MR appearance of intracanalicular eighth nerve lipoma.

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AJNR Am J Neuroradiol 1992, 13 (4) 1188-1190
http://www.ajnr.org/content/13/4/1188

MR Appearance of Intracanalicular Eighth Nerve Lipoma

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Summary: The authors present the MR appearance of an intracanalicular eighth nerve lipoma in a 30-year-old woman, describe the clinical manifestations, and discuss the possible etiology; biopsy findings were conclusive. Precontrast T1-weighted images should be obtained.

Index terms: Nerves, vestibulocochlear (VIII); Lipoma

Reports of intracanalicular and cerebellopontine angle (CPA) lipomas are extremely rare in the english literature (1–3). Few were purely intracanalicular while most extended into the CPA (2, 3). The rarity of this tumor combined with its insidious presentation in the past has posed a diagnostic dilemma. The preoperative diagnosis of an intracanalicular intraneural lipoma of the eighth nerve using magnetic resonance (MR) and computed tomography (CT) scanning is presented in the following case report.

Case Report

A 30-year-old obese black woman presented with an 8-year history of global headaches that recently began to laterlize to the left ear and occipital region. A MR scan was obtained and the patient was transferred to us with the diagnosis of an intracanalicular acoustic neuroma. On presentation, she complained of dysesthesias of the left face and external auditory canal (EAC). There was lateralization of Weber and Rinné testing and a positive Hitselberger sign (4) consisting of decreased pinprick and light touch sensation of the left EAC. Her neurologic examination was otherwise unremarkable. Audiometry revealed bilateral symmetric low normal sensorineural hearing loss with normal acoustic reflexes.

Because of increasing pain and hypesthesia of the left face suggestive of a nervus intermedius neuralgia, a repeat MR scan (Fig. 1) was performed. An intracanalicular tumor characterized by high signal in T1-weighted MR and low signal on T2-weighted images was seen. The lesion in the internal auditory canal (IAC) show no enhancement on T1-weighted MR image after administration of paramagnetic contrast material (0.1 mmol/kg of gadolinium-DPTA). On CT scan (Fig. 1D), the lesion in the IAC appeared to be of low density measuring −50 to −40 Hounsfield units. The diagnosis of eighth nerve lipoma was entertained.

An incidental finding on T1-weighted precontrast MR images was a high-intensity lesion in the left petrous apex. Examination of the MR and CT together revealed a nonexpansile lesion consistent with a cholesterol granuloma.

Over the following 2 months, the patient had increasing complaints of pain originating from the left ear accompanied by tinnitus, visual blurring, and vertigo. Due to worsening neurologic symptoms, the patient underwent a suboccipital craniectomy with bony decompression of the IAC and biopsy of the lesion that was found to primarily involve the superior and inferior vestibular nerves.

The biopsied tissue contained predominantly adipocytes with a few ganglion cells, interspersed axons, and fibrous tissue. These histopathologic findings are consistent with an intraneural lipoma of the eighth nerve (Fig. 2) (5).

Postoperatively, the patient has had improvement in her left-sided headaches with resolution of vertigo, nausea, and vomiting. A postoperative unenhanced T1-weighted MR image through the region of the IAC showed reduction in the lipomatous mass. The patient was advised to seek dietary counseling as an adjunct to therapy, based on experience with fatty compression of the central nervous system and its response to diet (6, 7).

Discussion

Lipomas of the eighth cranial nerve are rare (1–3). The radiologic appearance of lipomas is characteristic, with high intensity on T1-weighted images, minimal postcontrast enhancement, and low intensity on T2-weighted images. Verification may come from the extremely low attenuation number in the lesion on CT scan.

Neurologic symptoms and signs due to these lesions are secondary to localized mass effect and compression of the seventh and eighth cranial nerves, the nervus intermedius, and the vascular structures that travel with these in the IAC. Seventh and eighth nerve pathology, combined with

Received August 6, 1991; accepted and revision requested August 29; revision received October 16.

