


Unilateral Hypoglossal Nerve Palsy Due to an Uncommon Cause

Patricia Lopez Gomez , David Mato Mañas, Marta Drake-Perez, Carlos Santos Jimenez, Jesús Esteban Garcia, Rubén Martín-Laéz

Keywords: Arachnoid cysts, Hypoglossal nerve, Cerebellopontine angle

doi:10.1017/cjn.2021.193

Can J Neurol Sci. 2022; 49: 706–707

A 71-year-old woman with history of hemicranial headache treated with venlafaxine presented with 3 months of eating difficulties and left deviation of the tongue. Physical examination revealed left hypoglossal paresis with tongue hemiatrophy (Figure 1). Magnetic resonance resonance (MRI) and computed tomography (CT) scan showed bilateral arachnoid cysts in the cerebellopontine angles (CPA), which had intraosseous extension into the left hypoglossal canal. Left side of tongue demonstrated T2-weighted hyperintensity suggesting subacute denervation (Figure 2).

Arachnoid cysts are benign lesions usually located within the subarachnoid space and filled with cerebrospinal fluid.¹ Its



Figure 1: (A–D) 71-year-old woman with left hypoglossal paresis and tongue hemiatrophy on physical examination.

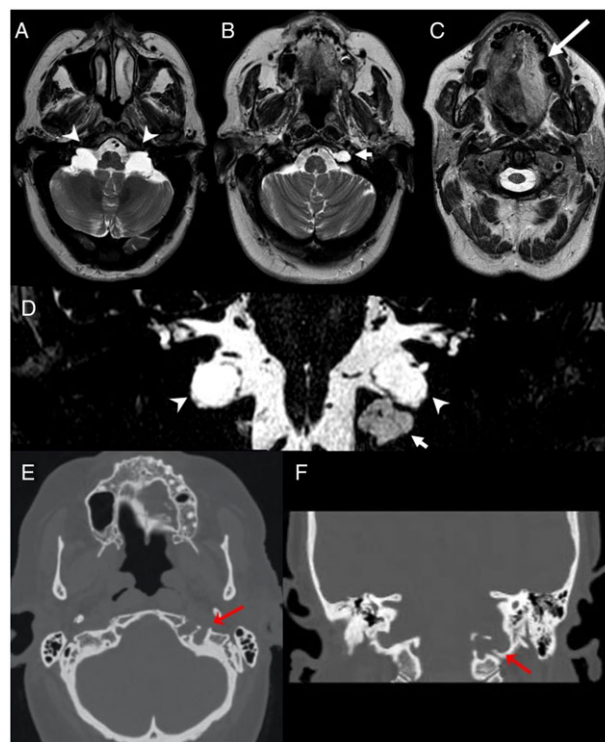


Figure 2: Axial T2-weighted imaging (A–C) and coronal FIESTA MRI (D) show bilateral arachnoid cysts in cerebellopontine angles (arrowheads) and left intradiploic meningocele (short arrow). Note the T2 hyperintensity of left tongue (long arrow) suggesting subacute denervation. Axial (E) and coronal (F) non-contrast CT scan show intradiploic extension along hypoglossal canal (red arrows).

etiology remains controversial, but they are thought to be congenital or secondary to infection, trauma, or changes in cerebrospinal fluid (CSF) pressure.¹

They are most frequently located in the middle cranial fossa. Only 11% of arachnoid cysts are located in CPA. Bilateral arachnoid cysts in this location are even more uncommon, with just four cases reported in the literature.²

From the Department of Neurosurgery, Hospital Universitario Marqués de Valdecilla, Santander, Spain (PLG, DMM, CSJ, JEG, RM-L); and Department of Neuroradiology, Hospital Universitario Marqués de Valdecilla, Santander, Spain (MD-P)

RECEIVED FEBRUARY 17, 2021. FINAL REVISIONS SUBMITTED JUNE 29, 2021. DATE OF ACCEPTANCE AUGUST 4, 2021.

