***Case report***

Bulbar Palsy as a presentation of Medullary Ischemic Stroke leads to diagnostic and management dilemma: An educational case report.

**ABSTRACT:**

|  |
| --- |
| **Aims:** Medullary ischemic strokes are uncommon and often present with complex neurological symptoms. The clinical characteristics of bulbar palsy, which can be a common presentation for other diseases, add to the difficulties in diagnosing and treating such cases. The primary aim of documenting this case is to highlight the diagnostic and management challenges of this complex presentation.  **Presentation of case:** We report a case of a 45-year-old male with a personal history of long-term smoking and alcoholism, who experienced tongue deviation, difficulty swallowing, dystonia, and epigastric pain. Magnetic resonance imaging confirmed an acute medullary infarct without hemiparesis. The patient was managed with non-pharmacological and pharmacological therapy, and the patient showed gradual improvement in symptoms throughout admission.  **Discussion:** The patient presentation mimicked bulbar palsy but imaging and cranial nerve examinations helped in accurate diagnosis and treatment.  **Conclusion:** This case highlights the importance of early neuroimaging in atypical clinical presentation. It also signifies the complexities in the diagnosis and management of medullary strokes presenting with bulbar palsy features. |

***Keywords:*** *Bulbar palsy, Hemibulbar syndrome, Medullary ischemic stroke, Cranial nerve involvement, Case report*

1. **INTRODUCTION:**

Ischemic stroke refers to the clinical condition where the supply of blood to the brain is restricted due to narrowing or blockage of the arteries supplying the brain. It can lead to localized brain ischemia, hypoxic damage and other related neurological impairments [1]. Worldwide, more than 80 million people are affected by stroke, where 70% present with an ischemic nature [2[. Strokes in the posterior region involve 20-25% of people affected by ischemic and medullary infarctions, though rare, it represent a significant clinical subset [3].

The medullary infarctions may affect the cranial nerves IX (Glossopharyngeal nerve), X (Vagus nerve), XI (Spinal accessory nerve), and XII (Hypoglossal nerve), resulting in a lower motor neuron disorder called bulbar palsy. The term “bulb” historically refers to the medulla oblongata [4, 5].

The bulbar palsy is further categorised into lateral, medial and hemibulbar syndrome based on the specific anatomical site affected by infarction and the involvement of particular cranial nerves [5].

This case offers valuable educational insights regarding presentations of brainstem stroke, rare complications, cranial nerves involvement, diagnostic difficulties and approaches of pharmacological management.

1. **CASE PRESENTATION:**

A 45-year-old male patient presented to the emergency department with complaints of sudden mouth deviation to the right side and epigastric pain that radiated to the back, since the previous night. The patient also mentions a history of difficulty in swallowing (dysphagia), pain in the throat, nasal regurgitation of liquids, slurred speech (dysarthria) and hoarseness of voice for the past two weeks.

The patient has a personal history of chronic alcohol consumption and long-term smoking. His reported last intake of alcohol was the previous night before the occurrence of the deviation of the mouth.

On examination, the patient was conscious, oriented and did not have fever. Discomfort was observed when the patient tried to move his neck. His blood pressure was 140/90 mmHg, and his pulse rate was 115 beats per minute. Both ears showed chronic perforation of the tympanic membrane with mucus discharge.

Neurological assessment revealed dysphonia, nasal speech and an intact gag reflex. Even though the gag reflex was intact, occasional nasal regurgitation of feeds was also present. There was tongue deviation to the left side without tongue fasciculation. Cranial nerve testing confirmed involvement of cranial nerves IX, X, XI, and XII. Cranial nerves I, II, III, IV, V, VI, VII and VIII are mentioned as normal. No vertigo or nystagmus was noted. The motor reflex was normal.

Routine laboratory investigations are within normal range. There was no evidence of hepatic or renal dysfunction. The results of the electrocardiogram were normal.

A clinical diagnosis of bulbar palsy was made. The pattern of tongue deviation and dysphagia raised suspicion of hemi-medullary syndrome. Magnetic resonance imaging (MRI) reported an acute infarct in the medulla oblongata, confirming the diagnosis of medullary ischemic stroke. The patient was also diagnosed with complications like alcoholic gastritis, systemic hypertension and bilateral chronic suppurative otitis media.

The patient was managed with intravenous fluids, Tab. Aspirin 150mg orally in the afternoon, Tab. Atorvastatin 20mg orally at bedtime, Tab. Amlodipine 5mg orally in the morning, Tab. Enalapril 2.5mg orally twice a day. Counselling was given by the psychiatrist for cessation of alcohol consumption. Gastritis caused due to alcohol was managed by intravenous administration of pantoprazole 40mg once a day. Supportive treatment of thiamine 100mg in 100 mL of normal saline was administered as intravenous infusion. Amoxicillin and potassium clavulanate 1.2g were administered intravenously to the patient twice a day from Day 2 to Day 8.

