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Radiology in Focus

Magnetic resonance imaging of pleomorphic adenoma arising from the external auditory canal

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Abstract
Pleomorphic adenoma arising from the external auditory canal is a very rare neoplasm, and there has been no report on magnetic resonance (MR) imaging of pleomorphic adenoma of the external auditory canal. We report here a case of 65-year-old male with this tumour, measuring 12 mm in a diameter. Histopathology was confirmed from the specimen obtained at the surgical excision. MR revealed that the tumour had a well-defined margin showing hypointensity on T1-weighted images and hyperintensity on T2-weighted images relative to the parotid gland. The tumour was well enhanced by contrast material. No invasion to the surrounding tissue was observed. These MR findings were compatible with pleomorphic adenoma of the salivary gland origin. In treating pleomorphic adenoma of the external auditory canal, complete surgical excision is essential for the prevention of recurrence. It can be concluded that MR imaging is helpful for making a differential diagnosis of external auditory canal tumours and selection of adequate treatment.

Key words: Ear Canal; Adenoma, Pleomorphic; Magnetic Resonance Imaging

Case report

A 62-year-old man presented with a three-year history of mass in the right external auditory canal (EAC) and a feeling of aural fullness. He had no complaints that raised suspicion of malignant disease such as bleeding, hearing loss or facial palsy. On inspection, his right EAC was occupied by an elastic hard mass covered by a smooth normal skin. Fine needle-aspiration cytology revealed class II (adequate sample, benign tumour). There were no abnormal audiological and neurological findings relating to the EAC tumour.

MR imaging was obtained with a 1.5-T MR unit. Initially, unenhanced conventional spin-echo (SE) T1-weighted images (513/12 [TR/TE]; excitations, 2) and fast SE T2-weighted images without fat suppression (3600/96; excitations, 1) were obtained. Then, gadolinium-enhanced (0.2 mmol/kg) fat-suppressed T1-weighted SE images (700/13; excitations, 2) were obtained. MR imaging depicted a well-defined tumour located in the right EAC with a diameter of 12 mm (Figure 1). The tumour appeared hypointense on T1-weighted images (Figure 1(a)) and hyperintense on T2-weighted images (Figure 1(b)) relative to the normal parotid gland. It demonstrated heterogeneous enhancement post-contrast material injection and no cystic component was observed (Figure 1(c)). No invasion into surrounding tissue was observed.

Based on these clinical, cytological and radiological findings, a pleomorphic adenoma of the EAC was suspected and excision of the tumour was performed under general anaesthesia. In order to obtain good visualization of the tumour and to excise it with a wide margin, Lempert's incision was used combined with an endaural incision. While there was no apparent capsule between the tumour and EAC, it was possible to divide the tumour from the EAC and perform a complete dissection. Histopathologically, both of the glandular epithelial and pseudocartilaginous mesenchymal tissues were seen, and it was diagnosed as a pleomorphic adenoma of the EAC (Figure 1(d)).

Discussion

Normally pleomorphic adenomas arise in major or minor salivary gland tissue and are very rare in the EAC.[1] Regarding the origin of pleomorphic adenoma in the EAC, it is supposed that myoepithelial cells of the ceruminous apocrine glands differentiate to an eccrine structure to form most of the tissue components of a pleomorphic adenoma, i.e. fibrous, mucinous and chondroid material.[2] Tumours in the EAC of glandular structure origin include ceruminous adenomas, adenoid cystic carcinomas, ceruminous adenocarcinomas and pleomorphic adenomas.[2] Pleomorphic adenoma is the rarest of these tumours accounting for 10 per cent of EAC tumours of glandular origin,[2] and there have been only about 20 cases of pleomorphic adenoma of the EAC in the English literature.[3] Therefore, radiological information about pleomorphic adenoma of EAC is scarce, and thus the current MR findings added further insight into the radiological features of this tumour.

