary syndrome is not uncommon and cases are usually referred from the departments of Neuromedicine or General Medicine to the department of Physical Medicine for the rehabilitation of the patient. Lateral Medullary Syndrome is due to infarction in the lateral wedge of medulla. Lateral Medullary Syndrome may be total or partial depending on the involvement of vessels supplying lateral medulla. The patients show combined features of involvement of multiple cranial nerve nuclei, cerebellum, ascending and descending tracts. Dysphagia and nasal intonation may be present due to palatal and laryngeal palsy. When present, dysphagia and nasal intonation may be annoying and cause psychological burden to the patients.

The present study was conducted in the department of Physical Medicine & Rehabilitation, Medical College

Hospital, Kolkata to ascertain role of electrical stimulation of palate in patients of Lateral Medullary Syndrome dysphagia. Palatal exercise was done along with electrical stimulation of palate. Two cases were selected. First case was treated in 1997 and second one was treated in 2004. In both cases marked improvement was observed so far as palatal function is concerned. Nasogastric tube feeding could be discontinued in both cases within short time after starting stimulation of palate with galvanic current. Psychological improvement was also perceived.

Case 1

A 42 years old Hindu male, resident of Kolkata, was admitted to the Department of Neuromedicine, Medical College Hospital, Kolkata on 21.07.1997 with chief complaints of nasal intonation, nasal regurgitation, difficulties in deglutition of solid and liquid foods. There was feeling of numbness on the left side of the body from neck downwards.

The entire episode started suddenly on 19.06.1997 as electrical shock like sensation over right occipito-parietal

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region along with choking sensation in the throat and total picture was revealed within 24 hours.

There was no history of unconsciousness, motor weakness in limbs, vertigo, tinnitus, difficulties in vision and hearing and loss of taste sensation. Bowel and bladder control was normal.

Patient was a known hypertensive for 15 years and was on antihypertensives. He was a chronic smoker (5-6 cigarette/day) but non alcoholic. He was on fabrication job in heavy industry requiring exposure to high temperature.

Initial examination in Department of Neuromedicine on 21.06.1997 showed pulse 60/minute, regular; B.P 150/100 mm. of Hg.; right sided palatal palsy, right sided laryngeal palsy, right miosis, left sided (from neck downwards) hemi-anaesthesia for pain and temperature sensation. Joint, vibration and cortical sensation were intact. There was no motor weakness of the limbs. Ophthalmic examination was normal. The case was provisionally diagnosed as Lateral Medullary Syndrome (Incomplete). Biochemical examination and CT scan of brain was normal. The patient was put on Nasogastric tube feeding .

The patient was referred to Department of Physical Medicine on 23.07.1997, about one month after admission in the Department of Neuromedicine.

On examination, the patient was found to be depressed and his main concern was feeding through nasogastric tube and his persistent nasal indistinct intonation which forbade him from proper communication and socialization.

With palatal exercises, electrical stimulation of soft palate was started. Palate was stimulated regularly for 15 minutes with galvanic current.

The patient showed gradual improvement. Gradual introduction of solid food through mouth (with nasogastric tube in place) was started from 1.08.1997 and nasogastric tube feeding was discontinued on 7.08.1997.

Electrical stimulation of palate was then discontinued, but palatal exercise was continued.

On 8.08.1997, the patient showed slight right sided palatal palsy, sluggish movement of right vocal cord and persistent numbness of left side of the body. No nasal intonation was noted. Patient was discharged on 19.08.1997 in a favourable condition with the advice of continuation of palatal exercises.

Follow-up on 30.08.1997 showed that the patient was cheerful and happy. He was doing regular palatal exercises. On examination, mild right sided palatal sluggishness with left sided sensory impairment of the body was found to be still persisting.

Case2

A 55 years old Hindu male, resident of Kolkata, was admitted in the Department of General Medicine, Medical College Hospital, Kolkata on 3.02.2004 with the chief complaints of difficulty in speech and deglutition along with choking sensation on the right side of the throat. The same evening the patient suffered from sudden onset of severe vertigo. To get relief, he sat down and then lay on the floor. But vertigo continued. As per advice of local physician the same evening he was transferred to emergency of Medical College Hospital, Kolkata. At the time of transfer his B.P was found to be 170/110 mm Hg.

On his way to hospital, the patient lost consciousness. On regaining consciousness in the Emergency Medicine ward of the Medical College Hospital in the same night, the patient noticed difficulty in speech and deglutition along with choking sensation on the right side of the throat. Annoying hiccough started late in the night disturbing his respiration. The patient was unable to walk due to disturbance of balance.

On the 10th day of hospital stay, loss of temperature sensation was noticed on the left half of the body. Tactile sensation was also less on the left side. History of convulsion, disturbances of vision, hearing and taste sensation or tinnitus or headache were lacking. No motor loss of the limbs was noticed. Bowel and bladder control was normal. The Patient was a known hypertensive and under regular medication. He was an order supplier in printing press.

On initial examination, the patient was found to be alert, co-operative and anxious. His B.P. was 94/74 mm of Hg. There was 9th and 10th cranial nerve palsy. There was loss of temperature sensation with some loss of tactile sensation on the left half of the body. Joint, vibration and cortical sensation were found to be intact. The case was provisionally diagnosed as Lateral Medullary Syndrome (Incomplete).