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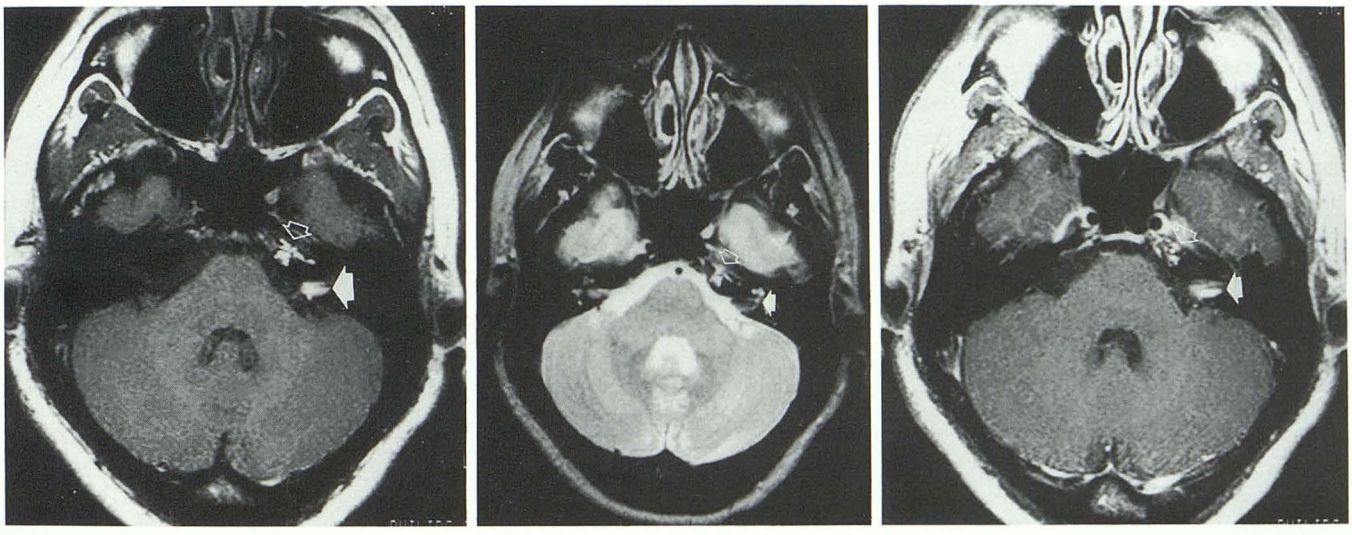
AJNR 13:1188–1190, Jul/Aug 1992 0195-6108/92/1304-1188

neuralgias of the nervus intermedius, demonstrated clinically by a positive Hitselberger sign and, described classically by Hunt in herpetic infections, localize the lesion to the IAC or CPA (8).

The etiology of intracanalicular lipomas remains speculative. It has been proposed that the lipoma arises during fetal development from maldifferentiation of mesoderm into lipocytes rather than arachnoidal cells (9). The viewpoint that the lipoma develops from hyperplasia or neoplastic change of fat cells that are normally present within the pia may explain the origin of these tumors in the IAC since the pia may extend as far out as 1 cm distal to the root entry zone of the acoustic nerve (10, 11).

Histopathologic similarities exist between IAC lipomas and spinal cord lipomas (12, 13). These include intermingled nerve fibers, adherence to neural structures via fibrous elements, and benign slow growth. Historically, attempts at total surgical extirpation of these lesions were associated with a poor neurologic outcome due to their hamartomatous nature. The presence of functional axons within the lipomatous mass dictates a more conservative surgical approach. The role of surgery should rarely, if ever, be for diagnosis, as these lipomas have a characteristic appearance on CT and MR scans. Instead, surgery for relief of neural compression is reserved for cases of progressive neurologic abnormality as in our patient, or those in which symptoms are unreponsive to medical therapy. Decompression of the IAC, neurotomy, and minimal excision of the lipomatous mass are recommended in order to avoid injury to the facial nerve and hearing.

The importance of a precontrast T1-weighted image cannot be overstated. In this case, the patient was transferred with the diagnosis of acoustic neuroma based on T1-weighted con-



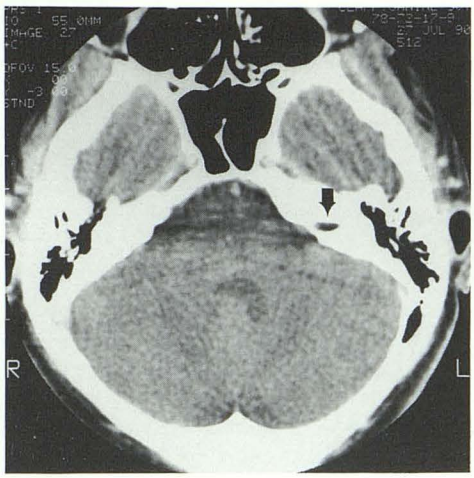


Fig. 1. Left intracanalicular lipoma seen best on MR with CT correlation.

A, High-intensity lesion in left IAC (*closed arrow*) on T1-weighted image 470/21/4 (TR/TE/excitations) also incidental high-intensity lesion of petrous apex (*open arrow*).

B, Lesion (*closed arrow*) is low intensity on T2-weighted MR image 2250/80/1 with petrous apex abnormally high signal (*open arrow*).

C, IAC (*closed arrow*) and petrous apex lesion (*open arrow*) showing no enhancement with administration of paramagnetic contrast material (Gadolinium-DPTA) on T1-weighted image (470/21).

D, Contrast-enhanced axial CT (W284/L34) showing low-attenuation mass in left IAC (*arrow*).

