Neuroendoscopic Fenestration for Entrapped Temporal Horn After Surgery: Report of 3 Cases

Bin Zhang, Xinsheng Wang, Chuzhong Li, Zhong Li

Key words
- Focal hydrocephalus
- Neuroendoscopy
- Trapped temporal horn

Abbreviations and Acronyms
CSF: Cerebrospinal fluid
MRI: Magnetic resonance imaging

Neurosurgery Department, Beijing Tiantan Hospital, Capital Medical University, Beijing, China

To whom correspondence should be addressed: Bin Zhang, M.D. [E-mail: lion822zb@163.com]

Citation: World Neurosurg. (2018) 112:77-80.
https://doi.org/10.1016/j.wneu.2018.01.096

Journal homepage: www.WORLDNEUROSURGERY.org

Available online: www.sciencedirect.com

BACKGROUND: **The postoperative ventricular adhesion after resection of central nervous system tumors can obstruct physiologic cerebrospinal fluid (CSF) circulation and cause temporal horn entrapment. The surgical goal is to restore physiologic flow of CSF. The authors reviewed their database to report their experience with endoscopic fenestration for treating entrapped temporal horn caused by atrial adhesions. All endoscopic operations performed from February 2015 to December 2016 were reviewed.**

CASE DESCRIPTION: **Three patients developed temporal horn entrapment after tumor resection. Fenestration was successful in all patients, with a subsequent stomy of the septum pellucidum. Follow-up magnetic resonance imaging 1 year later showed a patent reduction of the entrapped horn.**

CONCLUSIONS: **Endoscopic fenestration is an option in the treatment of entrapped temporal horns. However, more experience is required to recommend it as the treatment of choice.**

Temporal horn entrapment is a rare form of noncommunicating focal hydrocephalus that has been described as a result of meningitis, ventriculitis, intraventricular neurocysticercosis, hydatid cysts, neurosarcoidosis, intraventricular hemorrhage, intraventricular arachnoid cysts, and fibrosis after surgery for different pathologies (tumors and vascular malformations) involving the trigone of the ventricle.[1-4] In cases of entrapment caused by postoperative adhesion after resection of central nervous system tumors, reconnection to the cerebrospinal fluid (CSF) pathway by the fenestration of the adhesion should be attempted. We report our experience with endoscopic fenestration in the trigone of the ventricle.

METHODS

We retrospectively reviewed the cases of temporal horn entrapment treated by endoscopic surgery at our hospital from February 2015 to December 2016. Patient demographics, medical charts, and images were reviewed.

Operative Technique

The patient was placed on the operating table in a lateral decubitus position with the entrapped temporal horn side up. A magnetic frameless neuronavigation system was used (Stealth Station; Medtronic, Minneapolis, Minnesota, USA) to design the optimal trajectory. The ideal fenestration site was selected on T2-weighted magnetic resonance imaging (MRI) by selecting the obstruction in the trigone area. The entry point was on the thin cortex of the temporal lobe. The endoscope was introduced under navigational guidance into the trigone region. A Lotta ventriculoscope (Karl Storz, Tuttlingen, Germany) was used for inspection of the atrial choroid plexus and adhesions in the trigone area. Navigation was helpful for confirming that adhesions had caused temporal horn entrapment. Initially, the choroid plexus of the atrium was identified as a landmark. Normally, the adhesions were near the choroid plexus. The initial separation was sharply dissected using scissors. Once the adherent scars were dissected, the fenestration was enlarged with the aid of a 3-French Fogarty balloon catheter. The endoscope was progressed, and the septum pellucidum was identified. The stomy on the septum pellucidum was performed using bipolar coagulation and forceps to create a communication to the contralateral lateral ventricle. After a sufficient stomy size was achieved, the endoscope was removed, the bur hole defect was filled with gel foam, and the skin was closed.

RESULTS

Three patients were identified (2 female and 1 male). They all developed temporal horn entrapment after ventricular tumor resection, including 2 neurocytomas and 1 anaplastic meningioma. The endoscopic fenestrations in the trigone of the ventricle were made on all patients. No new neurologic deficit or deterioration was observed in any of the patients after the procedure. No significant hemorrhage was encountered.

CASE REPORTS

Case 1

A 28-year-old man experienced a sudden headache 2 years after the resections of the right ventricular neurocytoma (Figure 1A). He also was vomiting and exhibited a gait disturbance. The head MRI and computed tomographic scan showed a dilated right temporal and occipital horn (Figure 1B, C). The adhesion seemed to be near the corpus callosum body. During the surgery,

