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A case of intraventricular arachnoid cyst

How should it be treated?

Y. Kurokawa [1]*, T. Sohma [1], H. Tsuchita [1], K. Kitami [1], S. Suzuki [1], and A. Ishikawa [2]

[1] Department of Neurosurgery and [2] Department of Pediatrics, Sapporo City General Hospital, Sapporo, Japan

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Abstract. A rare case of arachnoid cyst in the trigone of a lateral ventricle is reported. The patient was an 8-year-old boy who had had four episodes of convulsions prior to admission. Computed tomography (CT) and magnetic resonance imaging (MRI) demonstrated a cystic lesion containing fluid resembling cerebrospinal fluid. Although he received a cyst-peritoneal shunt, the lesion did not decrease in size. Direct removal of the cyst was then scheduled. The entire cyst was finally removed, although it was firmly attached to the choroid plexus. The enlarged trigone gradually decreased in postoperative CT. The effectiveness of a cyst-peritoneal shunt is not always satisfactory. We recommend total resection of the cyst without use of a shunt system.

Key words: Arachnoid cyst – Intracerebral cyst – Computed tomography – Cyst-peritoneal shunt – Lateral ventricle

Arachnoid cyst of the lateral ventricle is thought to originate from a tela choroidea of the choroid plexus. A cyst-peritoneal shunt is accepted as the treatment of choice; however, this procedure did not bring about good results in our case. We performed complete removal of the lesion and achieved a satisfactory postoperative outcome.

Case report

The patient was born on 7 May 1979, without any perinatal problems. However, he experienced a first convulsion with a fever of 39 °C at 1 year and 6 months of age. At 3 years of age, he had another convulsive attack without fever. Thereafter, he was given anticonvulsant therapy by a pediatrician until he underwent a computed tomography (CT) examination, which revealed an abnormal cystic lesion in the right trigon in May 1987.

He was admitted to our department on 29 June 1987. Neurologically, he was alert, left-handed and had bilateral hyper-reflexia with no laterality. CT revealed a round, clearly demarcated low-density lesion with cerebrospinal fluid (CSF) density in the right trigone. A small contrast-enhanced area suggestive of a displaced choroid plexus was seen on the ventral surface of the low-density lesion (Fig. 1). CT cisternography showed this lesion to be independent of the ventricular system because there was no entry of contrast medium 1, 6 or 24 h after its injection (Fig. 2). A cyst-peritoneal shunt was applied on 20 August 1987. He was then followed up at our outpatient clinic and given anticonvulsants. He did not have any convulsions, although the electroencephalogram was still abnormal.

He was readmitted on 6 April 1988, because the cyst did not decrease in size. Ventriculography showed a large filling defect. Magnetic resonance imaging (MRI) showed a round mass lesion in the right trigon with CSF intensity on both T1- and T2-weighted images (Fig. 3). These findings suggested a malfunction of the shunt system. Removal of the cyst was attempted through a right parietal craniotomy on 12 April 1988. The thickened wall of the cyst was seen through the transventricular window. The tip of the ventricular catheter was located outside the cyst. The cyst gradually collapsed as the watery transparent fluid was suctioned out. The cyst wall was easily separated from the ependyma except for the portion of the choroid plexus, which was thought to be the origin of the cyst. The cyst was then totally resected. A shunt system was not constructed at this time. The postoperative course was uneventful. The enlarged right trigon gradually decreased in size (Fig. 4). Pathological examination of the cyst wall was compatible with an arachnoid membrane (Fig. 5).

Discussion

Arachnoid cysts are commonly located in the middle fossa, suprasellar area or posterior fossa but in some unusual cases, intrasellar [2], intraventricular [1, 4] and intracerebral locations [5] have been reported. Five cases of intraventricular arachnoid cyst in the lateral ventricle have been reported (Table 1) [7, 9–11]. All these cases received surgical treatment, and a pathological diagnosis was established. In three cases, the choroid plexus was confirmed to be the origin of the lesion. Intraventricular arachnoid cyst is easily diagnosed by conventional CT, although it must be differentiated from colloid cyst, epi-

* *Present address and address for offprint requests:* Department of Neurosurgery, Kushiro City General Hospital, Kushiro, 085 Japan

