Diverticulum of the lateral ventricle causing cerebellar ataxia

Case report

Susumu Wakai, M.D., Junichi Narita, M.D., Kazumasa Hashimoto, M.D., and Masakatsu Nagai, M.D.

Department of Neurosurgery, Dokkyo University School of Medicine, Mibu, Tochigi, Japan

A case of ventricular diverticulum causing cerebellar ataxia is presented. Computerized tomography clearly demonstrated the aperture of the diverticulum in the medial wall of the trigone and its extension into the posterior fossa. The diverticulum regressed and the cerebellar ataxia disappeared after placement of a ventriculoperitoneal shunt.

Key Words • hydrocephalus • lateral ventricle • diverticulum • aqueductal stenosis • cerebellar ataxia • shunt

Ventricular rupture is known to occur spontaneously in cases of advanced obstructive hydrocephalus resulting in ventriculocisternostomy or diverticular formation. The former phenomenon, with spontaneous cure of hydrocephalus, was first reported by DeLange and the latter by Penfield, both in 1929. To date, 25 cases have been reported of diverticulum of the lateral ventricle extending into the posterior fossa. We are presenting a patient with this type of diverticular formation causing cerebellar ataxia. The pertinent literature is also reviewed.

Case Report

This 11-year-old girl was admitted to the neurological service on November 27, 1982, because of progressive visual loss, intermittent headache and vomiting, and gait disturbance. She had had a large head since childhood, but no mental retardation. Several months before admission, she suffered attacks of intermittent headache and her visual acuity gradually decreased. One week before admission, the patient developed gait disturbance, and her visual acuity in both eyes became reduced to counting fingers at a distance of 2 m.

Examination. The girl was well nourished and had a large head, which measured 61.8 cm. Visual acuity was 1/100 on the right and 4/100 on the left. Both optic discs were atrophic without papilledema. There was no nystagmus or diplopia. The limbs showed hypermetria and incoordination, more marked on the right than on the left side. Tendon jerks were not exaggerated, and plantar responses were extensor on both sides. Neurological examination was otherwise normal. Radiographs of the skull showed increased digital markings, a separated coronal suture, and an enlarged sella turcica. Computerized tomography (CT) disclosed marked dilatation of the third and both lateral ventricles, with diverticular formation in the medial wall of the left trigone. This diverticulum extended into the posterior fossa through the tentorial hiatus (Fig. 1).

Operations and Course. On the day of admission, a ventriculoperitoneal shunt was placed, with a Mishler high-pressure dual-chamber flushing valve and anti-siphon device.* Following shunt placement, the patient’s headache and vomiting resolved. Cerebellar ataxia improved greatly and finally disappeared. Metrizamide CT ventriculography performed on the day after the operation demonstrated that the cystic lesion seen in the tentorial hiatus and the posterior fossa was a diverticulum that communicated with the left lateral

* Mishler flushing valve and anti-siphon device manufactured by Heyer-Schulte Corp., 5377 Overpass Road, Santa Barbara, California.
ventricle (Fig. 2). The hydrocephalus was revealed to be caused by stenosis of the aqueduct (Fig. 3). One week later, the flushing device was exchanged for a medium-pressure device because the patient's visual acuity had not improved. After the second operation, her visual acuity gradually improved. A CT scan taken 1 week later showed regression of the diverticulum (Fig. 4). Thereafter, the patient developed subdural hematoma on the right side, and underwent irrigation of the hematoma cavity on January 14, 1983. She is now doing well except for persistent visual problems.

**Discussion**

Spontaneous ventriculostomy or diverticular formation have been documented to occur in the anterior and posterior walls of the third ventricle, in the medial wall of the trigone, and at other sites of the lateral ventricle. Sites and types of ventricular rupture reported in the literature are summarized in Table 1. Regarding the lateral ventricle, these phenomena usually occur in the medial wall of the trigone (the floor of the ventricle) which lies between the forward-sweeping crus of the fornix and the forceps major. In the present case, CT scanning clearly demonstrated the aperture of the diverticulum at this site (Fig. 1). The CT picture in our case may be characteristic for the diverticular formation of the lateral ventricle in the case of advanced hydrocephalus, although no similar picture on CT has been available in the literature.

A diverticulum at this site frequently extends through the tentorial hiatus down to the posterior fossa, and compresses the cerebellum. Nevertheless, clinically overt cerebellar ataxia develops only in rare occasions. Furthermore, the disappearance of this symptom after surgery has been documented in only one previous case. Many of the previously reported cases of ventricular diverticulum were treated by direct surgery of the mass. However, only two patients improved following surgery. We consider that a shunting operation is less dangerous and more effective than a direct approach. In our case, the diverticulum regressed on subsequent CT monitoring and the cerebellar ataxia disappeared after placement of a ventriculoperitoneal shunt.

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**Fig. 1.** Computerized tomography scans taken at admission after contrast infusion. The third and both lateral ventricles are markedly dilated, but the fourth ventricle is normal in size (arrowhead in A). A cystic lesion is seen in the posterior fossa (B) and at the tentorial hiatus (C and D). This lesion has a communication with the left lateral ventricle through the aperture in the medial wall of the trigone (arrows in D).

**Fig. 2.** Metrizamide computerized tomographic ventriculography taken on the day after placement of the ventriculoperitoneal shunt. Communication between the left trigone and the cystic lesion (ventricular diverticulum) is visualized (arrowheads).

**Fig. 3.** Metrizamide ventriculography demonstrating complete occlusion of the aqueduct of Sylvius.

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Fig. 4. Computerized tomography scans taken 1 week after operation. The fourth ventricle and quadrigeminal cistern can be seen normally instead of the ventricular diverticulum, which occupied the area previously (A, B, and C). D: Marked regression of the diverticulum is seen (arrows). Arrowhead indicates the quadrigeminal cistern.

Acknowledgment

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References

5. De Lange C: Spontaneous healing in a case of hydrocephalus. Proc R Acad Amsterdam 32:78–85, 1929

TABLE 1
Sites and types of ventricular rupture reported in the literature*

<table>
<thead>
<tr>
<th>Site of Ventricular Rupture</th>
<th>Ventriculocisternostomy</th>
<th>Ventriculocisternostomy</th>
<th>Diverticulum</th>
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<tbody>
<tr>
<td>lateral ventricle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>medial wall of trigone</td>
<td>10</td>
<td>0</td>
<td>264, 1, 4, 6, 8, 14, 18, 19, 21, 23, 26, 28, 29, 31</td>
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<tr>
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<tr>
<td>third ventricle</td>
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<tr>
<td>lamina terminalis</td>
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<td>floor</td>
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<tr>
<td>posterior wall</td>
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<td>0</td>
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</tr>
<tr>
<td>roof</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>aqueduct of Sylvius, ventricle side</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>total cases</td>
<td>14</td>
<td>3</td>
<td>51</td>
</tr>
</tbody>
</table>

* Superscript numbers are reference numbers. Ref. 9: ventriculocisternostomy with a diverticulum in the posterior third ventricle. Ref. 24: ventricular rupture into the subarachnoid as well as subdural space. Ref. 30: small aperture in the diverticulum. Ref. 31: diverticulum in both the lateral and third ventricle.
† Our case was included in this group.

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Address reprint requests to: Susumu Wakai, M.D., Department of Neurosurgery, Dokkyo University School of Medicine, Mibu, Tochigi, 321-02, Japan.