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Case Report

Pituitary abscess occurring 12 years after transsphenoidal surgery for Rathke's cleft cyst^{☆,☆☆}

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ABSTRACT

A 73-year-old man who previously underwent transsphenoidal surgery for a Rathke's cleft cyst presented with headache and fever. Ophthalmological examination revealed the progression of visual impairment. Cerebral magnetic resonance imaging revealed a cystic mass in the sellar and suprasellar regions with rim-like enhancement. An intrasellar hyperintense area with temporal enlargement was identified using serial diffusion-weighted imaging. Lumbar cerebrospinal fluid tap findings indicated bacterial meningitis. The patient had undergone a transsphenoidal surgery; an intraoperatively implanted sheet of artificial dura mater from the previous surgery was identified adjacent to the sellar floor. After incising the floor, the pus material was drained and methicillin-sensitive *Staphylococcus aureus* was identified on culture. Consecutive antibiotic treatment resolved the pituitary abscess (PA). PA may develop as a late complication of transsphenoidal surgery, particularly when an artificial material is implanted during surgery. Clinical signs coupled with temporal findings on diffusion-weighted sequences can facilitate the diagnosis and activity of PA and serve as a guide for proper management.

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Introduction

A pituitary abscess (PA) is a rare entity that can primarily develop in association with nonfunctioning pituitary adeno-

mas, Rathke's cleft cysts, and somatotrophic adenomas or complicated by transsphenoidal surgery. Common symptoms of PA include visual disturbances, headache, fever, meningitis, and hypopituitarism resulting from compression of the optic pathways and intracranial spread of the infection. Delays

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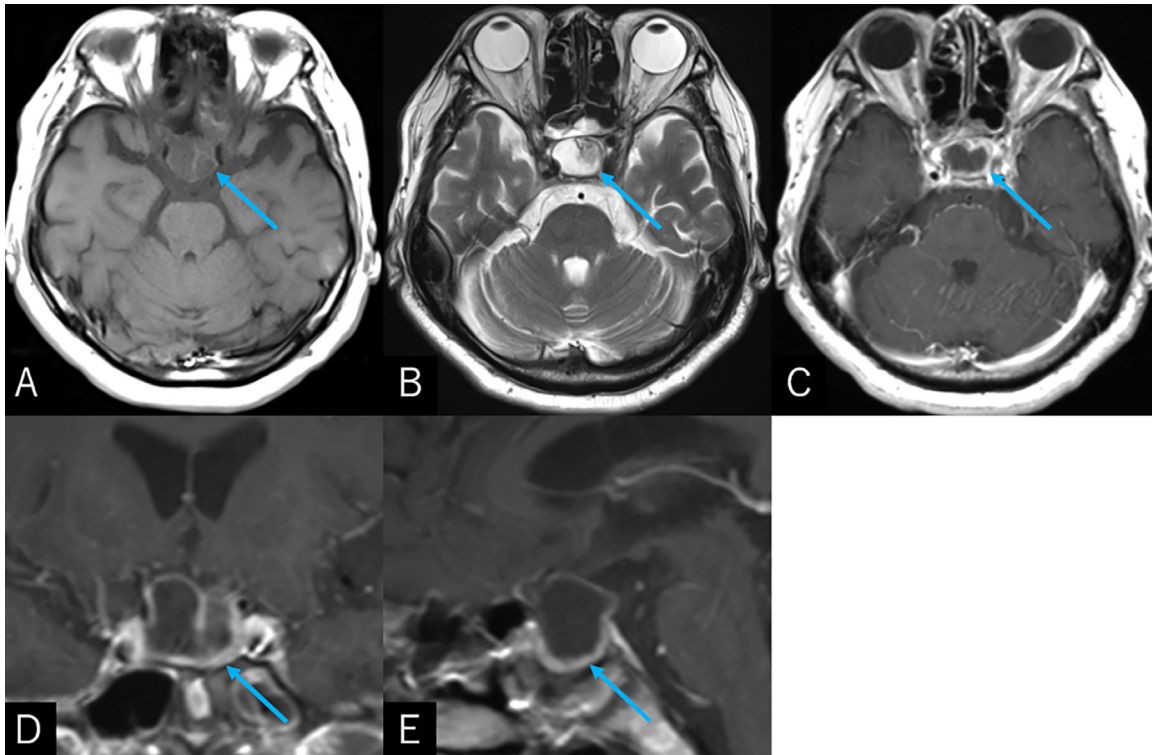


Fig. 1 – Axial T1- (A), T2- (B), and postcontrast T1-weighted (C) magnetic resonance images showing a cystic mass around the sellar and suprasellar regions. It demonstrates mostly hypointensity on T1- and hyperintensity on T2-weighted images, with rim-like enhancement (A–C, arrow). The postcontrast coronal (D) and sagittal (E) images show the heterogeneous thickness of the enhanced rim (arrow).