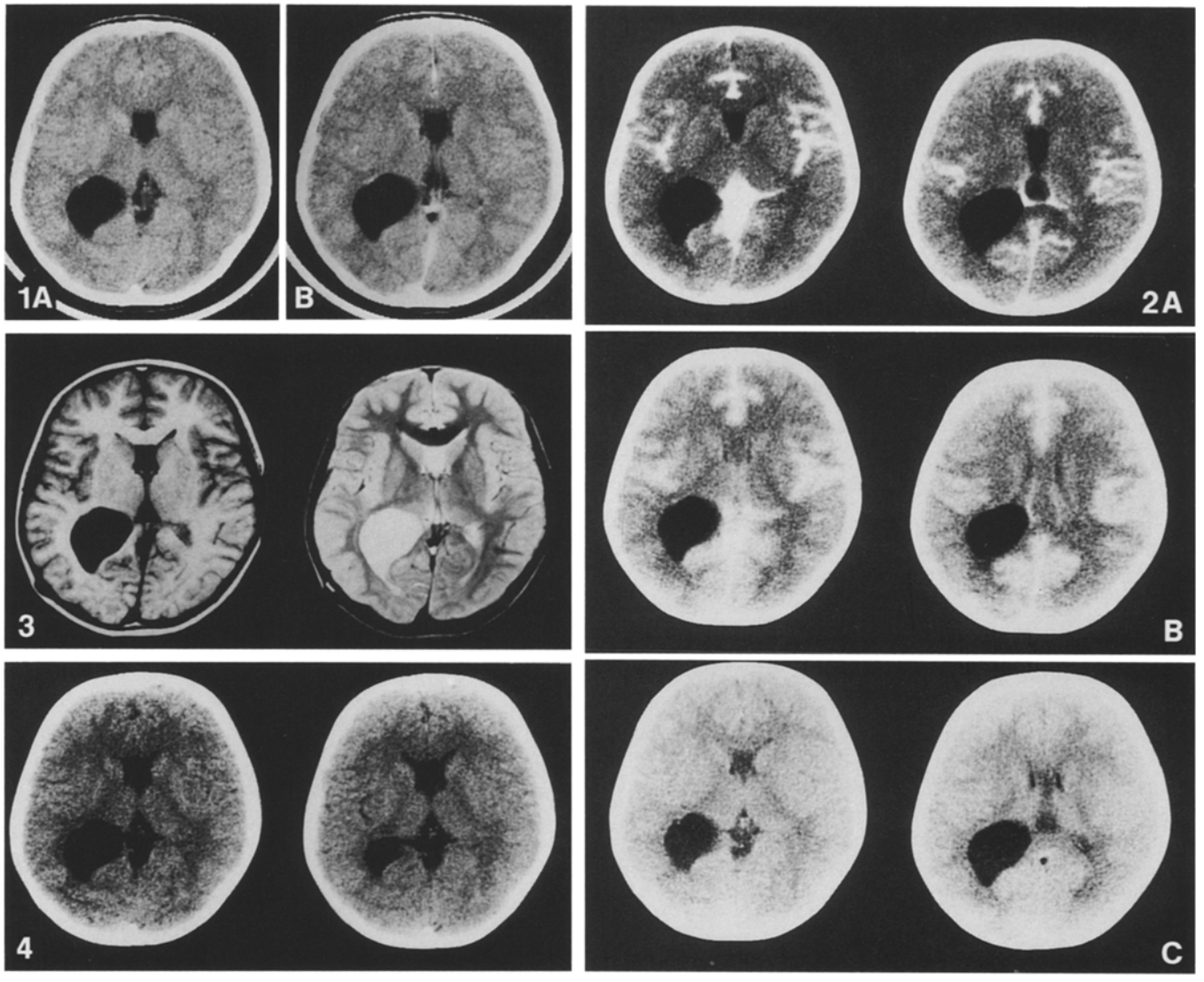

Fig. 1. **A** Preoperative computed tomography (CT) shows a large space-occupying lesion compatible with cerebrospinal fluid density in the right trigone. **B** A small contrast-enhanced area is seen in the ventral surface of the low-density lesion

Fig. 2A–C. CT was taken 1 (**A**), 6 (**B**) and 24 h (**C**) after intrathecal injection of a contrast medium, demonstrating no communication of the cyst to the ventricular system

Fig. 3. The lesion shows low intensity on the T_1-weighted image (WI) (*left*) and high intensity on the T_2 WI (*right*) on magnetic resonance imaging. The signal intensity of the lesion is compatible with cerebrospinal fluid

Fig. 4. The lesion is decreased in size on postoperative CT (*right*)

dermoid, ependymal cyst and cystic glioma. Kjos et al. [3] stressed the usefulness of MRI in the differential diagnosis of intracranial cystic lesions. They classified intracranial cystic lesions into three groups according to the T1 and T2 values of the cystic contents. From their results, arachnoid cyst showed a low protein pattern, different from that of colloid cyst, hemorrhagic cyst and nonhemorrhagic tumoral cyst. Seike et al. stressed that only an electron microscopic study could establish a definite diagnosis [9].

