Clinical characteristics and CT findings in lipoma of the cerebellopontine angle

Case report

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The authors present a rare case of symptomatic lipoma of the cerebellopontine angle, and describe the computerized tomography and operative findings. These are tumors of maldevelopmental origin, and the three cases reported to date have shown many similarities.

Key Words • cerebellopontine angle • lipoma • trigeminal neuralgia • auditory nerve

Intracranial lipoma is a rare tumor of maldevelopmental origin occurring most frequently at the midline. Except in cases of lipoma in the callosal area, focal neurological symptoms are rarely present.

Lipomas of the cerebellopontine angle (CPA) have been reported with less frequency than those in the midline, and lipomas of the CPA associated with focal neurological symptoms have been documented only twice.1,3 We describe the computerized tomography (CT), surgical, and pathological findings in a patient with a symptomatic CPA lipoma.

Case Report

This 26-year-old man presented with a 5-year progressive history of left-sided trigeminal neuralgia. Pain was primarily distributed along the second division. During the 2 years before admission, the patient had noted intermittent episodes of dizziness and buzzing, and a feeling of fullness in the left ear.

Examination. The neurological evaluation revealed no significant abnormalities. The patient had slight external asymmetry to the face, with the orbital area on the left being slightly lower than that on the right. Audiological evaluation revealed a very minimal sensorineural deficit and a mild conductive deficit in the left ear. Vestibular testing was not performed. Electroencephalography revealed a normal waking record.

The CT examination was performed on an EMI 5005 unit. Transaxial and coronal CT scans (Fig. 1) demonstrated a low-attenuation lesion (−25 to −45 Hounsfield units) of the left CPA measuring 1.5 cm in diameter. The attenuation values of this lesion were significantly less than those of cerebrospinal fluid (CSF) and significantly greater than those of air within the mastoid cells. This lesion demonstrated no definite enhancement following intravenous infusion of 150 ml of Conray 60. Vertebral angiography and plain skull x-ray films with base views were negative.

Fig. 1. Computerized tomography scans, before (left) and after (right) contrast injection showing a low-density lesion in the left cerebellopontine angle (arrows).
A persistent metopic suture line was present. Analysis of CSF revealed a protein level of 35 mg% and no cells.

**Operation.** A left suboccipital craniectomy was performed, and a grayish-yellow tumor in the left CPA was identified. The tumor encompassed the roots of the seventh, eighth, ninth, and 10th cranial nerves, and compressed and displaced the fifth cranial nerve. No clear-cut line of demarcation between the tumor and the brain stem could be demonstrated. The tumor was adherent to both the brain stem and the involved cranial nerves. Multiple small vessels and fibrous strands traversed the tumor. The lateral wall of the tumor merged via a small stalk with the dura just posterior to the internal auditory canal. A small bony endostosis extended into the stalk for several millimeters. The tumor could be only partially resected because of the embedded cranial nerves and vascularity. The compressed trigeminal root fibers were partially sectioned for relief of the trigeminal neuralgia pain.

**Postoperative Course.** Since the operation, the patient has had complete relief of his trigeminal neuralgia. He has had severe hearing loss on the left, presumably due to direct trauma to the enveloped eighth nerve or possibly secondary to injury to the internal auditory artery. Histological examination showed the tumor to be composed of mature adipose tissue with varying degrees of vascularity (Fig. 2). No other hamartomatous elements were identified. The diagnosis was lipoma.

**Discussion**

An intracranial lipoma located at the CPA and associated with focal neurological symptoms is an exceedingly rare occurrence. Only two other cases have been reported. These three cases showed many similarities, as follows: 1) All cases involved young adults (a 28-year-old woman, a 26-year-old woman, and a 26-year-old man). 2) All cases presented with slowly progressive focal neurological symptoms. 3) All cases involved the left CPA. 4) Complete resection of the tumor could not be accomplished in any of the patients because of the incorporation of cranial nerves and vessels. 5) Histologically, the tumors were composed of mature adipose cells with varying degrees of vascularity. No other hamartomatous elements were identified.

The CT findings in our case could not lead one to a definite preoperative diagnosis. Many entities other than lipoma can present as low-attenuation lesions of the CPA. These include acoustic neuroma, trigeminal neuroma, metastasis, abscess, epidermoid cyst, dermoid cyst, teratoma, and cholesteatoma. While these lesions may present as low-attenuation lesions of the CPA, they rarely demonstrate the very low values associated with the fatty content of a lipoma. In addition, these entities usually demonstrate some degree of enhancement.

The location of tumors of maldevelopmental origin with respect to the midline is thought to relate to the time when the tissue becomes incorporated within the central nervous system. If the inclusion occurs before 3 weeks of age, the lesion is associated with the midline. If the inclusion occurs later than 5 weeks, the lesion is further from the midline. Inclusion of only mesodermal adipose tissue accounts for the mature adipose cells found in intracranial lipomas without association with other hamartomatous elements. This case is unusual because of the definite small dural stalk and endostosis. These findings support an origin from the dura. The close affinity to the cranial nerves and brain stem supports an origin from the pia. This suggests a case of maldevelopment in which there was a failure of normal separation of the layers of the meninges. As Budka states, this is a “dysgenetic lesion, affecting both mesenchymal and neuroectodermal tissue components.”

The adipose tissue found in lipomas of the CPA is reflected in the CT appearance of non-enhancing, low-attenuation lesions. The slightly higher attenuation values noted in this case of lipoma of the CPA as compared to lipoma of the callosal area and peripheral extremities can be accounted for by the averaging effect of the cranial nerves and vessels incorporated within the tumor.

**Conclusions**

Intracranial lipomas are rare, especially at sites other than the midline. Except for those of the callosal area, almost all reported cases were asymptomatic and incidently found at autopsy. The advent of CT has greatly facilitated the evaluation of intracranial lesions. The overall reported incidence of intracranial lipoma has almost doubled when compared to the pre-CT literature. Therefore, it is very likely that lipomas of the CPA will be encountered more fre-
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sequently in the future. Based on this case and the previous reports in the literature, the following points should be considered:

1. Lipoma of the CPA should be included in the differential diagnosis of low-attenuation, non-enhancing lesions of the CPA in young adults with chronic progressive focal neurologic symptoms.

2. Lipoma of the CPA may be identified on CT scans in patients without associated neurological symptoms. These may represent the majority of CPA lipomas and be only an incidental finding.1,10

3. Operatively, a lipoma of the CPA may not be amenable to complete resection due to the intimate involvement of cranial nerves, vessels, and the pia of the brain stem. Treatment depends on the specific neurological syndrome caused by the lipoma. In our patient with tic douloureux, partial decompression and rhizotomy relieved the problem.

References

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