

CORRESPONDENCE

Isolated unilateral lingual paralysis in a supranuclear infarction

Lingual paralysis can result from damage to both upper and lower motor neurons. However, since the hypoglossal nucleus is innervated from both hemispheres simultaneously, unilateral lingual paralysis caused by upper motor neuron has rarely been reported.

A 50-year-old right-handed woman was admitted to our hospital due to suddenly developed dysarthria. The patient had no history of hypertension or diabetes mellitus, and no relevant family history was found. On neurological examination, her tongue deviated to the right on protrusion without fasciculation or atrophy. (Figure 1A). Other neurological examinations were normal. A brain MRI showed focal high signal changes in the left corona radiate and basal ganglia on diffusion-weighted images and T2 fluid-attenuated inversion recovery images. (Figure 1B-E). Ten days later, a repeat MRI showed that the signal intensity on the diffusion-weighted images had resolved and tongue deviation and dysarthria also improved.

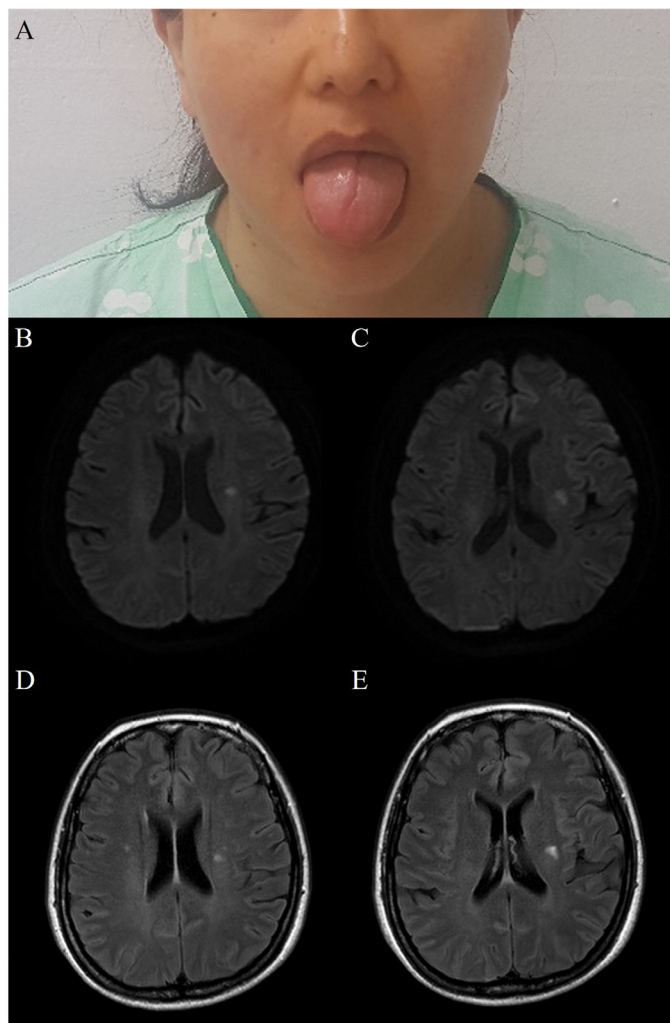


Figure 1: (A) Tongue deviated to the right on protrusion. (B-E) Brain magnetic resonance image high signal changes in the left corona radiate and basal ganglia on diffusion-weighted images (B-C) and T2 fluid-attenuated inversion recovery (D-E).

Isolated unilateral lingual paralysis caused by supranuclear infarction is rarely reported. In our literature review, we found only three cases that had been described due to contralateral cortex¹, corona radiata², or internal capsule.³

Supranuclear control of the hypoglossal nucleus is a well-known bilateral and symmetrical innervation. Unilateral stimulation of the motor cortex⁴ induces bilateral movements of the tongue, indicating bilateral corticonuclear projections. A transcranial magnetic stimulation study reported that stimulation of the unilateral motor cortex produces activation in the contralateral and ipsilateral lingual muscles.⁵

However, unilateral lingual paralysis due to a focal lesion of the contralateral hemisphere and unilateral lingual seizures with focal epileptic discharges⁶ suggest that each hypoglossal nucleus is under the control of both hemispheres, but exclusively under control of the contralateral hemisphere, partially. In the transcranial magnetic stimulation study⁷, humans have bilateral crossed and uncrossed corticolingual projections, and central innervation of the tongue is asymmetric rather than symmetric. The occurrence of supranuclear lingual paralysis may depend on whether there is activation of uncrossed fibers in the unaffected hemisphere in asymmetrical supranuclear control of lingual muscles.

¹Jiyoung Kim, ²Kyoung Jin Hwang

¹Department of Neurology, Pusan medical center, Pusan; ²Department of Neurology, School of medicine, Kyung Hee University, Seoul, Republic of Korea

Address correspondence to: Kyoung Jin Hwang, MD, PhD, Department of Neurology, Kyung Hee University Hospital, 23, Kyungheedaero-ro, Dondaemun-gu, Seoul 02447, Korea. Tel: +82-2-958-8499, E-mail address: jinie111@hanmail.net

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REFERENCES

1. Yoon SS, Park KC. Glossoplegia in a small cortical infarction. *BMJ Case Rep* 2009;2009:bcr2007116376.
2. Fukuoka T, Nakazato Y, Tamura N, Araki N, Yamamoto T. Isolated Hypoglossal Paralysis Caused by Ischemic Infarction in the Centrum Semiovale. *J Stroke Cerebrovasc Dis* 2017;26:e141-e142.
3. Lee JH, Lee D, Heo SH, Chang DI. Isolated Glossoplegia in Capsular Infarction. *Can J Neurol Sci* 2016;43:843-4.
4. Rasmussen T, Penfield W. Further studies of the sensory and motor cerebral cortex of man. *Fed Proc* 1947;6:452-60.
5. Meyer BU, Liebsch R, Roricht S. Tongue motor responses following transcranial magnetic stimulation of the motor cortex and proximal hypoglossal nerve in man. *Electroencephalogr Clin Neurophysiol* 1997;105:15-23.
6. Holtzman RN, Mark MH, Wiener LM, Minzer L. Lingual epilepsy: a case report of an unusual expression of focal cerebral discharge. *J Neurol Neurosurg Psychiatry* 1984;47:317-9.
7. Muellbacher W, Artner C, Mamoli B. Motor evoked potentials in unilateral lingual paralysis after monohemispheric ischaemia. *J Neurol Neurosurg Psychiatry* 1998;65:755-61.