Case Report

Cystic Meningioma Imitating Vestibular Schwannoma at the Cerebellopontine Angle: Case Report

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Abstract

Cystic meningioma is a rare type of meningioma which is found mainly in the supratentorial region. The cystic nature of the mass can cause difficulty in the pre-operative diagnosis of these tumours. A 36-year old patient with a cystic meningioma at the cerebellopontine angle, a very rare location for this type of meningioma, is presented and discussed.

Keywords: Cystic meningioma, cerebellopontine angle

INTRODUCTION

Cystic meningiomas constitute only 1.7-11.7% of intracranial meningiomas (4,9,19,21,23,31). They are most frequently found in the cerebral convexity and parasagittal regions (6,9,14,23,24,27), only rarely occurring in the cerebellopontine angle. Solid meningiomas can easily be defined on computerised tomography and magnetic resonance imaging studies but cystic structures can cause diagnostic confusion (2,5,10,23). In this study, we report and discuss a patient with cerebellopontine angle cystic meningioma, which was thought to be a cystic schwannoma preoperatively.

CASE PRESENTATION

A 36-year old woman was referred to our department by an otolaryngologist because of decreased hearing. Neurological examination of the patient revealed decreased hearing acuity in the right ear and a mild left-sided hemiparesis. A head CT scan demonstrated a cystic mass in the cerebellopontine angle. MRI examination favoured a diagnosis of a cystic vestibular schwannoma (Figures 1a, 1b, 1c and 1d), also based on the clinical finding of decreased hearing acuity. Through a retrosigmoid approach, the patient was operated upon and cystic tumoural lesion, including the cyst wall, was removed. The cyst wall was removed because of its enhancement on MRI. No additional neurologic deficit occurred after the operation. Her postoperative course was uneventful and she was discharged on the fourth postoperative day. Histopathologic examination revealed a meningothelial-type meningioma. During the six-month period following her surgery, no complaints or neurologic problems have occurred, and her follow-up MRI at six months was normal.
DISCUSSION

Cystic meningiomas are relatively rare and have been found most often in the cerebral convexity or parasagittal areas. They constitute 1.7–11.7% of all intracranial meningiomas and are more common in children. MRI is the preferred diagnostic tool for cystic meningiomas and provides critical information regarding treatment. In case of cyst wall enhancement on MRI, total excision of the cyst with its wall is indicated. Reports of cystic meningioma cases have increased after the advent of CT and MRI. The cystic structure of the meningioma can cause diagnostic confusion, and the CT appearance may resemble a glial tumour, metastasis, or hemangioblastoma. MRI with gadolinium enhancement however, can distinguish cyst wall invaded by tumour cells (Type 2) from cyst wall composed of gliotic tissue without tumour infiltration (Type 3). The presence of a nodule of a cystic lesion close to the dura, and enhancement of the adjacent dura suggests the diagnosis of a cystic meningioma. Enhancing dural tails are observed in the majority of meningioma cases, but this finding is not specific for meningiomas. It may also be seen with benign lesions such as schwannoma, or with glioblastomas, parenchymal and dural metastases. Making an accurate preoperative diagnosis is essential for planning the treatment, and giving information about the prognosis of these patients. Occasionally, a certain diagnosis is only made after pathologic examination. Nauta et al. divided cystic meningiomas into four types: Type 1 are those with completely intratumoural cysts; Type 2 and 3 are peritumoural cysts, with tumour lining the cyst wall in Type 2 and not lining the cyst wall in type 3; and Type 4 have a cyst at the brain-tumour interface. On MRI, the cyst wall of Type 2 cystic meningiomas enhances, and that of

Figure 1: T2 weighed axial (1a), T1 weighed sagittal and coronal (1b and d) and axial contrast enhanced (1c) sequences demonstrate cystic tumour next to the internal auditory meatus. Complete removal of tumour is evident on postoperative MRI(1e). Histopathological examination revealed diagnosis of meningioma (1f, H&E, x40).
Type 3 does not enhance\(^{(31)}\). Surgical removal of the cyst wall is necessary in Type 2 cysts, but not in Type 3 cysts\(^{(15,31)}\). According to Nauta’s classification, patient presented here had a meningioma with Type 2 cyst, and removal of cyst wall was performed at the operation as indicated.

Necrosis is rare phenomena and meningiomas having necrosis are oftenly meningotheial (as in our case) or angioblastic type and have higher rate of atypia and recurrence\(^{(25)}\). Although some found no relation between cyst formation and histologic pattern\(^{(8,13)}\), as necrosis in one of the factors associated with cyst formation, atypia is seen more in cystic meningiomas than among meningioma in general\(^{(31)}\). Considering cyst types, intratumoral cystic meningiomas were more common in atypical types. Peritumoral cystic meningiomas were more common in meningotheial and atypical types\(^{(29)}\).

Besides ischemic central necrosis, may be a mechanism for the formation of Type 1 and 2 cysts\(^{(31)}\), meningioma cysts may form by cystic degeneration, intratumoural haemorrhage and subsequent cystic and necrotic changes, trapping of cerebrospinal fluid, evolution of peritumoural oedema into the cyst, active secretion of fluid by tumour cells, and fluid formation due to glial reaction and transudation\(^{(5,8,16,21,31)}\). Hemorrhage associated with meningioma is a rare condition and can be intratumoural, subarachnoid and subdural\(^{(11,17,22,30,32)}\). Cystic meningiomas have a higher incidence of hemorrhage as stated by Zee et al\(^{(31)}\) and tumoural hemorrhage.

**CONCLUSION**

Masses in the cerebellopontine angle having a cystic appearance may be cystic meningiomas. MRI imaging is better than CT scanning because it gives additional information about the cyst wall, and these results determine in part the surgical strategy.