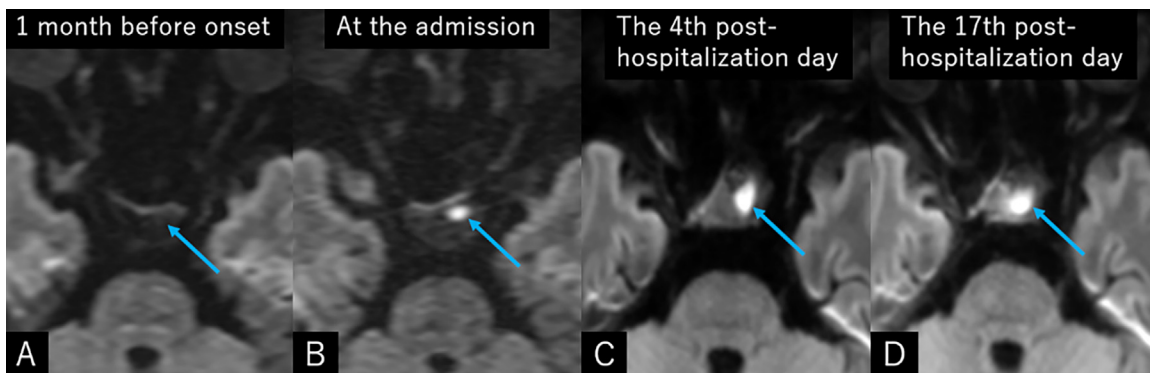


Fig. 2 – Serial preoperative images of axial diffusion-weighted sequence performed 1 month before the onset of symptoms (A), at the admission (B), and at the fourth (C) and 17th posthospitalization days (D) showing the development of the intrasellar hyperintense area in the sella and its temporal enlargement (arrow).

in timely trans-sphenoidal PA drainage followed by adequate antibiotic administration can result in poor outcomes, and variable causative organisms have been documented [1–5]. On magnetic resonance imaging (MRI), PAs typically appear hypointense or isointense on T1- and isointense or hyperintense on T2-weighted sequences, with a rim-like enhancement following gadolinium administration [6,7]. Diffusion-weighted imaging has been reported to be useful in diagnosing PA [8,9]. PA development after transsphenoidal surgery is a rare but distinct condition that can be life-threatening [2,10]. In this

report, we describe a patient who underwent transsphenoidal surgery for a Rathke's cleft cyst, followed by PA 12 years later.

Case report

A 73-year-old man presented with a 2-week history of worsening headaches and fever. The patient had undergone a transsphenoidal surgery for a Rathke's cleft cyst 12 years prior and presented with bitemporal hemianopsia. Total resection was achieved, followed by an uneventful postoper-

ative course without tumor recurrence. During the outpatient course, cerebrospinal fluid rhinorrhea and fever of unknown origin were not observed. An annual surveillance MRI showed no new abnormalities 1 month before the onset of symptoms. At the presentation, the patient was well-oriented but presented meningeal signs with a body temperature of 39.3°C. Ophthalmological examination revealed an enlargement of visual defects due to a deficit in the previous Rathke's cleft cyst. Blood examination revealed leukocytosis (10,000/ μ L) and an elevated serum C-reactive protein level (2.2 mg/dL). Cerebral MRI revealed a cystic mass around the sellar and suprasellar regions with a rim-like enhancement (Fig. 1). Lumbar cerebrospinal fluid tap revealed an increased white blood cell count (315 / μ L), an elevated level of protein (234 mg/dL), and a decreased level of glucose (36 mg/dL), suggesting bacterial meningitis. Despite empirical antibiotic therapy with intravenous cefotaxime, the patient's meningeal signs and high-grade fever did not improve. Moreover, serial diffusion-weighted imaging performed on the fourth and 17th posthospitalization days showed temporal enlargement of the intrasellar hyperintensity (Fig. 2). Based on a presumptive diagnosis of PA, the patient underwent transsphenoidal surgery on the 17th posthospitalization day. Intraoperatively, a sheet of artificial dura mater (Gore-Tex®) implanted during the previous transsphenoidal surgery was identified lying adjacent to the sella floor (Fig. 3A). Upon incising the dura mater of the sella floor, pus material was drained and methicillin-sensitive *Staphylococcus aureus* was identified on culture (Fig. 3B). The sellae were sufficiently irrigated using a saline solution. The sellar floor was reconstructed using autologous adipose tissue harvested from the abdominal wall. The patient's postoperative course was uneventful without recurrence of infection. A week of antibiotic treatment with meropenem and vancomycin resulted in significant improvement in the patient's symptoms. MRI performed on postoperative day 7 showed resolution of the cystic mass and involvement of a hyperintense area (Fig. 4). The patient has been followed up for >3 years without PA recurrence on annual surveillance MRI.