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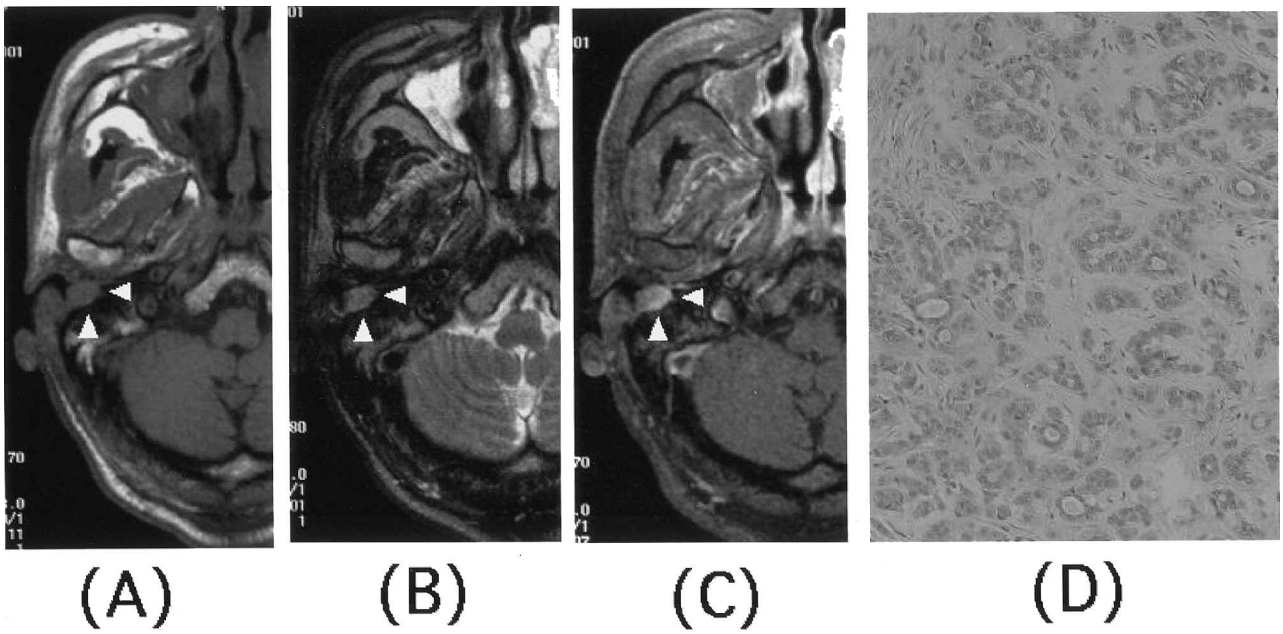

FIG. 1

Pleomorphic adenoma arising from a right external auditory canal. The tumour had a well-defined margin without invasion into surrounding tissues. The mass appears hypointense on T1-weighted image (a), hyperintense on T2-weighted image (b) and well enhanced by contrast material on fat-suppressed T1-weighted image (c). Histopathology revealed that the tumour contained both of the glandular epithelial and pseudocartilagenous mesenchymal tissues and was diagnosed as pleomorphic adenoma of the EAC (H & E; × 200) (d).

- **This paper reports a rare site of a pleomorphic adenoma arising from the external auditory canal**
- **The value of MR imaging is stressed and is said to be helpful in the differential diagnosis of external auditory canal tumours and the selection of adequate treatment**

The tumour in our study had a well-defined margin, and showed hypointensity on T1-weighted images and hyperintensity on T2-weighted images. The tumour was enhanced by contrast material. These MR features in contrast to high-grade malignant tumours[4,5] are compatible with benign tumours or low-grade malignancies.[4,6,7] On inspection, the tumour was covered by a normal skin appearing as a submucosal tumour. Fine needle-aspiration cytology was class II (adequate sample, benign tumour). Combined with these radiological, clinical and cytological findings, a pleomorphic adenoma of the EAC was suspected. The signal intensity in T2-weighted image of the current tumour is relatively low compared to a pleomorphic adenoma of major salivary gland origin. This is probably because the tumour in this study had a relatively high cellularity as revealed by post-operative histopathology (Figure 1(d)).

Pleomorphic adenoma is basically a benign tumour but has potential for malignant transformation and recurrence after inadequate treatment.[8] While there is no need for aggressive surgery combined with radiochemotherapy for pleomorphic adenoma, unlike that for the treatment of EAC carcinomas, complete excision with wide margin is necessary to prevent recurrence.[2] In order to avoid radical or inadequate surgery for pleomorphic adenoma of the EAC, MRI and cytological evaluation are recommended prior to surgery.

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