

Case Report

Meningioma in the Lateral Cerebellomedullary Cistern without Dural Attachment

Seong Min Kim, M.D., Sung Sam Jung, M.D., Moon Sun Park, M.D., Ki Seok Park, M.D.

Department of Neurosurgery, Eulji University of College Medicine, Daejeon, Korea

A 59-year-old female presented with headache and dizziness for one year. Magnetic resonance imaging revealed a 52 x 28 mm, well-circumscribed, homogeneously enhancing mass lesion without dural attachment located in the left lateral cerebellomedullary cistern. The tumor was excised, and a histological diagnosis was a mixed pattern meningioma of meningothelial and fibroblastic type. A meningioma in the posterior fossa without dural attachment is quite rare. We report a rare case of lateral cerebellomedullary cistern meningioma without dural attachment with literature review.

KEY WORDS : Meningioma · Posterior fossa · Dural attachment.

INTRODUCTION

Meningiomas, usually attached to the dura, are thought to arise from arachnoid cap or meningothelial cells. Therefore, there is usual attachment of the tumor to the dural lining⁸⁾. Occasionally, meningiomas develop without dural attachment in some areas, including the intraventricular region, the pineal region, the subcortical region, and within the sylvian fissure^{5,12,16,18)}. Especially, meningiomas in the posterior fossa without dural attachment are extremely rare. In this study, the authors present a meningioma of the lateral cerebellomedullary cistern without dural attachment. To our knowledge, this is the second reported case. The first was reported in 1999 by Shibuya et al.²¹⁾.

CASE REPORT

A 59-year-old female presented with headache and dizziness for one year. On admission, no neurologic deficits were noted. Magnetic resonance imaging revealed a 52 ×

28 mm-sized mass lesion epicentered at the left lateral cerebellomedullary cistern and displacing the fourth ventricle contralaterally. The tumor was iso-intense on T1-weighted and heterogeneous on T2-weighted images. The lesion was clearly and homogeneously well enhanced with gadolinium, but no dural tail sign was noted. Left vertebral angiography showed marked right side displacement of the basilar artery and the tumor was stained by the left anterior and posterior inferior cerebellar artery complex (Fig. 1). A left lateral suboccipital craniotomy crossing the midline was performed and we removed the tumor observing the occipital and petrosal surface. Care was taken not to injure the lower cranial nerves, namely glossopharyngeal and vagus nerves, and the tumor was totally removed except for a tiny piece which severely attached to the brain stem. Any finding of dural attachment was not found. Although lower cranial nerves were dissected meticulously from the tumor and were preserved anatomically, she developed mild dysphagia postoperatively. But, it had completely resolved at 3 months after discharge. The postoperative imaging scan showed a near total resection of the tumor. The remaining tumor was seen at the left lateral medullary area (Fig. 2). Histologically, it was diagnosed as a mixed pattern meningioma of meningothelial and fibroblastic type (Fig. 3). Gamma Knife radiosurgery was performed for the residual tumor 6 months after surgery.

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• Address for reprints : Ki Seok Park, M.D.
Department of Neurosurgery, Eulji University College of Medicine,
1306 Dunsan-dong, Seo-gu, Daejeon 302-799, Korea
Tel : +82-42-611-3442, Fax : +82-42-611-3444
E-mail : ks3432@eulji.ac.kr

DISCUSSION

Meningiomas are thought to arise from arachnoid cap or meningotheial cells that not only cluster on the surface of pacchionian granulations, but also locate in the stroma of the choroid plexus, tela choroidea, and pia mater^{8,11,14,23}. The presence of arachnoid cap cells in arachnoidal, pial layers or other ectopic locations distinct from the dura mater may account for the rare cases of meningiomas without clear dural attachment that have been reported. According to sites of the tumor, supratentorial meningiomas without dural attachment are classified into 5 varieties, including intraventricular meningiomas, pineal region meningiomas, deep sylvian meningiomas, intraparenchymal or subcortical meningiomas, and others²⁴.

Intracranial infratentorial meningioma without dural attachment is very rare. Meningiomas of the posterior cranial fossa without dural attachment have been classified by Abraham and Chandu¹) into the following three categories : 1) meningioma arising from the choroid of the fourth ventricle and lying wholly within it; 2) meningiomas arising from the inferior tela and lying partially in the fourth ventricle and partially in the cerebellar hemisphere; and 3) meningiomas lying in the cisterna magna. However, Shibuya et al.²¹) added another one to this classification; meningiomas arising from the choroid plexus and lying in the lateral cerebellomedullary cistern.