Over the next twenty days, the patient was managed pharmacologically, and the patient showed gradual improvement in speech clarity and reduced nasal regurgitation. There were no new neurological deficits, and the overall clinical condition of the patient was stable. He was discharged with follow-up rehabilitation counselling sessions and stroke therapy.

1. **DISCUSSION:**

Medullary infarcts account for a small proportion of all ischemic strokes but often impose diagnostic and treatment challenges due to their nonspecific symptoms [3]. This case educationally represents the complexities arising during the diagnosis and the confusion arising during the therapy.

This case starts with the patient presenting with evident classical symptoms of bulbar palsy like, which could be a presentation for many diseases including dysarthria, dysphagia, hoarseness of voice, nasal speech, and deviation of tongue confirmed the diagnosis of bulbar palsy. The absence of emotional imbalance ruled out pseudo-bulbar palsy [4].

Bulbar palsy could be a common presentation for several diseases like amyotrophic lateral sclerosis, Guillain-Barré syndrome, Kennedy disease, syringobulbia, poliomyelitis, chronic meningitis, neoplasms, aneurysms or congenital abnormalities.

No visual presentation or history of congenital abnormalities is present in the patient [4, 6].

**Table 1: Reasons for ruling out the differential diagnosis [6, 7, 8, and 9].**

|  |  |
| --- | --- |
| **Differential Diagnosis** | **Reasons for ruling out the possibility** |
| Amyotrophic lateral sclerosis | Symptoms causing death of both upper and lower motor neurons were not observed. The patient’s symptoms are not chronic. |
| Gullian-Barré syndrome | Loss of sensation and muscle weakness are not noted in the patient. |
| Kennedy disease | No chronic progressive symptoms, no limb dysfunction noted. |
| Chronic meningitis | No abnormalities in MRI supporting chronic meningitis. No complaints of fever, focal deficit, headache, nausea and vomiting. |
| Syringobulbia | No fluid fill or syrinx is seen in the medulla on MRI. Diplopia, vertigo, loss of sense of temperature on one side of the face, palatal and vocal cord paralysis, and nystagmus were not seen. |
| Poliomyelitis | No history of polio virus or preceding febrile illness, no asymmetric flaccid limb paralysis or loss of deep tendon reflexes |

In this case, the patient presented with systemic hypertension and, history of long-term alcohol and tobacco use. All three of these factors would have contributed to the etiology of Ischemic brainstem stroke, and this was confirmed by the results of MRI, which showed an acute medullary infarct. MRI also ruled out aneurysm and a neoplastic cause of bulbar palsy [6].

Careful neurological examination was carried out to confirm the involvement of the cranial nerves. The cranial nerves, IX (Glossopharyngeal nerve), X (Vagus nerve), XI (Spinal accessory nerve), and XII (Hypoglossal nerve) arise from the medulla oblongata and impairment in all four of these nerves is noted.

The involvement of the glossopharyngeal nerve is observed by the patient’s complaint of difficulty in swallowing and pain in the throat. Dysphonia and dysphagia confirmed the impairment of the vagus nerve. Though weakness in head support is not seen, the patient complains of neck pain and discomfort in twisting the neck, suspecting spinal accessory nerve involvement. Slurred speech, tongue deviation to the left side are due to the impairment of the motor functions of the hypoglossal nerve [5].

Bulbar palsy is further classified into lateral, medial and hemibulbar syndrome [5].

**Table 2: Presence of Characteristic features of lateral and medial bulbar syndrome [5].**

|  |  |  |
| --- | --- | --- |
| **Syndrome** | **Characteristics** | **Status** |
| Lateral bulbar syndrome | Dysphonia  Dysphagia  Dysarthria | Present |
| Medial bulbar syndrome | Tongue deviation | Present |

Though hemiplegia, hemiparesis, nausea and vertigo are absent, the presence of characteristics from both lateral bulbar syndrome and medial bulbar syndrome raises suspicion for partial hemibulbar syndrome. Hemibulbar syndrome is also known as Babinski-Nageotte syndrome [7].

Tab. Aspirin 150mg in oral route once a day was prescribed to manage ischemic stroke. [8] Some conditions require dual antiplatelet therapy whereas some cases are managed with single antiplatelet therapy. [3] Tab. Atorvastatin 20mg oral administration during the night is given as a prophylaxis to reduce the risk of stroke by preventing atherosclerotic cardiovascular disease [9].

Hypertension management is recommended if it persists for more than two weeks, in this case, hypertension was managed by oral administration of the tablet Amlodipine 5mg once a day and Tab. Enalapril 2.5mg twice a day. Though this was a deviation from guidelines, patient showed significant improvement in real-life practice [8].

Inj. Thiamine 100mg in 100 mL normal saline is administered as intravenous infusion to the patient to achieve detoxification. Counselling from a psychiatrist was also given to provide non-pharmacological treatment to the patient. Cessation of alcohol was suggested [8].

