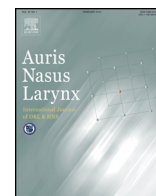




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Endoscopic resection of intranasal meningo-encephalocele accompanying meningioma



Ching-Hui Hsu, Chin-Fang Chang, Yao-Lung Tsai, Mu-Kuan Chen*

Department of Otorhinolaryngology, Head and Neck Surgery, Changhua Christian Hospital, Changhua, Taiwan

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ABSTRACT

This paper aims to present the case of a 43-year-old woman diagnosed with a rare condition of meningoencephalocele that arose from a meningioma, and treated with endoscope-assisted transnasal tumor extirpation and repair of the skull base defect with tensor fascia lata flap. Endoscope-assisted operation is a viable and minimally invasive alternative to traditional craniotomy. With improved endoscopic equipment and operative technique, we can perform more reliable surgery and provide better quality of life for these patients.

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1. Introduction

Intranasal encephalocele is a rare herniation of cranial contents from the cranial cavity into the nose [1,2]. It may include the meninges only, termed as meningocele, or it may contain brain tissue and meninges, termed as meningoencephalocele. Encephalocele is usually a congenital anomaly, and may sometimes occur following a trauma or as a result of chronic raised intracranial hypertension. The clinical presentation of an encephalocele may be rhinorrhea, meningitis, nasal obstruction or unilateral nasal congestion, but it may also be asymptomatic [3]. Occult intranasal meningocele identified during preoperative investigation for craniofacial corrective surgery has also been reported [4].

The objective of this paper is to present a case where a patient who had meningo-encephalocele accompanied with meningioma who was treated with a trans-nasal endoscope-assisted tumor excision and repair of the skull base defect with tensor fascia lata flap 5 months after primary craniotomy. Endoscopic repair is a viable and minimally invasive alternative to traditional craniotomy. With the improvement in endoscope-assisted operation techniques, we can perform more reliable surgery; decrease

discomforts such as nasal obstruction, cerebrospinal fluid (CSF) rhinorrhea and recurrent headache, and provide better quality of life to such patients.

2. Case report

A 43-year-old woman came to our hospital presenting with a two-year long left nasal obstruction. There was no history of anosmia, trauma or previous nasal surgery. Anterior rhinoscopy revealed a large cystic polypoid mass in the left nasal cavity. Posterior rhinoscopy revealed a smooth nasopharynx. On endoscopic examination, a firm protuberant mass over the middle meatus was noted. Computed tomography (CT) scans showed the fullness and density of soft tissues in the left ethmoid, the left frontal, the left sphenoid sinuses and nasal cavity. The bony structure of the left cribriform plate was not visualized that sinonasal tumor, which comes from skull base defect was favored (Fig. 1). Magnetic resonance imaging (MRI) showed a huge left frontal lobe meningioma (6.1 × 6.5 × 6.3 cm) associated with a mass effect compressing the frontal horn of the ventricle, resulting in a left meningoencephalocele that extended caudally into the ethmoid and nasal cavity, with defects in the left cribriform plate (Fig. 2). For differential diagnosis, endoscopic biopsy was arranged and the pathology report revealed an encephalocele with glial tissues and neurons in the subepithelial stroma over the nasal cavity. After a careful preoperative evaluation and discussion, a two-stage operation for complete tumor excision was arranged. Initially, she was admitted to the neurosurgery department for

* Corresponding author at: Department of Otorhinolaryngology, Head and Neck Surgery, Changhua Christian Hospital, #135 Nanshiau Street, Changhua 500, Taiwan. Tel.: +886 4 723 8595; fax: +886 4 711 5206.

E-mail address: 143859@cch.org.tw (M.-K. Chen).

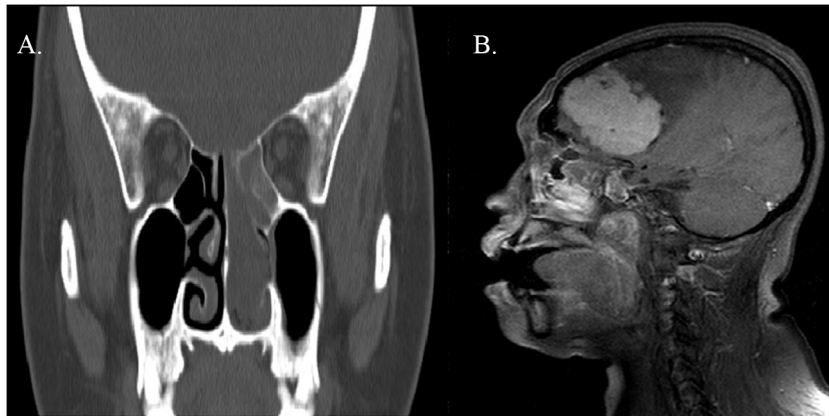


Fig. 1. Pre-operative CT images. (A) Image with coronal section shows intensely enhancing mass in left ethmoid sinus, extending to the cribriform plate. (B) Sagittal section shows brain tumor and sinonasal tumor, which arise from skull base defect.

