Endoscopic cystoventriculostomy of an arachnoid cyst using a neuroendovascular stent to maintain patency

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Introduction

Arachnoid cysts have a prevalence of about 1% of all intracranial masses. Symptomology includes headache, increasing head circumference, visual loss, development delay, seizures, and focal neurological defects.1 Treatment may be indicated in pediatric patients with raised intracranial pressure, neurological deficits, and macrocephaly. Endoscopic cyst fenestration has become popular recently as a minimally invasive method to establish a communicating pathway between the cyst and the normal CSF pathways with a lower complication rate compared to the open surgical treatment.1

Discussion

To our knowledge, this is a rare, yet successful report of an arachnoid cyst cystoventriculostomy where a neuroendovascular stent was used to maintain patency of the pathway. In symptomatic cases, image-guided cyst fenestration may be beneficial. Surgical treatments include craniotomy and microsurgical cyst fenestration, endoscopic cyst fenestration, cystoperitoneal shunting and ventriculostomy.1,2,3 Cystoventriculostomy is used for convexity arachnoid cysts.1,3 Conduits are rarely required in the management of arachnoid cysts. Neuroendovascular stent placement may be a useful adjunct to maintain patency of a cystoventriculostomy preformed for symptomatic arachnoid cysts.

Conclusion

Our patient presented with a large para-axial arachnoid cyst, refractory to traditional surgical or endoscopic procedures. Placement of a neuroendovascular stent allowed for improvement in symptomology and continued resorption of excess CSF resulting in decreased cyst dimensions in the years following the surgery.

References


Case Report

Case: A 6½-year-old male with medication refractory tonic-clonic seizures, and a large right convexity fronto-temporoparietal arachnoid cyst and two failed prior interventions including a cystoperitoneal shunt (Figure 1). Symptoms included left spastic hemiparesis and facial weakness. An endoscopic approach using a Decq neuroendoscope (KARL STORZ GmbH & Co. KG) was used for cyst access (Figure 3). A cystoventriculostomy was performed with a 3F Fogarty balloon. A nitrol self-expanding Wingspan stent (4x15 mm, flexible over-the-wire) was inserted. The patient showed both symptomatic and imaging improvement following the procedure. At four years’ post-procedure, the patient reported a significant decrease in seizure frequency. Imaging showed a decrease in the dimension of the cyst and a marked improvement of the prominence of the gyral-sulcal pattern (Figure 2).

Figure 1: CT scan of the head showing large right convexity arachnoid cyst with existing cystoperitoneal shunt.

Figure 2: MRI of the brain 4 years post-op.

Figure 3: Endoscopic pictures of stent assisted cystoventriculostomy.

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