Amoxicillin and potassium clavulanate 1.2g were administered intravenously to the patient twice a day for 7 days to manage chronic suppurative otitis media, whereas guidelines suggest oral administration of amoxicillin and clavulanic acid three times a day for 7 days [8].

This case highlights the diagnostic difficulties faced due to the insignificant symptoms of the patients. Though MRI guided the diagnosis of medullary infarct, the specific region was not documented. The involvement of cranial nerves examination helped in the diagnosis of hemibulbar palsy and ruled out differential diagnosis. Treatment dilemma in administering intravenous amoxicillin and potassium clavulanic acid 1.2mg three times a day; treating hypertension added educational value to this case report.

Limitations of the study includes lack of usage of tools to check the severity of the stroke. The damage occurred due to ischemic stroke or the recovery achieved was not quantified. As this case was diagnosed and treated in a rural area, the limitations of advanced equipment, financial restraints and advanced diagnostic procedures are also present. This report also limits the treatment follow-up to primary therapy, long term recovery was not documented. Advanced neuroimaging was not implied, lacking access to anatomical precision.

1. **CONCLUSION:**

This case adds to the limited literature on medullary ischemic stroke and hemibulbar syndrome involving the cranial nerves IX-XII without any specific motor dysfunction. It highlights the need to maintain suspicion for medullary infarct in patients presenting with bulbar symptoms. Early diagnosis, timely imaging and appropriate therapy in this patient helped in achieving therapeutic outcomes.

1. **CONSENT:**

Written informed consent was obtained from the participant for publication of this case and any accompanying clinical information.

1. **ETHICAL APPROVAL:**

Institutional ethical committee approval for anonymized single case report is exempted at our institution.

1. **REFERENCES:**
2. Zeng, H., Zhao, W., Wu, J., Wei, J., Li, H., Wang, L., & Zeng, X. (2024). Effect of intermittent oro-oesophageal tube feeding in bulbar palsy after ischaemic stroke: a randomised controlled study. *Stroke*, 55, 1142-1150.
3. Phipps, M. S., & Cronin, C. A. (2020). Management of acute ischaemic stroke. *BMJ*, 368, l6983.
4. Muhammad, A., Ali, L., Hussain, S., Zafar, A., Own, A., Naqvi, S. G., & Haroon, K. H. (2023). An in-depth analysis of medullary strokes at a tertiary care stroke center: Incidence, clinical and radiological characteristics, etiology, treatment, and prognosis. *Cureus,* 15(8), e43017. <https://doi.org/10.7759/cureus.43017>
5. Lai, E. C. (2016). Brain stem disease: Clinical anatomy of the brain stem. In Neurology Secrets (6th ed., pp. 141–156). Elsevier. <https://doi.org/10.1016/B978-0-323-05712-7.00009-X>
6. Jorquera Moya, M., Merino Menéndez, S., Porta Etessam, J., Escribano Vera, J., & Yus Fuertes, M. (2019). Cranial nerve disorders: Clinical manifestations and topography. *Radiología* (English Edition), 61(2), 99–123. <https://doi.org/10.1016/j.rx.2018.09.005>
7. Haag, A. (2025). Bulbar Palsy: What Is It, Causes, Diagnosis, Treatments, and More. *Osmosis.* Retrieved August 10, 2025, from <https://www.osmosis.org>
8. Baldwin, K. J., & Zunt, J. R. (2014). Evaluation and treatment of chronic meningitis. *The Neurohospitalist*, 4(4), 185-195. <https://doi.org/10.1177/1941874414533354>
9. “Syringobulbia.” (n.d.). *Physiopedia*. Edited by Shreya Pavaskar and Kim Jackson. Retrieved August 10, 2025, from <https://www.physio-pedia.com/Syringobulbia>
10. Mehndiratta, M. M., Mehndiratta, P., & Pande, R. (2014). Poliomyelitis: Historical facts, epidemiology, and current challenges in eradication. *The Neurohospitalist,* 4(4), 223-229. <https://doi.org/10.1177/1941874414533352>
11. Gowda, S. N., Munakomi, S., & De Jesus, O. (2025). Brainstem stroke. In *StatPearls* [Internet]. StatPearls Publishing. Updated February 25, 2024. NCBI Bookshelf. Bookshelf ID NBK560896. <https://www.ncbi.nlm.nih.gov/books/NBK560896>
12. Mossuto-Agatiello, L., & Kniahynicki, C. (1990). The hemimedullary syndrome: case report and review of the literature*. Journal of Neurology,* 237(3), 208-212. <https://doi.org/10.1007/BF00314596>
13. Government of India, Ministry of Health and Family Welfare. (2013). *Standard Treatment Guidelines* (1st ed.). Directorate General of Health Services, New Delhi.
14. Lexicomp. (2025). Atorvastatin: Drug information. In *Lexi-Drugs Online* [database on the Internet]. Wolters Kluwer Health. Retrieved August 3, 2025, from <https://www.uptodate.com/contents/atorvastatin-drug-information>