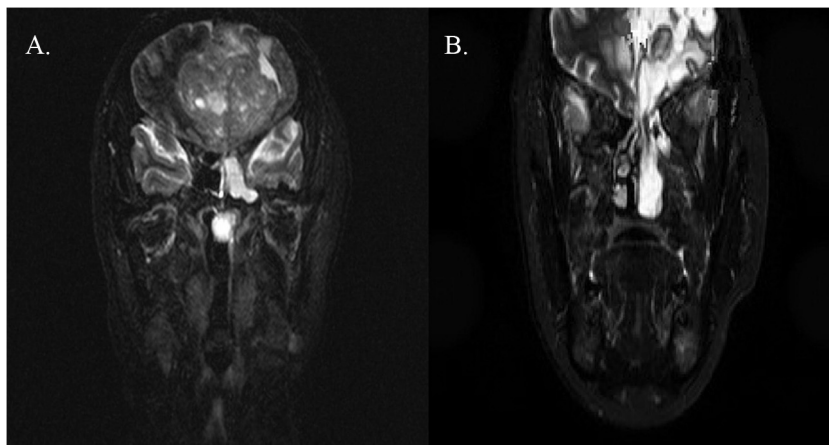


Fig. 2. (A) Pre-craniotomy MR imaging. There was a huge left lobe meningioma ($6.1 \times 6.5 \times 6.3$ cm) associated with mass effect compressed on the frontal horn of the ventricle, with the development of a left side meningoencephalocele with defect of the left cribriform plate, caudally extending into the ethmoid and nasal cavities. (B) Follow-up MRI at 5 months after craniotomy for meningioma. Lobulated and pedunculated fluid accumulation within the left nasal cavity, and perifocal edema with some encephalomalacia was noted.

craniotomy for brain tumor removal on April 19, 2007. During the operation, a 6-cm falx meningioma with intact capsule and hyper-vascularized appearance was found. The tumor did not invade the parenchymal brain tissue, so the arachnoid plane was left intact after complete extirpation of the tumor. Neither overt skull base bony defect exposure, nor brain tissue entrapment was explored. Five months later, a follow-up MRI revealed lobulated and pedunculated fluid accumulation within the left nasal cavity, confirming residual encephalocele (Fig. 2). We performed trans-nasal endoscope-assisted extirpation of the nasal encephalocele and repair of the skull base defect with tensor fascia lata flap as the second stage surgery.

3. Surgical repair

The surgery was performed under general anesthesia. The patient was in the supine position at 30° dorsal elevation. After placing highly concentrated adrenalin-soaked (1:1000) cottonoids in the nasal cavity for 15 min, the surgery was performed with a traditional 4-mm 0° nasal endoscope.

The lesion was located at the posterior part of the cribriform plate and filled the ethmoid sinus. After local infiltration of the middle turbinate with a solution of xylocaine and adrenaline (1:100,000), we carefully made a resection of the entire tumor

mass. The meningoencephalocele was identified and isolated with scissors (Fig. 3). An artificial Surgicel (Johnson & Johnson Medical) was placed on the wound to prevent intraoperative bleeding. The encephalocele was pulled out after complete excision of the tumor margin. Not much active bleeding or clear CSF fluid leakage was noted. We harvested the tensor fascia lata flap from the left thigh to protect the surgical wound. Later, we created a pediculate flap from the middle turbinate to cover the tensor fascia lata flap and help closing the skull base defect. Nasal packing with Gelfoam (Pfizer Inc.), Rhinocele (Invotec International Inc.), and Furacin gauze was designed and inserted into the nasal cavity to keep the nasal packing in place (Fig. 3). After the completion of skull base tumor excision and tensor fascia repair, there was no overt hemorrhage event or fistula formation. In the end, spinal drainage was not needed, as this was a minimal invasive surgery with less potential to increase intracranial pressure.

4. Post-operative

After the operation, the patient was kept sedated in the intensive care unit (ICU) for 2 days in order to keep the nasal packing in place. Antibiotics were prescribed since the operation day and lasted for 10 days. We removed the Rhinocele and Furacin gauzes two days later as no active epistaxis or flap dehiscence was

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