Correspondence to: Patricia Lopez Gomez, Servicio de Neurocirugía, Hospital Universitario Marqués de Valdecilla, Avenida DE Valdecilla s/n. 39007, Santander, Spain. Email: patricia91pz@gmail.com

Table 1: Previous published cases of arachnoid cysts causing hypoglossal palsy

Authors	Age/sex	Symptoms	Time of onset	Treatment
Cartwright et al (1991)	74 years, female	Dysarthria, atrophy of the left half of the tongue	Several months	Surgery: suboccipital craniectomy
Ryu et al (1998)	63 years, female	Atrophy and fasciculations of right side of tongue	Years	Surgery: far lateral approach
Burkhardt et al (2017)	68 years, female	Dysarthria, burning sensation on the tip of the tongue, atrophy of the right half of the tongue	11 months	Surgery: transcondylar approach
Burkhardt et al (2017)	38 years, female	Eating difficulties, atrophy of the right half of the tongue	18 months	Surgery: transcondylar approach

The differential diagnosis of CPA arachnoid cysts includes epidermoid and neuroenteric cysts and cystic acoustic schwannomas.¹ On MRI, arachnoid cysts show CSF signal characteristics in all MR sequences, unlike epidermoid cysts that restrict (show high signal intensity) on diffusion-weighted images.³ Therefore, for proper diagnosis and management of this type of lesions, we recommend a careful radiological evaluation, including MRI with diffusion-weighted images and high-resolution bone CT scan.

Most arachnoid cysts are asymptomatic. However, up to 5% produce symptoms due to direct compression. In CPA, the most common symptoms include facial spasm, trigeminal neuralgia, hearing loss, and vertigo.² Paresis of twelfth cranial nerve due to an arachnoid cyst has only been described four times in the literature to the best of our knowledge (Table 1).^{4,5} In our case, the patient presented with hypoglossal palsy only.

The management of CPA arachnoid cysts is still controversial. It is generally accepted that asymptomatic patients do not require treatment and should undergo radiological follow-up. However, symptomatic arachnoid cysts that affect quality of life should be treated surgically, either by fenestration or CSF shunting.^{1,2}

Nevertheless, it is still difficult to establish which is the best treatment option. Fenestration by craniotomy allows a greater resection of the membranes and a wide communication with subarachnoid cisterns. In fact, it was the treatment option in most of cases of bilateral CPA cysts and in all cases of arachnoid cysts invading the hypoglossal canal.^{2,4,5}

Shunt placement is a less aggressive option; however, it presents a high rate of complications, such as valve dependence, dysfunction, and infection.

Endoscopic fenestration is proposed today as the least aggressive option with fewer complications; however, more studies must be carried out to establish the advantage of this technique over the previous ones.²

In our case, patient chose not to be treated surgically since the symptoms that she presented did not significantly affect her quality of life.

In conclusion, this is a unique case of a bilateral posterior cerebral artery arachnoid cyst affecting left hypoglossal canal resulting on a twelfth cranial nerve paresis. Both conditions, bilateral CPA arachnoid cysts and arachnoid cysts affecting hypoglossal canal, have never been reported on the same patient before.^{2,5}

ACKNOWLEDGEMENTS

We acknowledge the Neurosurgery and Neuroradiology departments from Hospital Universitario Marqués de Valdecilla for the advise and feedback to this project. We also thank the voluntary participation of the patient.

CONFLICT OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

STATEMENT OF AUTHORSHIP

PLG: drafting the manuscript; DMM: revising the manuscript and supervision; MDP: data collection; CSJ: data collection; JEG: revising the manuscript; RML: revising the manuscript.

REFERENCES

- Sharma A, Sharma A, Mittal RS, Gandhi A. Bilateral cerebellopontine arachnoid cyst: a rare entity. *Br J Neurosurg*. 2015;29:576–8. DOI [10.3109/02688697.2015.1015100](https://doi.org/10.3109/02688697.2015.1015100).
- Gelabert González M, Arán Echabe E, Pita Buezas L. Quiste aracnoideo bilateral del ángulo pontocerebeloso. *Rev Neurol*. 2016;62:555. DOI [10.33588/rn.6212.2016012](https://doi.org/10.33588/rn.6212.2016012).
- Osborn AG, Preece MT. Intracranial cysts: Radiologic-pathologic correlation and imaging approach. *Radiology*. 2006;239:650–64. DOI [10.1148/radiol.2393050823](https://doi.org/10.1148/radiol.2393050823).
- Ryu H, Makino A, Hinokuma K. An arachnoid cyst involving only the hypoglossal nerve: case report and review of the literature. *Br J Neurosurg*. 1999;13:492–5. DOI [10.1080/02688699943321](https://doi.org/10.1080/02688699943321).
- Burkhardt JK, Bal C, Neidert MC, Bozinov O. The transcondylar approach to access symptomatic arachnoid cysts of the hypoglossal canal. *Oper Neurosurg*. 2018;14:E23–E25. DOI [10.1093/ons/opx117](https://doi.org/10.1093/ons/opx117).