All five patients received surgical treatment, although one case is not described in detail. Two patients received partial resection of the cyst wall: one had an unsatisfacto-

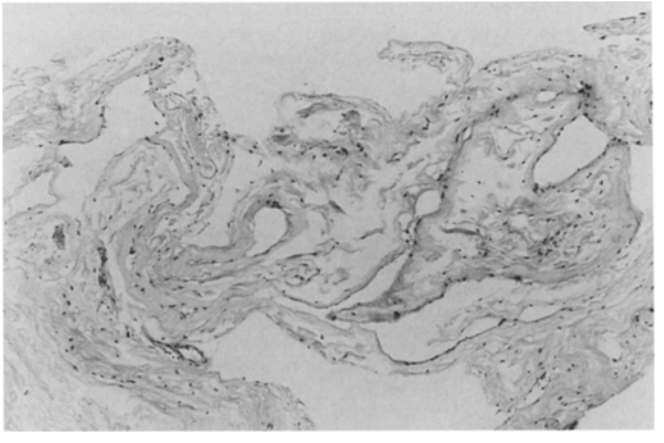

Fig. 5. The cyst wall is histopathologically a thick layer of arachnoid cells (hematoxylin and eosin stain, × 52)

Table 1. Summary of cases of intraventricular arachnoid cyst. CT, Computed tomography; MRI, magnetic resonance imaging; LD, low-density lesion; T_1 WI, T_1-weighted image; T_2 WI, T_2-weighted image

Author	Case (age, sex)	Clinical signs and symptoms	CT, MRI findings (cyst community)	Operative procedure (cyst attached to)	Postoperative change in cyst
Yeates and Enzmann 1979 [10]	Case 1 (20 years, male)	Headache; consciousness disturbance	LD in right trigone-posterior horn (no communication)	Not described (choroid plexus)	Not described
Yoshida et al. 1984 [11]	Case 2 (8 months, male)	Developmental delay; head enlargement	LD in left lateral ventricle	Partial resection of cyst wall	Decreased to a small extent
Seike et al. 1987 [9]	Case 3 (37 years, female)	Headache	LD in left trigone (no communication)	Partial resection of cyst wall (choroid plexus)	Not described
Nakase et al. 1988 [7]	Case 4 (36 years, male)	Headache; nausea	LD in right trigone (no communication)	Cyst fenestration	Decreased in size
Nakase et al. 1988 [7]	Case 5 (24 years, female)	Headache; nausea	LD in right trigone (no communication); low intensity on T_1 WI; high intensity on T_2 WI	Cyst-peritoneal shunt with cyst fenestration (choroid plexus)	Decreased in size
This report	Case 6 (8 years, male)	Seizure	LD in left trigone (no communication); low intensity on T_1 WI; high intensity on T_2 WI	Total removal of cyst (choroid plexus)	

ry result and the other is not described. One patient received cyst fenestration and the cyst subsequently decreased in size. One patient received cyst fenestration combined with cyst-peritoneal shunt, and the cyst decreased in size. Postoperative recurrence of the cyst was seen in 6 of 26 patients with intracranial arachnoid cysts treated by direct operation [6]. Nakasu et al. [8] summarized ten cases of histologically verified epithelium-lined intracerebral cysts, three of whom had a total of four recurrences after biopsy and/or drainage operation. Thus, Nakase et al. [7] concluded that cyst wall resection combined with cyst-peritoneal shunt should be the treatment of choice for intraventricular arachnoid cyst. Our emphasis is placed on the points that cyst-peritoneal shunt is not complete, and blind puncture of the cyst is sometimes dangerous, and it is difficult to place the catheter tip in a good position, as shown in the first operation in our case. We propose that the safest and most appropriate operative procedure for intraventricular arachnoid cyst is to remove the cyst completely without setting up a shunt system. This surgical procedure provides good results without further neurological deficits.

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