CEREBELLOPONTINE ANGLE ARACHNOID CYST: A CASE OF HEMIFACIAL SPASM CAUSED BY AN ORGANIC LESION OTHER THAN NEUROVASCULAR COMPRESSION: CASE REPORT

OBJECTIVE: A rare case of cerebellopontine angle arachnoid cyst manifesting as hemifacial spasm (HFS) is reported. The patient is a 42-year-old woman with 10-month history of left HFS. A preoperative magnetic resonance imaging scan showed a well-demarcated area, hypointense on T1-weighted imaging and hyperintense on T2-weighted imaging, in the left cerebellopontine angle, without contrast enhancement, resembling an arachnoid cyst.

METHODS: The cyst was excised with microneurosurgical technique and the facial, vestibular, and acoustic nerves were completely decompressed from the arachnoid wall.

RESULTS: The postoperative course was uneventful, and the left HFS disappeared immediately. Histologically, the cyst wall was a typical arachnoidal membrane. Ten months after surgery, the patient is symptom free.

CONCLUSION: It is well-known that in approximately 10% of cases, trigeminal neuralgia can be caused by a space-occupying mass. However, the fact that HFS can also be caused by organic lesions as well as neurovascular compression is less well-known. Although the occurrence of tumor compression causing HFS has been previously recognized, cerebellopontine angle cysts have very rarely been described. The observation of a patient with a cerebellopontine angle arachnoid cyst causing HFS prompted us to review the literature relative to HFS caused by an organic lesion rather than neurovascular compression.

KEY WORDS: Arachnoid cyst, Hemifacial spasm, Microvascular decompression, Posterior cranial fossa surgery

In more than 95% of cases, the cause of hemifacial spasm (HFS) is a cross-compressive effect of an artery or arteries at the root exit zone of the VIIth nerve (1, 5, 11, 15, 16, 31, 32, 34, 45, 66, 79). The facial nerve exits the lateral side of the brainstem at the caudal end of the pons and runs upward for approximately 5 mm before going into the cerebellopontine cistern. According to the extensive experience of the senior author (TF) and the literature (15, 16, 31, 32, 45, 66, 79), the vascular compression is most often at the nerve root exit zone, and approximately one-third is caused by the posterior internal carotid artery, another one-third by anterior internal carotid artery, and another one-third by a tortuous vertebral artery or a combination of 2 or 3 arteries.

In the personal experience of the senior author (TF) of more than 3500 cases of HFS over 20 years, there are approximately 20 documented cases of tumors and other rare causes of HFS (unpublished data). Among these cases, a cerebellopontine angle (CPA) arachnoid cyst was never observed. The case of a woman with left HFS caused by a CPA arachnoid cyst confirmed by magnetic resonance imaging prompted us to report it and to review the international literature.

CASE REPORT

This 42-year-old woman had a 10-month history of complete left HFS, with more than 10 attacks...
In conclusion, CPA tumors or space-occupying lesions manifesting as HFS are very rare (32, 48, 73). In particular, among 20 documented cases of tumors and other rare causes of HFS, accounting for 0.57% (unpublished data).

Several organic lesions causing HFS have been reported in the literature. Searching the MEDLINE-PubMed website, we found 85 cases of HFS caused by an organic lesion other than neurovascular compression. In particular, the CPA space-occupying lesions described in detail are 16 cases of epidermoid tumors (according to the literature, 7.7%–17% of patients affected by CPA epidermoid cysts have HFS and 0.24%–1.2% of HFS episodes are provoked by CPA epidermoid cysts [4, 17, 23, 35, 42, 43, 48, 51, 55, 56, 71, 72, 75]); 12 cases of ipsilateral CPA meningiomas (12, 13, 21, 25, 27, 38, 41, 48, 78) to which must be added 2 cases of tentorial meningioma (51, 56) and 1 case of occipital falxine meningioma (6); 12 cases of ipsilateral acoustic neuroma (10, 23, 25, 50, 51, 57, 60, 65) and 1 case contralateral (53); 8 cases of lipoma (9, 24, 37, 39, 40, 63, 64, 73); 2 cases of gangliocytoma-ganglioglioma (7, 47); 2 cases of cholesteatoma of petrous apex (8, 59); 2 cases of cerebellar astrocytoma (46, 67); and 1 case each of neurofibromatosis and Arnold-Chiari (20), intermediate nerve schwannoma (36), neurinoma of the hypoglossal nerve (58), dysontogenetic tumor (24), glomus jugulare tumor (33), venous angioma (14), and cerebellar hematoma (29).