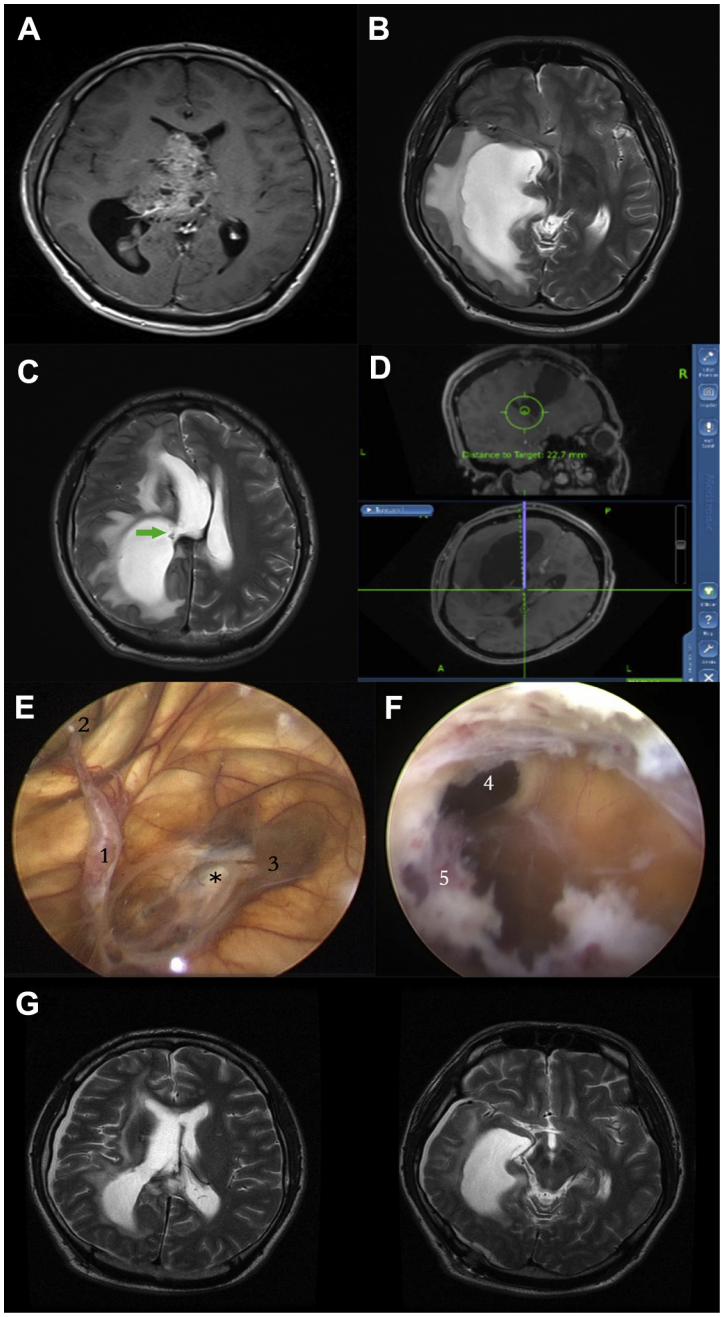

Figure 1. Case 1. (**A**) Axial magnetic resonance imaging (MRI) i showing the right ventricular neurocytoma. (**B**, **C**) Axial T2-weighted MRI shows the dilated temporal horn after 1 year of operation. The *green arrow* indicates the selected spot chosen to perform the fenestration. (**D**) The neuronavigation guided to the adhesion and pellucidum. (**E**) Intraoperative endoscopic images show choroid plexus (*1*), dilated temporal horn (*2*), atrium (*3*), and the adhesion (asterisk). (**F**) After the endoscopic septostomy, the contralateral ventricle, the foramen of Monro (*4*), choroid plexus (*5*) can be viewed. (**G**) Axial T2-weighted MRI obtained 1 year after surgery, showing a smaller temporal horn.

the adhesion near the choroid plexus on the atrium was found and fenestrated. The stomy of the septum pellucidum was also performed (Figure 1F). After the operation, the patient's symptoms of increased intracranial pressure resolved completely. MRI 12 months after endoscopic surgery showed a patent reduction of the entrapped horn (Figure 1G).

Case 2

A left ventricular tumor was diagnosed in a 27-year-old woman with a sudden headache (Figure 2A, B). A left frontal craniotomy was performed, and the tumor was removed successfully. The pathology showed neurocytoma. She received radiotherapy. After 1 year, she was exhibiting right hemiparesis, memory loss, and dizziness. The head MRI and computed tomographic scan showed a dilated left temporal horn (Figure 2C, D). The membrane of adhesion near the septum pellucidum was fenestrated under the endoscopic surgery. The stomy of the septum pellucidum was also performed. The patient's dizziness resolved completely after the operation. At 12-month follow-up, MRI showed stable radiologic findings (Figure 2C, D), and the patient retained slight memory loss.

Case 3

A 32-year-old woman underwent an operation to remove a meningioma located on the left atrium. Three years later, she was admitted with a severe headache and vomiting. Head MRI showed a dilated left temporal and atrium with a small recurrent meningioma (Figure 3A, B). An endoscopic surgery of the left ventricular trigone was performed. The recurrent tumor was removed, and the membrane obstructing the CSF pathway near the atrium was fenestrated. After the surgery, the patient's symptoms were relieved. Follow-up MRI after 1 year showed a patent reduction of the entrapped horn (Figure 3C, D).

DISCUSSION

Entrapment of the temporal horn is a rare subtype of isolated hydrocephalus; it is usually caused by obstruction in the trigone area of the lateral ventricle. The mass effect of the dilated temporal horn over the surrounding structures produces the clinical syndrome. Signs and symptoms can include headache, seizures, hemiparesis, or visual field deficits.[1,4-6] To date, standard treatment has not been established. Different options are available to treat this kind of isolated