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### Title

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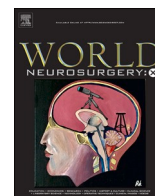
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## Surgical management of a lateral sphenoid sinus encephalocele: 2-Dimensional operative video

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### ABSTRACT

Encephaloceles are considered rare with an approximate incidence of 1 in 35,000, and sphenoid encephaloceles are even more uncommon.<sup>2</sup> Two types of sphenoid encephaloceles exist: medial perisellar encephaloceles, and lateral sphenoidal encephaloceles. Surgical correction of the lateral sphenoid recess encephalocele is achieved via one of two endoscopic approaches: extended sphenoidotomy or transpterygopalatine. Extended sphenoidotomy is preferred if the angle between the access door and lateral extension of bone defect is greater than 35°.<sup>1</sup> Otherwise, the transpterygopalatine approach is used. Intraoperative video demonstrating an extended sphenoidotomy approach to correcting a lateral recess sphenoidal encephalocele has not previously been published.

Here we present a case of a 41-year-old female who presented with meningitis, a cerebrospinal fluid leak, and an incidental sphenoid mass. Brain MRI redemonstrated the mass in the sphenoid sinus consistent with an encephalocele occupying Sternberg's Canal. The patient consented to the procedure. The video demonstrates the skull base approach, encephalocele extraction, collagen inlay, and nasal septal bone and vascularized pedicled nasoseptal flap placement. Postoperative imaging confirmed the placement of the collagen inlay and nasal septal bone autograft. The patient recovered from surgery and was discharged on post-operative day 3 with no cerebrospinal fluid (CSF) leak recurrence. Postoperative follow up demonstrated viable nasoseptal graft without evidence of CSF leak.

For patients with favorable anatomy, an extended sphenoidotomy approach to lateral sphenoid sinus encephalocele resection is a preferred alternative to the transpterygoid approach. This surgical video demonstrates the technique for managing lateral sphenoid sinus encephaloceles occupying Sternberg's canal, including endonasal approach, encephalocele resection and posterior sphenoid wall repair.

### Revised Video Link:

[https://www.dropbox.com/scl/fi/culhnwxq9vvp3voc28bk1/Encephalocele\\_Video\\_Revision\\_Shortened.mp4?rlkey=jdx34zhuoco4wubepm5y3bhjc&st=w50ylzx2&dl=0](https://www.dropbox.com/scl/fi/culhnwxq9vvp3voc28bk1/Encephalocele_Video_Revision_Shortened.mp4?rlkey=jdx34zhuoco4wubepm5y3bhjc&st=w50ylzx2&dl=0)

### CRediT authorship contribution statement

**Ryan W. Sindewald:** Writing – original draft. **Michael G. Brandel:** Writing – review & editing. **Arvin R. Wali:** Writing – review & editing. **Carol H. Yan:** Writing – review & editing. **David R. Santiago-Dieppa:** Writing – review & editing, Supervision, Conceptualization.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Further reading

- Herrera Vivas A, Ospina J, Wuesthoff C, Carrau R. Managing sphenoid lateral recess cerebrospinal fluid leaks. In: Stamm A, ed. *Transnasal Endoscopic Skull Base and Brain Surgery: Surgical Anatomy and its Applications*. Thieme; 2019:580–587.
- Lai SY, Kennedy DW, Bolger WE. Sphenoid encephaloceles: disease management and identification of lesions within the lateral recess of the sphenoid sinus. *Laryngoscope*. 2002;112(10):1800–1805. <https://doi.org/10.1097/00005537-200210000-00018>.

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**Abbreviations list**

CSF	Cerebrospinal Fluid
CT	Computed Tomography
ED	Emergency Department
HA	Headache