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Chronic subdural haematoma after endoscopic treatment of a suprasellar arachnoid cyst

P. N. KARAMANAKOS, J. VARIS, A. RONKAINEN, T. KOIVISTO, J. RINNE and J. E. JAASKELAINEN
Department of Neurosurgery, University Hospital of Kuopio, Kuopio, Finland

Abstract

Neuroendoscopy is considered a safe treatment option for intracranial arachnoid cysts. However a variety of complications has been reported after such interventions. Here we present the first case of a chronic subdural hematoma two months after the combined treatment of a supracellar arachnoid cyst with endoscopic third ventriculostomy and cyst fenestration.

Key words: Chronic subdural haematoma; endoscopic third ventriculostomy; fenestration; intracranial arachnoid cysts; neuroendoscopy; suprasellar.

Introduction

Intracranial arachnoid cysts (IACs) are benign lesions that contain CSF-like fluid encased and compacted by arachnoid membrane. They constitute some 1% of all intracranial masses, but MRI has increased their incidence (Daneyemez *et al.*, 1999). Arachnoid cysts are often incidental but may also cause neurological symptoms due to mass effect. Surgical treatment aims to drainage of IACs, by inserting a cystoperitonel shunt (Arai *et al.*, 1996) or by canalizing them into ventricles or cisternal CSF spaces through neuroendoscopy (Hopf and Perneczky, 1998) or craniotomy (Lange and Oeckler, 1987). Neuroendoscopy is generally a safe mini-invasive technique (Bauer and Hellwig, 1994). However, a spectrum of various unusual complications has been reported after neuroendoscopic procedures (Handler *et al.*, 1994; Teo *et al.*, 1996; Hopf *et al.*, 1999; Schroeder *et al.*, 1999). Here we present a case of chronic subdural hematoma (CSDH) two months after endoscopic third ventriculostomy (ETV) and fenestration of a suprasellar arachnoid cyst that caused obstructive hydrocephalus.

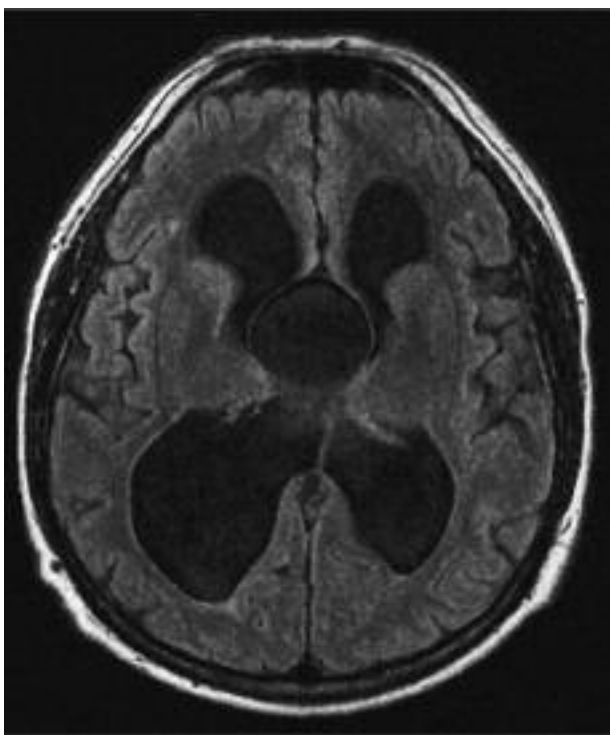

FIG. 1. — Axial T1-weighted MR image demonstrating a suprasellar arachnoid cyst indenting the third ventricle and producing obstructive hydrocephalus.

Case report

A 57-year-old man with a 6-year history of symptoms caused by undiagnosed hydrocephalus was admitted to our department. He had impaired short-term memory, urinary incontinence and atactic gait with spastic limbs. MRI showed a suprasellar arachnoid cyst indenting the third ventricle and producing obstructive hydrocephalus with a ballooned third ventricle and a normal fourth ventricle (Fig. 1).

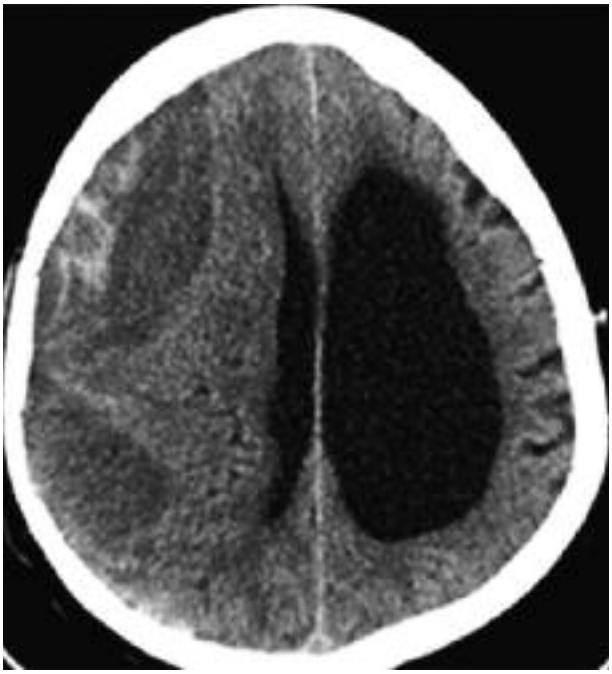

FIG. 2. — Brain CT two months after endoscopic treatment of the suprasellar arachnoid cyst, demonstrating a right side CSDH with compression of the ipsilateral ventricle and some midline shift.

