Surgical Management of Symptomatic Intrasellar Arachnoid Cysts
—Two Case Reports—

Tadashi MIYAMOTO, Daizou EBISUDANI, Katsushi KITAMURA, Tsutomu OHSHIMA*, Hidehisa HORIGUCHI**, and Shinji NAGAHIRO

Departments of Neurosurgery and **Pathology, Tokushima University School of Medicine, Tokushima; *Department of Neurosurgery, A-nan Kyoel Hospital, Tokushima

Abstract

Two patients with symptomatic intrasellar arachnoid cyst were successfully treated. A 67-year-old female with a cyst 20 mm in diameter developed headache and visual disturbance. She was treated by transsphenoidal surgery. A 59-year-old male with a cyst measuring 35 × 30 × 50 mm causing headache, visual disturbance, and deterioration of consciousness was managed by wide resection of the cyst wall via craniotomy. Postoperative courses in both patients were uneventful. Transsphenoidal surgery may be suitable for small to medium-sized cysts, although tight packing of the sella is mandatory to prevent leakage of cerebrospinal fluid. However, craniotomy is recommended for large intrasellar and suprasellar arachnoid cysts to avoid this complication, and to achieve sufficient communication between the cyst and the subarachnoid cistern.

Key words: symptomatic intrasellar arachnoid cyst, transsphenoidal surgery, craniotomy

Introduction

Intracranial arachnoid cysts occur as approximately 1% of all intracranial space-occupying lesions, and are usually located in the sylvian fissure, followed by the cerebellopontine angle, the supracollicular area, and the vermian area. Intrasellar arachnoid cysts form about 3% of all intracranial arachnoid cysts. We describe two cases of symptomatic intrasellar arachnoid cyst, treated by transsphenoidal and pterional approaches.

Case Reports

Case 1: A 67-year-old female visited our hospital complaining of headache in March 1996. Physical and neurological examinations found no abnormalities but magnetic resonance (MR) imaging revealed an intrasellar cystic mass compressing the optic chiasm. The cystic content appeared as isointense to the cerebrospinal fluid (CSF). The cyst wall was not enhanced. Corrected visual acuity was 0.9 on the right and 1.2 on the left. There was no apparent visual field defect and optic fundi were normal. Hormonal levels, including free-T3, free-T4, thyroid-stimulating hormone, prolactin, luteinizing hormone, follicle-stimulating hormone, growth hormone, adrenocorticotropic hormone, and cortisol, were within normal limits. Antidiuretic hormone was not examined.

Three months later, she developed progressive headache and visual disturbance. Corrected visual acuity was 0.8 on the right and 1.0 on the left. Repeat MR imaging demonstrated enlargement of the intrasellar mass (Fig. 1). The preoperative diagnosis was an intrasellar arachnoid cyst.

A transsphenoidal approach to excise the cyst wall was performed on July 12, 1996. CSF-like watery fluid was detected in the cyst and part of the cyst wall was excised. The pituitary stalk was observed through the roof of the cyst, but the roof was not opened to avoid CSF leakage. Tight packing of the pituitary fossa with muscle and fibrin glue was performed. The floor of the sella turcica was reconstructed with bony septum.

The postoperative course was uneventful, and her symptoms disappeared. Follow-up MR imaging re-
revealed decompression of the cyst (Fig. 2). Histological examination of the cyst wall demonstrated arachnoid membrane (Fig. 3).

**Case 2:** A 40-year-old male visited our hospital with headache in 1977. Physical and neurological examinations found no abnormalities but computed tomography (CT) revealed an intra- and suprasellar mass. He noticed sexual impotence in 1982 and right visual loss in 1991, but he refused an operation. He visited our hospital with symptoms of severe
headache, nausea, vomiting, and a confused state in 1996. Neurological examination revealed right visual loss, left temporal hemianopsia, and bilateral optic atrophy. Corrected visual acuity was 0.4 on the left. Hormonal examinations revealed panhypopituitarism, with a prolactin level of 4.5 ng/ml. MR imaging revealed a large dumbbell-type intra- and extrasellar mass with marked extension to the third ventricle, compressing the optic chiasm superi orly (Fig. 4). The cyst content was isointense with CSF, and the cyst wall was not enhanced except for the surrounding extended structures such as the pituitary gland and diaphragma sellae. The preoperative diagnosis was intrasellar arachnoid cyst with suprasellar extension.

