Gas CT Cisternography of an Intracanalicular Vascular Malformation

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Gas CT cisternography has been shown to be an excellent technique for diagnosing intracanalicular acoustic neuromas [1, 2]. While other intracanalicular lesions, such as meningiomas, hemangiomas, cholesteatomas, gliomas, and hamartomas, are much less common, they do occur [3-6]. We describe the cisternographic findings in a patient with a purely intracanalicular vascular malformation and point out possible differentiating features.

Case Report

A 44-year-old man had an approximately 20 year history of progressive left-sided hearing loss and facial weakness. At admission there was total deafness in the left ear and a total left peripheral seventh nerve palsy. Neurologic examination was otherwise normal.

He had been evaluated numerous times with radiologic studies including pneumoencephalography, polytomography, CT, and angiography, none of which demonstrated any abnormality. An air CT cisternogram was obtained that demonstrated an abnormal intracanalicular soft-tissue mass with a concave border toward the air (fig. 1). There was no overall expansion of the internal auditory canal as compared with the opposite side; however, a small focal area of erosion was present along the posterior wall (fig. 1A). In addition, the loop of the anterior inferior cerebellar artery (AICA) was demonstrated in the cerebellopontine angle with a branch (internal auditory artery) entering the internal auditory canal (IAC).

The patient subsequently underwent a retromastoid craniotomy for removal of the lesion. At surgery the loop of the AICA was identified at the porus, and there was an enlarged internal auditory artery entering the IAC between the facial and superior vestibular nerves. Within the canal a small tangle of abnormal vessels was found attached to the superior vestibular nerve. A portion of the vessels was removed. The cochlear, inferior vestibular, and facial nerves appeared intact.

Microscopic examination of the resected tissue showed delicate fibrous connective tissue with multiple thin-walled blood vessels consistent with a vascular malformation. Postoperatively, there was no improvement in the patient’s hearing or facial paralysis.

Fig. 1.—Air CT cisternograms. A, Abnormal soft-tissue mass in lateral part of IAC (arrow). Loop of AICA at porus (large white arrow) and enlarged internal auditory artery (small white arrow) entering canal. Eighth nerve is seen entering canal anteriorly (large black arrows). Focal area of erosion along posterior wall (small black arrow) without overall expansion of canal. B, Abnormal intracanalicular mass with convex border toward air (arrows).
Discussion

Intracanalicular vascular malformations and hemangiomas (capillary or cavernous) are rare lesions much less common than acoustic neuromas [4, 7]. There has been little published concerning the radiographic appearance of these lesions. Mangham et al. [4], in their series of 10 patients with intratemporal vascular tumors, showed one patient in whom a largely intracanalicular vascular malformation was demonstrated on intravenous contrast-enhanced CT as an enhancing lesion at the porus acusticus. Anderson et al. [8], in their series of 154 gas CT cisternograms, had one patient with a surgically proven hemangioma. The cisternogram showed an abnormal mass at the porus with minimal extension into the cerebellopontine angle and air filling the rest of the IAC [8].

Our current case points out a number of findings that may be useful in differentiating these lesions from acoustic neuromas. First, the lesion had a concave border with the air. This is not present with acoustic neuromas, which typically have a convex border or rarely a relatively flat border with the air [1, 2]. Secondly, there was no overall expansion of the IAC, which is fairly common even with intracanalicular acoustic neuromas [2]. The third finding was that of demonstration of the internal auditory artery, which was confirmed to be enlarged at surgery. While the loop of the AICA can be demonstrated on gas CT cisternography, the size of the normal internal auditory artery (0.15 mm) makes it very difficult to identify, being questionably imaged only once in a recent series of 103 normal cisternograms [9]. The AICA and internal auditory artery may be enlarged in a small percentage of patients with acoustic neuromas; however, this finding has not yet been demonstrated with small tumors on gas CT cisternography.

An important clinical feature often associated with these vascular malformations is facial weakness or paralysis, which is much less common with acoustic neuromas of similar size [4, 7].

In conclusion, when an intracanalicular mass is demonstrated on gas CT cisternography with features atypical for an acoustic neuroma and accompanied by an enlarged internal auditory artery, the possibility of a vascular malformation should be considered.

REFERENCES

1. Pinto RS, Kricheff II, Bergeron RT, Cohen N. Small acoustic neuromas: detection by high resolution gas CT cisternography. AJR 1982;139:129-132