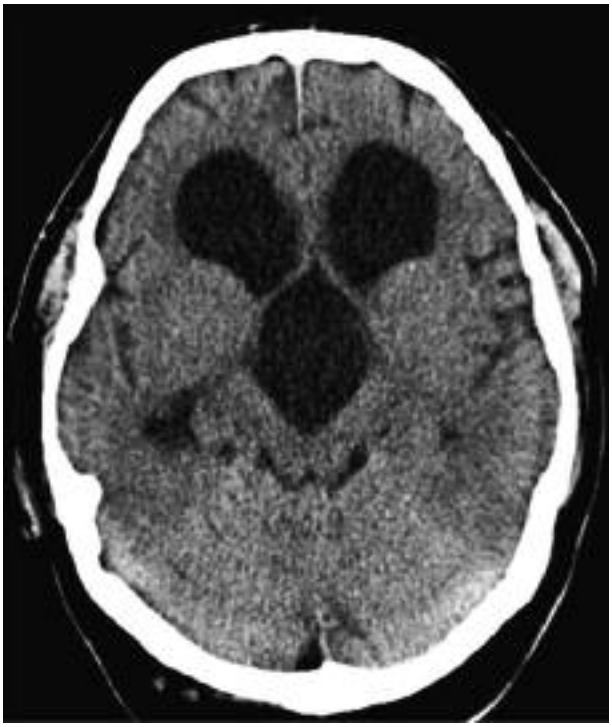

FIG. 3. — Follow-up CT four months after the endoscopic procedure showing no signs of improvement of the triventricular hydrocephalus.

Fenestration of the cyst and ETV were performed under general anaesthesia through a right frontal burr hole using a 3.8 mm rigid endoscope. Recovery was uneventful and the patient returned home after three days.

After initial improvement, he developed headache and weakness of the left lower limb. At two months after endoscopy, CT disclosed a right chronic subdural haematoma (Fig. 2), which was drained through a right parietal burr hole. He was discharged after 2 days with improving monoparesis. However, symptoms of hydrocephalus re-appeared, and at four months CT showed that triventricular hydrocephalus insisted (Fig. 3). Increased ICP was demonstrated in 24-hour ICP monitoring through a ventricular catheter, and a ventriculoperitoneal shunt with a programmable valve, set at 70 cm H_2O, was inserted. Incontinence disappeared and gait remarkably improved, with partial improvement of memory.

Discussion

Neuroendoscopic procedures have gained worldwide acceptance and applications in neurosurgery (Oi, 1996). Among other indications, neuroendoscopy can be applied for the treatment of IACs. The use of endoscopy to create communications between the cyst and the ventricular system and/or cisternal CSF spaces, sometimes followed by ETV, is an attractive alternative to shunt placement or microsurgery (Hopf and Perneczky, 1998; Choi *et al.*, 1999; Fitzpatrick and Barlow, 2001). Neuroendoscopic procedures are generally considered safe, while a number of various infrequent complications have been reported (Sgaramella *et al.*, 2003). CSDH or subdural hygroma, a known complication of extracranial shunting for hydrocephalus, is rarely reported after neuroendoscopy. The reported occurrence of CSDHs or subdural hygromas after ETV varies from 0 to 3.8% in large series (Jones *et al.*, 1994; Beni-Adani *et al.*, 2000; Macarthur *et al.*, 2001; Freudenstein *et al.*, 2002; Schroeder *et al.*, 2002, 2004; Santamarta *et al.*, 2005), while only 3 cases of a subdural collection after endoscopic treatment of IACs have been reported (Beni-Adani *et al.*, 2000; Freudenstein *et al.*, 2002; Kurschel *et al.*, 2007).

To our knowledge, we present the first case of a CSDH after treatment of a suprasellar arachnoid cyst with cyst fenestration and ETV. The haematoma, causing a focal neurological deficit, was evacuated through a burr hole. The development of the haematoma apparently relates to surgical manipulation, being on the same side as the endoscopic

trajectory. We believe that loss of CSF was a contributing factor although we used a small diameter endoscope with continuous Ringer irrigation. In long-standing triventricular hydrocephalus, as was the case with our patient, pronounced drainage of CSF due to combination cyst fenestration and ETV may increase the subdural space. In addition, absorptive mechanisms may have needed days to adapt to handle CSF that was entering subarachnoid spaces through ETV and cyst fenestration, and CSF may have escaped through a pathway of least resistance into the subdural space (Teo, 2004). Bleeding from a cortical vessel or bridging vein or even from a scalp vessel may have been the cause of haemorrhage into the enlarged subdural space. Finally, progressive decrease of the ventricular volume due to functioning ETV and constant filling of the subdural space through the cortical tract may have contributed to the persistence and progression of the subdural collection.

In conclusion, change of CSF dynamics due combined effects of endoscopic cyst fenestration and ETV for hydrocephalus must have predisposed our patient to CSDH. In retrospect, and since the patient's hydrocephalus was not requiring urgent treatment, reserving ETV for the occasion of failure of cyst fenestration, might had decreased the risk of CSDH.

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Petros N. Karamanakos,
Department of Neurosurgery,
University Hospital of Kuopio,
Puijonlaaksontie 2,
SF-70211 Kuopio (Finland).
E-mail: me00188@cc.uoi.gr
petros.karamanakos@kuh.fi