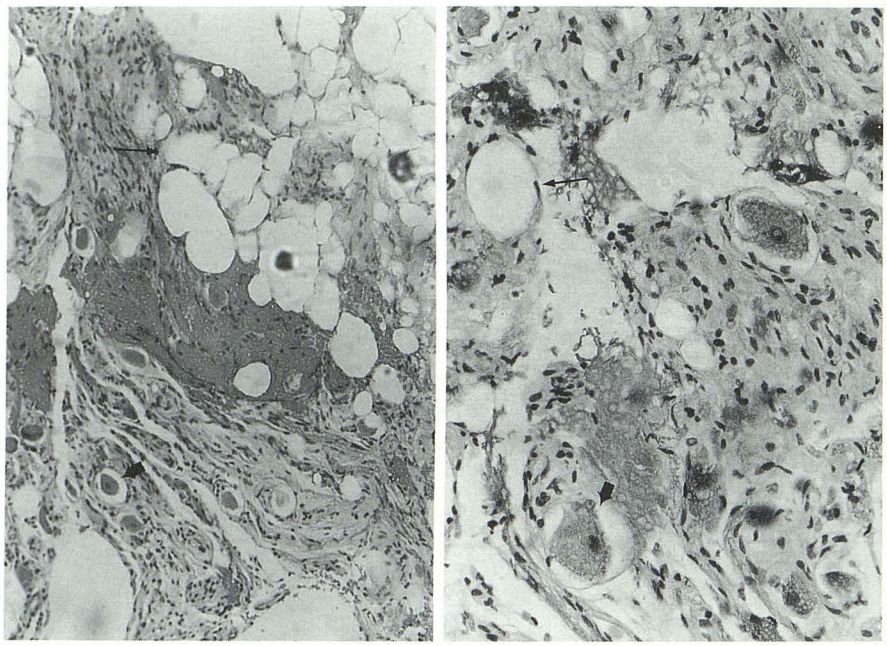


Fig. 2. *A,* Biopsy specimen of IAC lesion shows characteristics of lipoma with adipocytes (*long thin arrow*), ganglion cells (*short thick arrow*), and intermingled nerve fibers (hemotoxylineosin, 200×).

B, High magnification showing ganglion cells (*short thick arrow*), adipocytes (*long thin arrow*), fibrous elements of lipoma (hemotoxylineosin, 290×).

trasted sequence. The differential that must be considered includes residual pantopaque in the IAC and hemorrhage into a schwannoma or neuroma (14–16). Therefore, the full evaluation and diagnosis of these lesions should include a T1- and T2-weighted precontrast sequence, a T1-weighted postcontrast sequence and, if necessary, a CT with lesion density measurement.

References

1. Christensen WN, Long DM, Epstein JI. Cerebellopontine angle lipomas. *Human Pathol* 1986;17:739–743
2. Olsen JE, Glasscock ME, Britton BH. Lipomas of the internal auditory canal. *Arch Otolaryngol* 1978;104:431–436
3. Mattern WC, Blattner RE, Werth J, et al. Eighth nerve lipoma case report. *J Neurosurg* 1980;53:397–400
4. Hitsleberger WE, House WF. Acoustic neuroma diagnosis: external auditory canal hypesthesia as an early sign. *Arch Otolaryngol* 1966;3:218–221
5. Russell DS, Rubenstein LS. *Pathology of tumors of the nervous system.* 5th ed. Baltimore: Williams & Wilkins, 1989;706–708
6. Haddad SF, Hitchon PW, Godersky JC. Idiopathic and glucocorticoid-induced spinal epidural lipomatosis. *J Neurosurg* 1991;74:38–42
7. George WE Jr, Wilmot M, Greenhouse A. Medical management of steroid induced epidural lipomatosis. *N Engl J Med* 1983;308:316–319
8. Hunt JR. On herpetic inflammation of the geniculate ganglion: a new syndrome and its complications. *J Nerve Ment Dis* 1907;34:73–96
9. Sensening EC. The early development of the meninges of the spinal cord in human embryos. *Contrib Embryol* 1951;34:145–157
10. Schmid AH. A lipoma of the cerebellum. *Acta Neuropathol* 1973;26:75–80
11. Skinner HA. Some histologic features of cranial nerves. *Arch Neurol Psychiatry* 1931;25:355–372
12. Rogers HM, Long DM, Chou SN, et al. Lipomas of the spinal cord and cauda equina. *J Neurosurg* 1971;34:349–354
13. Ammerman BJ, Henry JM, DeGirolami V, et al. Intradural lipomas of the spinal cord. *J Neurosurg* 1976;44:331–336
14. Yonemitsu T, Niizuma H, Kodama N, Fujiwara S, Suzuki J. Acoustic neurinoma presenting as subarachnoid hemorrhage. *Surg Neurol* 1983;20:125–130
15. Terry RM. An unusual presentation of acoustic neuroma. *J Laryngol Otol* 1985;99:593–595
16. Lee JP, Wang ADJ. Acoustic neurinoma presenting as intratumoral bleeding. *Neurosurgery* 1989;24:764–768