Among other various lesions outside the CPA, we found 3 cases of pontine, fourth ventricle, and cerebellar vermis glioma (19, 22, 77), 3 cases of parotid gland tumor (18, 23, 54), 2 cases of fourth ventricle schwannoma (76), 1 case of fourth ventricle ependymoma (61), 1 case of hemangioma at the geniculate gangleon (3), and 1 case of tentorial cavernous angiomma (44).

Among CPA cystic lesions, we found 2 cases of ependymal cyst (26, 68), 1 case of epithelial cyst (30), 1 case of neuroglial cyst (70), 1 case of dermoid cyst (52), and 3 cases of arachnoid cyst, to which we add our own cases (2, 28, 74).

In the case described by Higashi et al. (28), the patient underwent evacuation of the arachnoid cyst by partial membranectomy without any effect and HFS disappeared by re-exploration and microvascular decompression of the facial nerve. In this case, the cyst produced deviation of the ipsilateral posterior inferior cerebellar artery, which was in contact with the root exit zone of the facial nerve.

In conclusion, CPA tumors or space-occupying lesions manifesting as HFS are very rare (32, 48, 73). In particular, among

**DISCUSSION**

In the vast experience of the senior author (TF) and in accordance with the literature (1, 5, 11, 15, 16, 31, 32, 34, 45, 66, 79), HFS is generally caused by pulsatile vascular compression on the facial nerve root exit zone. In a series of 115 consecutive patients undergoing microvascular decompression for HFS, Campos-Benitez and Kauffman (11) observed that the neurovascular compression was at the root detachment point (corresponding to the transition zone or Obersteiner-Redlich zone) in approximately 25% of cases and rarely at the more distal facial nerve root; the majority of compressions were more proximal (on the pontine surface or pontomedullary sulcus) at the origin of the facial nerve.

When considering aneurysms, arteriovenous malformations, and tortuosities of the vertebralbasilar arterial system provoking HFS among the causes of neurovascular compression of facial nerves, CPA tumors or space-occupying lesions manifesting as HFS are very rare (32, 49, 73). Analyzing cumulatively 2 large series of patients treated for HFS (49, 73), in 2406 cases, only 11 CPA space-occupying lesions (0.46%) were observed. In the experience of the senior author (TF) of more than 3500 cases of HFS over 20 years, there are approximately 20 documented cases of tumors and other rare causes of HFS, accounting for 0.57% (unpublished data).
the 8 cystic CPA lesions causing HFS (2, 26, 28, 30, 52, 68, 70, 74), 3 were arachnoid cysts. As in our own cases, in all 3 of these cases, the treatment was surgical: decompression of the cyst using a microsurgical technique, meninagecomy, and, if necessary, neurovascular decompression of the facial nerve by displaced arteries at its root exit zone. In all cases, treatment resulted in complete resolution of HFS.

Disclosure

The authors have no personal financial or institutional interest in any of the drugs, materials, or devices described in the article.

REFERENCES


Author Query

AQ 1: Please read article carefully to make sure that intended meaning was retained after editing. Insertion of manifesting to replace presenting OK here and throughout?

AQ 2: Please clarify what you mean by “cerebrospinal fluid went out” here and in legend for Fig. 2. Do you mean flowed? Leaked? Emptied?

AQ 3: In the sentence beginning “In conclusion,” edit to “manifesting as” OK?

AQ 4: Please cite reference 62 in text or mark for deletion. If marked for deletion, do not renumber references.