

Isolated Hypoglossal Nerve Palsy: A Case Report

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ABSTRACT

The hypoglossal nerve; XII cranial nerve, exit the skull through the hypoglossal canal which is the primary motor nerve responsible for the innervation of the intrinsic and extrinsic tongue muscles. Isolated hypoglossal nerve palsy is a rare clinical condition. It may have idiopathic cause and various secondary causes such as intracranial or extracranial space-occupying lesions, head and neck trauma, vascular abnormalities, infections, autoimmune disorders, or neuropathy. Here we present the case of an elderly male who attended the Outpatient Department with complaints of tongue deviation to the left side and slurred speech. This case underscores the importance of thorough investigation to ensure accurate diagnosis and optimal patient outcomes.

Keywords: Hypoglossal nerve; Nerve palsy.

INTRODUCTION

Hypoglossal nerve also known as cranial nerve XII is the motor nerve for tongue muscles. It consists of four branches: meningeal, descending, thyrothyroid, and muscular. The muscular branch is the general somatic efferent nerve which innervates all the intrinsic and extrinsic muscles except for the palatoglossus.¹ The nerve is responsible for tongue motion (protruding, retracting, depressing) along with swallowing, phonation, and respiration functions.² Isolated hypoglossal nerve palsy is a rare condition. It may be idiopathic and most of the time due to intracranial or extracranial space-occupying lesions, head and neck injury, vascular abnormality, infection, autoimmune disease, and neuropathy and can be an early manifestation of demyelinating disease.^{3,4}

Here we present a case of an elderly male who presented in the Outpatient department of Annapurna Neurological Institute and Allied sciences with complaints of deviation

of the tongue to the left side and slurred speech and was clinically diagnosed with isolated hypoglossal nerve palsy. Since isolated hypoglossal nerve palsy is a rare condition, we must try to find the secondary cause of the palsy.

CASE REPORT

A 64-year-old male with no known comorbidities presented in the Outpatient department with complaints of deviation of the tongue to the left side and slurred speech for ten days. There is no history of loss of consciousness, tongue bite, or teeth clenching. Three months back the patient had throat pain for which he had consulted a nearby hospital and was treated at another center for acute pharyngitis with antibiotics. The patient was symptomatically better at that time. After two months he developed neck pain more on the left side with the sensation of something stuck in his throat.

There was no history of dysphagia or slurring of speech. The patient sought consultation at another center where he was managed with symptomatic medications. MRI brain was done which showed nonspecific foci of demyelination. One week later the patient developed tongue deviation to the left side and slurred speech and arrived for the consultation.

On examination, the General condition of the patient was fair and well-oriented to person, place, and time. Vitals were normal. On physical examination: when the tongue was protracted and at rest it deviated to the left. When moving left to right and outside, normal movement was observed. (There was no fasciculations. There was no mass under the tongue, or mandible during palpation. Other cranial nerves examination was normal. The motor, sensory, and cerebellar examination was normal. His family history was unremarkable. Investigations showed: normal complete blood counts, liver function tests. Random blood sugar: within normal limits. Viral serology and VDRL tests were negative. CRP and ESR were raised 8.1 and 35mm respectively. Chest x-ray was normal with no features of hilar lymphadenopathy. CT angiogram was done which was normal. CSF report showed: normal count, normal sugar, and protein. ADA test was negative. The patient was started on IV prednisolone 500 mg IV two times a day and was gradually tapered off. The patient was also started on acyclovir 500 mg IV for five days and other symptomatic medications. The patient is symptomatically better at the time of discharge.



Figure 1: Physical Examination Before (Left) and After (Right) the Treatment of Isolated Hypoglossal Nerve Palsy

DISCUSSION

Paired hypoglossal nuclei reside in the dorsal paramedial portion of the caudal medulla which extends almost the length of the medulla. After emerging from the hypoglossal nuclei, the hypoglossal nerve courses ventrally through the medullary reticular formation and the medial portion of inferior olive. The

two hypoglossal nerve bundles exit the base of the skull through the hypoglossal canal.⁵The hypoglossal nerve is the motor nerve to the extrinsic and intrinsic muscles of the tongue, except for the palatoglossus. The extrinsic muscles are the genioglossus, the hyoglossus, the styloglossus, and the palatoglossus, and the intrinsic is the superior longitudinal, the inferior longitudinal, the transverse, and the vertical muscles.⁶ Hypoglossal nerve may be affected at any point along its path. Analysis of 100 cases of isolated hypoglossal nerve palsy by Keane et.al showed, malignant tumors, produced nearly half of the palsies, the second most common cause being gunshot wounds followed by Stroke, psychiatric conditions, multiple sclerosis, surgery, Guillain-Barré neuropathy, infection and cryptogenic cause.⁷ Isolated unilateral hypoglossal nerve palsy has been reported in the case of tonsillitis⁸ and also as the sole manifestation of cervical artery dissection.⁹ A study done by Lee et.al showed that hypoglossal nerve palsy does have a self-limiting resolving pattern same as Bell's palsy.¹⁰ Study done by Giuffrida et.al among three patients showed two patients with a history of fever fifteen days back following which they had isolated hypoglossal nerve palsy had self-recovery and one patient who had hypoglossal nerve palsy following trauma had full recovery with steroids.¹¹It shows that the prognosis of hypoglossal nerve palsy is good and usually viral cause of the hypoglossal nerve palsy does not require any treatment.

