



NEUROLOGY PERSPECTIVES

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Cough headache associated with CANVAS: A case report



Cefalea tusígena asociada a enfermedad de CANVAS: A propósito de un caso

Background

Cough headache is triggered by coughing, straining, or other Valsalva manoeuvres,¹ and its prevalence amounts to approximately 1%. Pain may manifest at different locations, with occipital, bifrontal, or hemicranial involvement. Pain is described as pressing in the majority of cases, but also as explosive, electric, or mixed.² Up to 40% of cases of cough headache are symptomatic, due to a secondary cause.¹ The most frequent secondary cause is Arnold-Chiari malformation type I,³ but other causes have been described, such as posterior cranial fossa tumours or spontaneous intracranial hypotension.²

Primary and secondary cough headaches present differentiating clinical characteristics. Primary cough headache usually manifests in patients older than 50 years, with pain lasting seconds and not predominating in the occipital area, no other neurological symptoms, and a good response to indomethacin.⁴ Secondary cough headache manifests in younger patients, with more prolonged occipital pain, accompanying neurological symptoms,⁵ and poorer response to indomethacin.⁶ A detailed medical history, thorough physical examination, and appropriate imaging studies are essential for differential diagnosis.

The pathogenesis of this entity is unclear. Pain is thought to be due to an elevation in intracranial pressure secondary to an increase in central venous pressure precipitated by coughing or any other Valsalva manoeuvre.³ Therefore, it is especially important to assess the origin of cough, as alleviating it may be part of the treatment. Coughing may be a sign of an underlying neurological disease.⁷ The main neurological diseases associated with chronic coughing are summarised in Table 1 and include CANVAS (cerebellar ataxia, neuropathy, and vestibular areflexia syndrome).

Case report

We present the case of a 54-year-old man with a personal history of arterial hypertension, atrial fibrillation, and

vertigo. He was initially assessed in 2017 due to a left parietal headache associated with subdural haematoma treated with burr hole drainage, which achieved complete resolution of pain. In 2019, the patient was reassessed due to recurrent episodes of intense left parietal headache and dizziness associated with cough. The physical examination revealed no relevant findings. An MRI study showed an incidental subependymoma in the fourth ventricle (Fig. 1), which led to a diagnosis of cough headache secondary to subependymoma. After consulting with the neurosurgery department, we ruled out an association between the tumour and the symptoms, as well as the need for surgical treatment. Treatment with non-steroidal anti-inflammatory drugs (NSAIDs) was started, achieving a significant improvement. NSAID treatment was discontinued in 2022, due to hypertension and risk of rebleeding. The patient presented new episodes of cough headache together with dizziness and instability. A follow-up MRI study revealed no significant changes. As symptoms persisted, the patient was assessed by the pulmonology department and was diagnosed with possible asthma. Treatment with bronchodilators was started, with no improvement in cough. He was newly assessed by the neurology department in 2023 due to symptom progression, with distal paraesthesia in the limbs, tacto-algesic hypoesthesia, intentional and postural tremor, lower limb spasticity, and gait ataxia. A new neurological examination was performed, including brain and spinal cord MRI studies, which yielded no relevant findings; the neurophysiological study revealed axonal sensory polyneuropathy. Autoimmune and serology studies yielded normal results. The patient was referred to the otorhinolaryngology department and was diagnosed with bilateral vestibular hypofunction. Finally, a

Table 1 Neurological diseases associated with increased cough reflex sensitivity and its mechanisms. Adapted from Al-Biltagi et al.⁷

Lesion location	Causes
Central nervous system	Spinal lesion (eg, Chiari malformation type I); space-occupying lesion; neuromyelitis optica
Cerebellum	Cerebellar neurodegenerative diseases (eg, autosomal dominant cerebellar ataxia)
Vagal neuropathy	Viral infections, toxic substances, vitamin B ₁₂ deficiency

