CT and MR Imaging Manifestation of Lipochoristomas in Internal Auditory Canal: A case report

MING-TSUNG WANG1 JYH-CHING CHEN1 TSUNG-CHIA TSAI2 TAI-YOUENG CHEN2 WEN-SHENG TZENG2 CHEE-WAI MAK2 JEN-MING TSAI1 TAI-CHING WU2

Department of Radiology1, Kaohsiung Armed Forces General Hospital
Department of Radiology2, Yung Kung Campus, Chimei Medical Center

A 19-year-old woman presented with a history of right-sided hearing loss with ipsilateral tinnitus and fullness for months. Her audiogram revealed a sensorineural hearing loss in right ear with 56% discrimination and a speech reception threshold of 55 dB. Usually a speech reception threshold greater than 20 dB threshold level is considered as hearing impairment, either sensorineural, conductive or mixed cause. Computed tomography scan showed a 10 x 6 mm low density lesion measuring -30 Hounsfield units within the right internal auditory canal. Magnetic resonance imaging revealed that the lesion is of high signal intensity on T1-weighted images and intermediate signal intensity on T2-weighted images, both isointense to subcutaneous fat signal. The gadolinium-enhanced T1-weighted images demonstrated no obvious enhancement. The patient received tumor resection due to progressive symptoms and the pathologic result was lipochoristoma.

Key words: Computed tomography(CT); Internal auditory canal; Lipochoristomas; Lipoma; Magnetic resonance(MR)

Lipochoristomas are rare tumors of the acoustic nerve within the internal auditory canal (IAC) and sometimes the cerebellopontine angle (CPA), and are histogenetically believed to be congenital malformations. The histomorphologic and immunophenotypic evidence showed that these tumors are better characterized as choristomas than as simple lipomas, as they have been labeled in the past [1]. Intracranial lipochoristomas are rare tumors that develop from mesenchymatous cells and are presumably caused by aberrant differentiation of primitive meningeal matter [2-5] instead of a neoplastic process [4, 6, 7]. Histological analysis of these tumors shows a variable quantity of fibrovascular tissue [7], dissociation of the nerve fascicles, and a very intricate array of fat cells and myelinated fibers, giving these tumors a hamartomatous aspect [8].

Surgical treatment of IAC lipochoristomas carries a potential for substantial morbidity, including a very high risk of hearing loss and other more serious neurologic sequelae. Therefore, preoperative diagnosis and conservative follow-up is the best treatment [9, 10]. Surgery is indicated only when significant progressive or disabling symptoms are present. We report a lipochoristoma of the acoustic nerve within the IAC with radiologic appearance using magnetic resonance (MR) and computed tomography (CT) scan.

Case report
A 19-year-old woman presented with a history of right-sided hearing loss with ipsilateral tinnitus and fullness for months. Her audiogram revealed a sensorineural hearing loss in right ear with 56% discrimination and a speech reception threshold of 55 dB. An auditory brainstem response test was normal bilaterally. CT scan showed a 10 x 6 mm low attenuating lesion measuring -30 Hounsfield Units of the right IAC (Fig. 1a). MR imaging revealed that the lesion of right IAC presented as high signal intensity on T1-weighted
images (Fig. 1b), intermediate signal intensity on T2-weighted images (Fig. 1c), and no obvious enhancement on the gadolinium-enhanced T1-weighted images (Fig. 1d). On these imaging sequences, this lesion was always isointense to subcutaneous fat. An operation of middle fossa approach with transtemporal bone removal of the tumor was performed due to progressive symptoms. The histopathologic findings showed predominantly adipocytes with a few ganglion cells, interspersed axons and fibrous tissue (Fig. 1e), consistent with a lipochoristoma of the acoustic nerve.

DISCUSSION

In the previous English literatures, there had been only 90 cases of CPA or IAC lipochoristomas reported. In the past, lipochoristomas are usually mislabeled as lipoma in CPA or IAC. To our knowledge, the first case of a CPA lipochoristoma was found at autopsy in 1959 [11]. The author described a tumor that extended into the internal auditory canal and was associated with severe hearing loss on the affected site. The first surgically removed CPA lipochoristoma was described in 1974 [2]. The patient suffered from trigeminal neuralgia. Although the tumor was only partially resected, the patient’s symptoms resolved. Because of the infiltrating nature of the IAC lipochoristomas, it is important to differentiate these lesions from the more commonly found schwannoma. Imaging studies may assist the surgeon in making this distinction. The typical CT findings of a CPA lipochoristoma are a nonenhancing homogeneous, hypodense

![Figure 1](image-url)
lesion with attenuation values of -25 to -100 Hounsfield Units [12]. IAC lipochoristomas appear with high intensity on nonenhanced T1-weighted MRI studies, intermediate signal intensity on T2-weighted images, and a missing signal in fat suppression sequences [7, 13-17].

The bright signal on T1-weighted MR images scans helps to differentiate a IAC lipochoristoma from acoustic neuroma, which is hypointensity on T1-weighted images and more intense signal on T2-weighted images [14]. High T1-signal intensities within the CPA have also been reported for cavernous hemangiomas [18], cholesterol granulomas [19], and aneurysms [14]. It could be either due to blood product or cholesterol material, but would not be suppressed in fat suppression MR sequence. Hemorrhage into a schwannoma or neuroma should also be considered in the differential diagnosis [20, 21]. Therefore, a thorough evaluation and diagnosis of those lesions should include T1- and T2-weighted images, and a fat-suppressed contrast-enhanced T1-weighted images. T1-weighted images and fat-suppressed contrast-enhanced T1-weighted images are especially helpful in demonstrating the fat component within the lesion.

In conclusion, IAC lipochoristomas are infrequent benign tumors and conservative treatment is recommended. Diagnosis could be made on the basis of CT or MR images, showing typical fat density on CT scan, isointensity to fat in all MR sequence, and minimal or no postcontrast enhancement.

REFERENCES

内聰道脂肪迷離瘤在電腦斷層攝影及磁振造影之表現：病例報告

王明宗¹ 陈志程¹ 蔡宗佳² 陈秦源² 曾文盛² 参志辉² 蔡仁明¹ 吴泰清²

國軍高雄總醫院 放射線科¹
奇美醫學中心 放射線部²

內聰道脂肪迷離瘤非常罕見且為良性腫瘤，大部份為意外發現，若無顯著臨床症狀只須保守治療即可。此病灶在影像上有其特徵性。我們報告一年輕女性有顯著臨床症狀，電腦斷層發現在内聰道有一個脂肪密度的腫瘤。磁振造影呈現出T1高訊號，T2低訊號，在注射完顯影劑後並無顯著顯影劑增強現象。後來病人因症狀持續加劇而接受手術治療，病理組織為脂肪迷離瘤。

關鍵詞：電腦斷層，內聰道，脂肪迷離瘤，脂肪瘤，磁振造影