Given the rarity of this condition, the identification of secondary causes is essential to guide appropriate management. Thorough investigations were done and this case made good recovery with treatment. Isolated hypoglossal nerve palsy is best approached as a diagnosis of exclusion due to its diverse potential etiologies. A systematic diagnostic evaluation is crucial for determining the underlying cause. Prognosis is generally favorable when appropriate treatment is administered, and some cases may resolve spontaneously. Isolated hypoglossal nerve palsy should be considered a diagnosis of exclusion as there are various secondary causes of the hypoglossal nerve palsy as highlighted above. Diagnosis requires a systematic search for the etiology. Prognosis is favorable if the underlying causes are treated and some cases are self-limiting as well. This case had a history of acute pharyngitis 2 months back for which he received treatment and recovered and after 2 months he developed symptoms of tongue deviation and slurred speech. So, the hypoglossal nerve palsy in this patient could be a post-viral manifestation sequel also.

The study underscores the need for a thorough diagnostic approach, including imaging studies, to identify potential causes such as intracranial or extracranial lesions, vascular abnormalities, infections, autoimmune disorders, or other neuropathies that may lead to isolated hypoglossal nerve palsy.

CONCLUSION

Patients with hypoglossal nerve palsy can present in various specialties including dental, general physicians, surgery, and any health workers one should be aware of the significance of its manifestations and appropriate referral should be made to the Neurologist. Proper diagnostic workup to rule out other possible causes should be done in timely manner. Post viral manifestation sequel or idiopathic isolated hypoglossal nerve palsy has favorable outcome after treatment.

REFERENCES

1. Kim SY, Naqvi IA. Neuroanatomy, Cranial Nerve 12 (Hypoglossal). 2022 Nov 7. In: Stat Pearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan.
2. De Sousa Costa R, Ventura N, de Andrade Lourenção Freddi T, da Cruz LCH Jr, Corrêa DG. The Hypoglossal Nerve. *Semin Ultrasound CT MR*. 2023 Apr;44(2):104-114.
3. Ahmed SV, Akram MS. Isolated unilateral idiopathic transient hypoglossal nerve palsy. *BMJ Case Rep*. 2014 Jun 26;2014: bcr2014203930. doi: 10.1136/bcr-2014-203930.
4. Ho MW, Fardy MJ, Crean SJ. Persistent idiopathic unilateral isolated hypoglossal nerve palsy: a case report. *Br Dent J*. 2004 Feb 28;196(4):205-7. doi: 10.1038/sj.bdj.4810980.
5. Lin HC, Barkhaus PE. Cranial nerve XII: the hypoglossal nerve. *Semin Neurol*. 2009 Feb;29(1):45-52. Doi: 10.1055/s-0028-1124022.
6. Sakamoto Y. Morphological Features of the Branching Pattern of the Hypoglossal Nerve. *Anat Rec (Hoboken)*. 2019 Apr;302(4):558-567. doi: 10.1002/ar.23819.
7. Keane JR. Twelfth-nerve palsy. Analysis of 100 cases. *Arch Neurol*. 1996 Jun;53(6):561-6. doi: 10.1001/archneur.1996.00550060105023.
8. Kawaura R, Ohnishi M. Unilateral Isolated Hypoglossal Nerve Palsy Secondary to Tonsillitis. *Cureus*. 2021 Dec 9;13(12): e20291. doi: 10.7759/cureus.20291.
9. Riancho J, Infante J, Mateo JI, Berciano J, Agea L. Unilateral isolated hypoglossal nerve palsy associated with internal carotid artery dissection. *J Neurol Neurosurg Psychiatry*. 2013 Jun;84(6):706. doi: 10.1136/jnnp-2013-304923.
10. S.S. Lee, S.J. Wang, J.L. Fuh, H.C. Liu, Transient unilateral hypoglossal nerve palsy: a case report, *Clinical Neurology and Neurosurgery*, Volume 96, Issue 2, 1994, Pages 148-151, ISSN 0303-8467.
11. Giuffrida, S., Lo Bartolo, M.L., Nicoletti, A., Reggio, E., Lo Fermo, S., Restivo, D.A., Domina, E. and Reggio, A. (2000), Isolated, unilateral, reversible palsy of the hypoglossal nerve. *European Journal of Neurology*, 7: 347-349.
12. Combarros O, Alvarez de Arcaya A, Berciano J. Isolated unilateral hypoglossal nerve palsy: nine cases. *J Neurol*. 1998 Feb;245(2):98-100. doi: 10.1007/s004150050185.