A right frontotemporal craniotomy was performed on August 13, 1996. The cystic mass had severely compressed the optic nerve. The CSF-like cystic content was aspirated and the arachnoid-like cyst wall was resected.

After the operation, his headache and visual disturbance were markedly improved. Corrected visual acuity was 0.02 on the right and 1.2 on the left. Follow-up MR imaging revealed that the mass was reduced in size (Fig. 5). Histological examination was not performed.

**Discussion**

The pathogenesis of intrasellar arachnoid cysts remains controversial. The symptoms and neuroimaging findings of intrasellar arachnoid cyst are similar to other cystic masses in the sellar region, including cystic pituitary adenoma, craniopharyngioma, epidermoid cysts, and Rathke’s cleft cysts. The cyst wall of cystic pituitary adenomas and craniopharyngiomas is often enhanced by gadolin-
ium on MR imaging. The signal intensities of Rathke's cleft cysts and epidermoid cysts are different from that of CSF. However, these cysts are sometimes difficult to differentiate. CT, MR imaging, and CT cisternography are useful for the correct diagnosis, although CT cisternography was not performed in our patients. The intrasellar cysts in our cases were clearly depicted by MR imaging as extra-axial cysts with no internal architecture. The cyst wall was not enhanced and the cyst contents were isointense with CSF on all MR images. Recently, cine MR imaging and diffusion-weighted MR imaging have been introduced for preoperative diagnosis.

Intrasellar arachnoid cysts are usually treated by a transsphenoidal approach or a transcranial approach. Since 1972, 35 patients have undergone 36 surgical procedures (Table 1). The 17 males and 18 females were aged 17 to 76 years (mean 51.7 years). Twenty patients demonstrated visual disturbances and 16 demonstrated hypopituitarism. Thirty-one patients were treated by transsphenoidal surgery, and eight of these suffered surgical complications such as CSF rhinorrhea, infection, and blindness, and two died due to meningitis. Five patients with complications had a large cyst with a suprasellar extension. However, only one patient with no complications (2 patients were not reviewed) had a large cyst. The incidence of complications such as CSF rhinorrhea and meningitis was markedly high using the transsphenoidal approach for a large intrasellar arachnoid cyst. No complications were reported with the transcranial approach. The postoperative course was uneventful in our Case 1 because the roof of the cyst wall was not opened to avoid CSF leakage, and tight packing of pituitary fossa with muscle and fibrin glue was performed.

Surgical management of intracranial arachnoid cysts emphasizes the importance of fenestrating the

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**Table 1 Surgical approaches for cases of intrasellar arachnoid cysts**

<table>
<thead>
<tr>
<th></th>
<th>Transsphenoidal</th>
<th>Craniotomy</th>
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<tbody>
<tr>
<td>No. of procedures</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td>Age distribution (mean age)</td>
<td>17–76 yrs (50.5 yrs)</td>
<td>38–65 yrs (32.8 yrs)</td>
</tr>
<tr>
<td>Suprasellar extension</td>
<td>yes 6*</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>no 4*</td>
<td>0</td>
</tr>
<tr>
<td>Complications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSF rhinorrhea</td>
<td>8 (26%)</td>
<td>0</td>
</tr>
<tr>
<td>meningitis [abscess]</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>blindness</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Death</td>
<td>2 (6%)</td>
<td>0</td>
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</table>

*Twenty-one cases were not described. CSF: cerebrospinal fluid.
deep wall of the cyst to create communication between the cyst and the chiasmatic cistern, but we recommend the less invasive transsphenoidal approach rather than craniotomy for small intrasellar arachnoid cysts with tight packing of the pituitary fossa and without communication to a suprasellar arachnoid cistern. We recommend craniotomy for large intrasellar arachnoid cysts to avoid complications and to create communication between the cyst and the cistern. Packing of the pituitary fossa may be also necessary to avoid prolapse of the optic structures into the empty sellar cavity.

References


Address reprint requests to: T. Miyamoto, M.D., Department of Neurosurgery, Tokushima University School of Medicine, 3-16-15 Kuramoto-cho, Tokushima 770–8503, Japan.