Biochemical examinations were normal. CT scan of brain showed features of mild brain shrinkage with low attenuating areas in paraventricular areas. MRI of brain showed mild cerebral atrophic changes with multiple small hyperintensity in subcortical parieto-frontal region bilaterally likely of focal demyelination. A small hyperintensity in right anterior putaminal region was found, suggestive of a lacunar infarct. The right side of medulla showed focal hyperintense area likely to be an infarct.

The patient was put on nasogastric tube feeding along with other medicinal treatment. The patient was in Department of General Medicine for 22 days and then transferred to Department of Neuromedicine for further management. The patient was then transferred to

Department of Physical Medicine. On his first visit to the Department of Physical Medicine, the main complaints of the patient were nasal intonation and difficulty in deglutition. Patient was still in nasogastric tube feeding. On examination, there was right sided palatal palsy, right sided laryngeal palsy along with loss of temperature sensation and partial loss of tactile sensation of left half of the body.

With usual care for sensory loss and palatal exercises, electrical stimulation of the palate was done regularly for 15 minutes with galvanic current. Within 5 days of palatal stimulation, much improvement of dysphagia was noted. The patient was able to take even liquid with some nasal regurgitation. The nasogastric tube was removed. The electrical stimulation was continued for 2 weeks. Patient was discharged with some nasal intonation but without any deglutition problem. Sensory deficiency was persistent at the time of discharge of the patient. Patient was advised to continue palatal exercises.

Discussion

Lateral Medullary Syndrome is due to involvement of vertebro-basilar system of arteries. The two vertebral arteries join to form basilar artery at the junction of medulla and pons. The basilar artery then divides into two posterior cerebral arteries to contribute to circle of Willis at the

level of upper midbrain. Together, vertebral and basilar arteries supply the brainstem by paramedian and short circumferential branches and supply the cerebellum by long circumferential branches¹. Lateral medullary syndrome is due to occlusion of any of the five vessels-vertebral; posterior inferior cerebellar; superior, middle, or inferior lateral medullary arteries². Lateral Medullary Syndrome is most often caused by occlusion of the intracranial segment of the vertebral artery. Less commonly it is caused by occlusion of posterior inferior cerebellar artery ³. In Lateral Medullary Syndrome infarction in the lateral wedge of medulla occurs⁴. Lateral medullary syndrome is also known as the Wallenberg syndrome as it was first described Wallenberg in 1895 ⁴. Depending on the involvement of area of medulla, it may be complete or partial. In our study both cases were Incomplete Lateral Medullary Syndrome. Features of complete lateral medullary syndrome are as follows ⁴.

In above two patients studied, the main concern of the patient was difficulty in deglutition and nasal intonation. Due to difficulty in deglutition and nasal regurgitation during oral feeding, patients were put on nasogastric tube feeding. As a result of nasal intonation patients could not produce distinct audible sound during communication. Combined effect of these two factors prevents socialization of the patients. As a result of this the first

A. On the side of the lesion	
Signs and Symptoms	Structure involved
Pain, Numbness, impaired sensation over half of the face	Descending tract and nucleus of 5 th cranial nerve
Ataxia of the limb and falling to the side of the lesion	Uncertain- restiform body, cerebellar hemisphere, olivocerebellar fibres, spinocerebellar tract.
Vertigo, nausea, vomiting	Vestibular nucleus and connection
Nystagmus, diplopia, oscillopsia	Vestibular nucleus and connection
Horner syndrome (miosis, ptosis, decreased sweating)	Descending sympathetic tract
Dysphagia, hoarseness, paralysis of vocal cord, diminished gag reflex	Issuing fibre of 9 th & 10 th cranial nerves
Loss of taste (rare)	nucleus of tractus solitarius. ?
Numbness of ipsilateral arm, trunk or leg	Cuneate and gracile nucleus
Hiccup	Uncertain

B. On the opposite side of the lesion	
Signs and Symptoms	Structure involved
Impaired pain and thermal sense over half of the body, sometimes face	Spinothalamic tract

patient became depressed and irritable. Following electrical stimulation of the palate along with palatal exercise, both patients showed rapid improvement. In the first patient nasogastric tube could be removed after about 2 weeks and in case of second patient nasogastric tube was removed within one week. No literature could be found regarding electrical stimulation of palate in patient of Lateral Medullary Syndrome with dysphagia. Dysphonia was corrected probably due to stimulation of larynx during stimulation of palate.

Summary and Conclusion

In the first case studied, we found that the patient is depressed and irritable during his first visit to the Department of Physical Medicine. Within a few days of electrical stimulation of the palate his disabilities disappeared appreciably. There was dramatic change of the mood of the patient and he became cheerful and happy.

In the second case, the patient was on nasogastric tube feeding for about one month. But after only 5 days of electrical stimulation of the palate, patient improved so much that oral feeding could be started.

From the experience of above two cases, it can be said that electrical stimulation of palate has probably got some

role to hasten recovery of the patient so far as palatal function is concerned. Only two cases were studied. Before coming to a firm conclusion more cases should be studied. If repeated studies show that electrical stimulation of palate has definite role in improvement of palatal function in patient of Lateral Medullary Syndrome, then along with usual physiotherapeutic management electrical stimulation of palate with galvanic current could be added to the treatment protocol of Lateral Medullary Syndrome with dysphagia.

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