



## Case report

# Hemifacial spasm caused by a cerebellopontine angle arachnoid cyst. Case report and literature review

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## ABSTRACT

Arachnoid cysts involving the cerebellopontine angle are an unusual cause of hemifacial spasm. The case is reported of a 71-year old woman presenting with a right hemifacial spasm and an ipsilateral arachnoid cyst. Preoperative magnetic resonance imaging findings suggested a neurovascular compression caused by displacement of the facial-acoustic complex and the anterior inferior cerebellar artery by the cyst. Cyst excision and microvascular decompression of the facial nerve achieved permanent relief. The existing cases of arachnoid cysts causing hemifacial spasm are reviewed and the importance of a secondary neurovascular conflict identification and decompression in these cases is highlighted.

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## Espasmo hemifacial causado por un quiste aracnoideo del ángulo pontocerebeloso. Caso clínico y revisión de la literatura

## RESUMEN

Los quistes aracnoideos del ángulo pontocerebeloso son una causa inusual de espasmo hemifacial. Describimos el caso de una mujer de 71 años que presentaba un espasmo hemifacial derecho y un quiste aracnoideo ipsilateral. Los hallazgos de la resonancia magnética preoperatoria indicaban una compresión neurovascular provocada por el desplazamiento del complejo nervioso facial-acústico y de la arteria cerebelosa anteroinferior por el quiste.

## Palabras clave:

Espasmo hemifacial

Quiste aracnoideo

Ángulo pontocerebeloso

Descompresión microvascular

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La extirpación del quiste y la descompresión microvascular del nervio facial consiguieron un alivio permanente del espasmo. Se revisan los casos conocidos de espasmo hemifacial secundario a un quiste aracnoideo y se resalta la importancia de identificar un conflicto neurovascular secundario y de realizar una descompresión en estos casos.

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## Introduction

Hemifacial spasm (HFS) is characterized by paroxysmic involuntary and painless contractions of the muscles of one half of the face, innervated by the ipsilateral facial nerve. It may arise as a consequence of inflammation of the nerve such as Bell's palsy or, more commonly as the result of chronic irritation which in more than 95% of the cases is caused by neurovascular compression.

We present a rare case of HFS caused by a cerebello-pontine angle (CPA) arachnoid cyst.

## Case report

A 71 year-old woman was submitted to our department with a 5-year history of right (HFS), which produced daily attacks triggered by stress. There was no hearing loss, tinnitus or vertigo. Initial treatment with botulinum toxin infiltrations rendered up to 3 months without spasms. The MRI showed thin-walled lesion occupying the right CPA, hypointense on a T1-weighted and hyperintense on T2-weighted sequences. The 3D-T2 FIESTA (Fast Imaging Employing Steady-state Acquisition) study showed a cystic lesion displacing the facial-acoustic nerve complex upward and generating a vasculonervous compression against an arterial loop apparently corresponding to the ipsilateral anteroinferior cerebellar artery (AICA) (Fig. 1).

The patient was offered surgery which was preformed through a retrosigmoid approach. Microsurgical dissection endoscopically assisted allowed to identify and fenestrate the arachnoid. Displaced by the superomedial wall of the cyst, the facial-acoustic nerve complex contacted anteriorly with a loop of the right AICA, so a microvascular decompression with interposition of Teflon was performed (Fig. 2).

The patient experienced complete resolution of the HFS and remains symptom-free at one-year follow-up.

## Discussion

Like in trigeminal neuralgia, in more than 95% of the cases HFS is caused by neurovascular compression affecting the root exit zone of the facial nerve. The most common offending vessel is the AICA, accounting for more than 50% of the cases, while the rest may be caused by the posteroinferior cerebellar artery (PICA), the basilar artery or veins.<sup>1</sup> Space-occupying lesions of the CPA are a rare cause of HFS, although several cases such as epidermoid tumors, meningiomas, acoustic neuromas, lipomas, etc., have been reported

in the literature.<sup>2</sup> Among these arachnoid cysts involving the CPA are very unusual with only 5 previous cases reported to our knowledge (Table 1).<sup>2-6</sup> Arachnoid cysts involving the cerebellopontine angle are usually asymptomatic developmental lesions originating from a splitting of the arachnoid and containing cerebrospinal fluid.<sup>7</sup> In some cases they can cause symptoms related to brainstem compression such as: hydrocephalus, cranial neuropathies, ataxia, etc.<sup>8</sup> In two of the cases the patient associated HFS with VIIIth cranial nerve dysfunction like hearing loss and tinnitus. Arachnoid cysts generally do not show growth, bleeding or any other changes that might explain the irritating effect on the facial nerve. It has been hypothesized that the cyst wall may transmit the arterial pulse of posterior fossa vessels in cases where no neurovascular conflict could be identified.<sup>2</sup> But in three of the reported cases a clear vascular compression of the facial nerve was observed. In all these cases the cyst was responsible for the neurovascular conflict by displacing either the facial-acoustic nerve complex or the offending artery and thus creating the compression. Therefore like in our case a cyst fenestration and membrane excision may not be enough to relief the compression of the facial nerve. Microsurgical dissection of the artery and, if necessary, decompression by interposition of Teflon is warranted if a neurovascular conflict is observed. Recent introduction of high definition 3D T2-weighted MRI sequences allows to assess preoperatively neurovascular conflicts of the CPA. These studies have proven a high accuracy in cases of trigeminal neuralgia.<sup>9</sup> Preliminary results in surgical series of HFS show high sensitivity and sensibility.<sup>10</sup> Preoperative MRI depicted a clear neurovascular conflict in our case, which was sought and found with the aid of microsurgical and endoscopical inspection both before and after incising and removing the cyst wall. The endoscopically assisted technique

**Table 1 – Arachnoid cysts of the CPA causing hemifacial spasm.**

Author/year	NVC	VIIIth nerve involvement	Treatment
Altinörs 1991	No	No	Cyst excision
Higashi 1992	PICA	No	Cyst excision + MVD
Takano 1998	AICA	Tinnitus	Cyst excision + MVD
Bonde 2008	AICA	Hearing loss	Cyst excision
Mastronardi 2009	No	No	Cyst excision
Ruiz	AICA	No	Cyst excision + MVD
NVC, neurovascular compression; MVD, microvascular decompression.			

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