<https://doi.org/10.1016/j.neurop.2025.100202>

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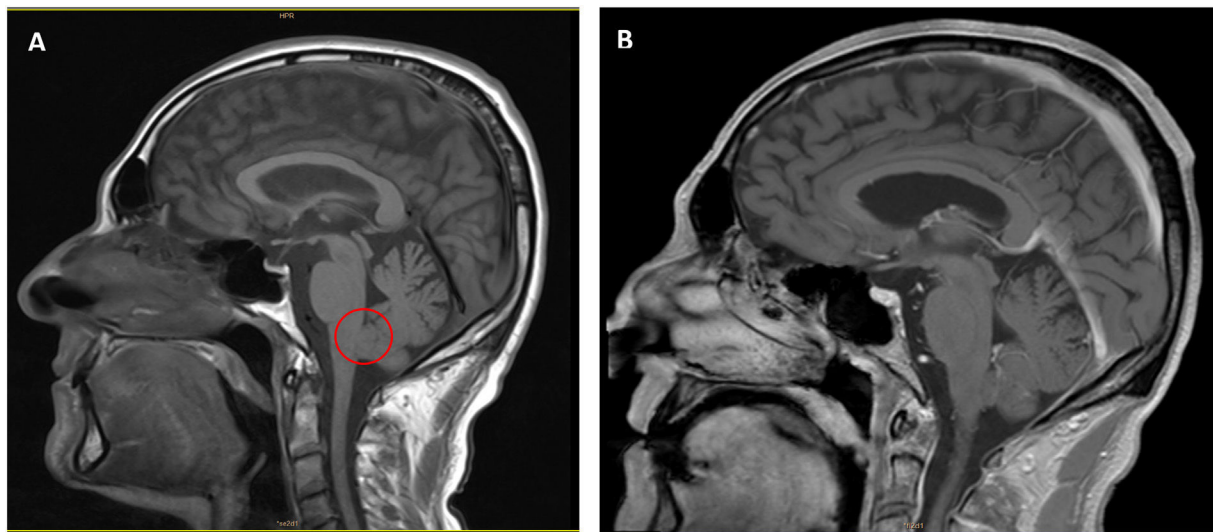


Figure 1 Sagittal slices from T2-weighted (A) and T1-weighted (B) contrast MRI studies, showing a lesion measuring 14 mm craniocaudally, 13 mm transversally, and 9 mm anteroposteriorly, of extra-axial appearance and located at the obex of the fourth ventricle. No oedema or perilesional gliosis is observed. The signal is relatively homogeneous, with no diffusion restriction and no enhancement after intravenous contrast administration; this is compatible with subependymoma of the fourth ventricle.

targeted genetic study confirmed a homozygous mutation of the pathogenic expansion of the *RFC1* gene (AAGGG allele), compatible with CANVAS. A multidisciplinary team opted to resume NSAID treatment despite its risks, as cough, considered a symptom, had not improved with conventional treatment. The patient presented a full resolution of headache.

Discussion

A literature search identified no other case of CANVAS associated with cough headache. This is an infrequent disease, with up to 40% of cases presenting a possible association with an underlying cause,¹ although distinguishing between primary or secondary cough headache is sometimes difficult, as in our case. We should highlight that cough headache may be the sign leading to the diagnosis of neurological diseases associated with chronic cough,⁷ such as CANVAS. Sixty-eight percent (30%–97%) of the patients with CANVAS may present chronic cough, whose onset may precede the remaining symptoms by as much as 30 years.⁸ These patients do not respond to conventional cough suppressants; therefore, early diagnosis and multidisciplinary management are essential for improving their quality of life.

Informed consent

This study contains no data or images that may identify the patient; therefore, in accordance with the journal's requirements for publication, no informed consent is provided.

Ethical considerations

This study involves no experiments with humans.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) used Perplexity in order to improve language and readability. After using this tool/service, the author(s) reviewed and edited the content as needed and took full responsibility for the content of the publication.

Funding

This study has received no funding of any kind.

Conflicts of interest

The authors of this study have no conflicts of interest to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.neurop.2025.100202>.

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