Following this classification, only 35 cases of meningiomas of the posterior fossa without dural attachment have been reported in the literature. Among these 35 reported cases, 27 intraventricular meningiomas^{2,9,10,15,21,22}, four meningiomas arising from the inferior tela choroidea⁴), three meningiomas lying in the cisterna magna^{4,18}), and one meningioma in the cerebellomedullary cistern²¹). Preoperative diagnosis of posterior fossa meningioma without dural attachment is difficult. It should be differentiated from ependymoma and medulloblastoma²⁰). The characteristic neuro-radiological findings of posterior fossa meningioma without dural attachment are hyperdensity to the adjacent brain on CT, with smooth contours, good demarcation, and rare calcification¹⁷). In contrast, ependymomas demonstrate irregular enhancement and are markedly heterogenous due to calcification, hemorrhage, cystic components or necrosis²⁰). Medulloblastoma is a predominantly pediatric tumor commonly occurring in the cerebellar vermis^{6,7}). Meningiomas in this area represent challenging lesions, requiring special considerations because of the vicinity of the medulla, lower cranial nerves and vertebral artery³). Despite recent improvement in surgical techniques and technology, treatment of meningiomas in this area still carries a high risk of morbidity

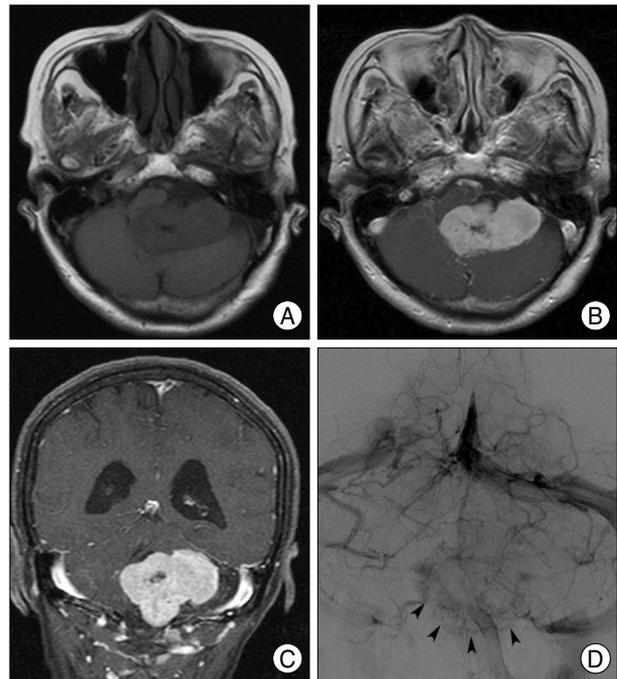


Fig. 1. T1-weighted axial image reveals a well-defined mass that is isointense with the brain (A). Contrast enhanced T1-weighted axial (B) and coronal (C) images reveal a well-circumscribed, homogenous mass with intense enhancement epicentered at the left lateral recess of the 4th ventricle with some extension to the left cerebellomedullary cistern. Tumor blush is observed on left vertebral angiography (black arrow) (D).

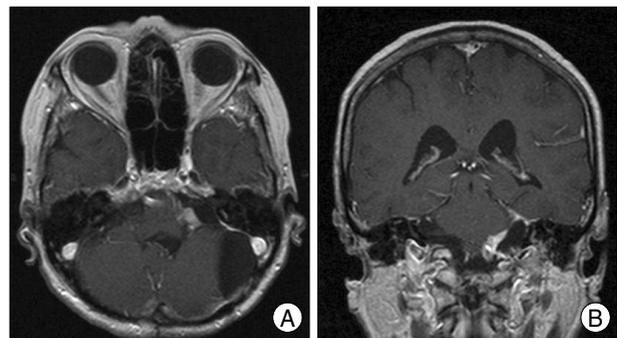


Fig. 2. Postoperative gadolinium enhanced axial (A) and coronal (B) magnetic resonance imaging scan demonstrating remaining small irregular enhancing portion attached to the left lateral medullary area.

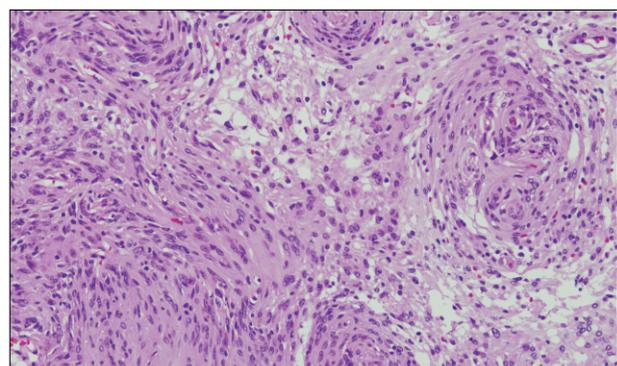


Fig. 3. Pathologic examination revealing a mixed pattern meningioma, consisting of meningotheial and fibroblastic tumor cells (H & E, $\times 200$).

and mortality¹³⁾, and surgical approach must be tailored to each patient. In our case, the tumor was not located within the fourth ventricle, and there was no connection of the tumor with the choroid plexus of the fourth ventricle. In addition, the tumor was not located in the cisterna magna. The tumor was connected only to the arachnoid tissue close to the foramen of the Luschka, suggesting that the origin of this meningioma was the arachnoid tissue in the cerebellomedullary cistern, as for deep sylvian meningiomas, or heterotopic tela choroidea¹⁹⁾.

CONCLUSION

According to the sites of the tumor, posterior fossa meningioma without dural attachment is classified into 4 categories. We report an extremely rare case of lateral cerebellomedullary cistern meningioma without dural attachment.

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