Discussion

PA can be life-threatening unless managed appropriately [2]. In the present case, initial empirical antibiotic treatment failed to resolve the PA, followed by transsphenoidal drainage, which resulted in the identification of methicillin-sensitive *S aureus* as the causative organism and the selection of an appropriate antibiotic. *Staphylococcus aureus* is a resident bacterium frequently associated with infectious diseases of the nose and paranasal sinuses [11]. It also has been documented as the causative organism of PA [1,3–5,10]. Furthermore, in our case, an artificial dura mater was implanted during the previous transsphenoidal surgery to prevent cerebrospinal fluid leakage. The use of artificial materials during transsphenoidal surgery could be a risk factor for the late development of PA. A high level of suspicion for PA is important when evaluating patients with previous transsphenoidal surgeries who develop fever and meningeal signs. Timely transsphenoidal drainage

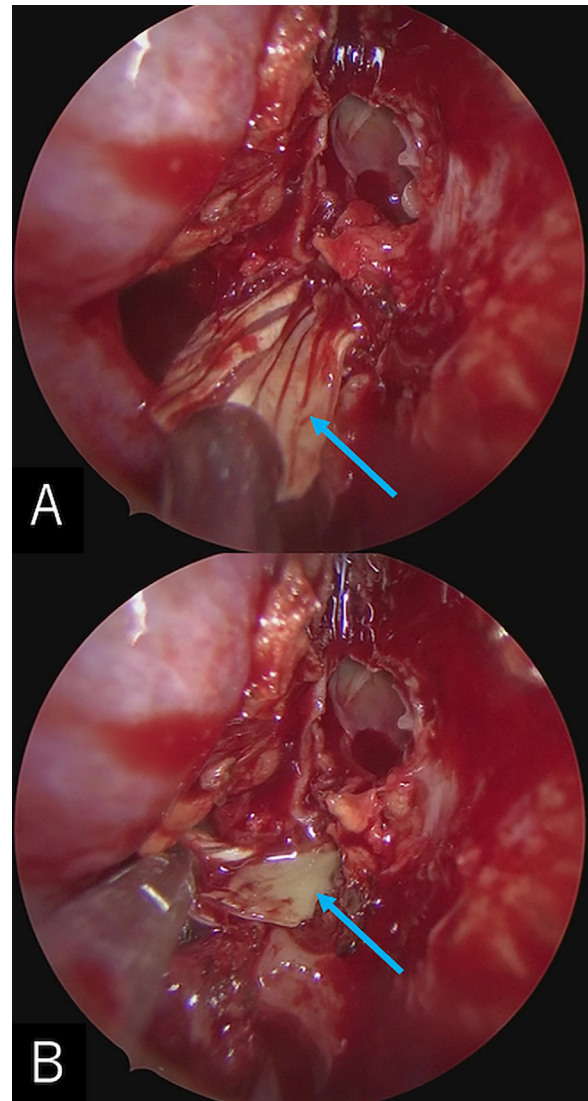


Fig. 3 – Intraoperative photos showing a sheet of artificial dura mater, implanted during the previous transsphenoidal surgery, lying adjacent to the sella floor (A, arrow) and pus material drained upon incising the dura mater of the sella floor (B, arrow).

and identification of the causative organism are crucial for managing PAs.

In our case, serial diffusion-weighted imaging was useful in detecting the development of PA and its progression as an intrasellar hyperintense area in response to the severity of the patient's symptoms. This sequence is useful for diagnosing various pathologies, including ischemic stroke, tumors, and inflammatory and infectious diseases. In our case, the rapid enlargement of the hyperintense area in the sella, coupled with the patient's clinical signs, evoked PA. Previous reports have suggested the usefulness of diffusion-weighted imaging in diagnosing PA [8,9]. In the present case, the sequence reflected the treatment outcomes. It may be an indicator of PA disease activity, appropriate timing of surgical intervention, and treatment effects.

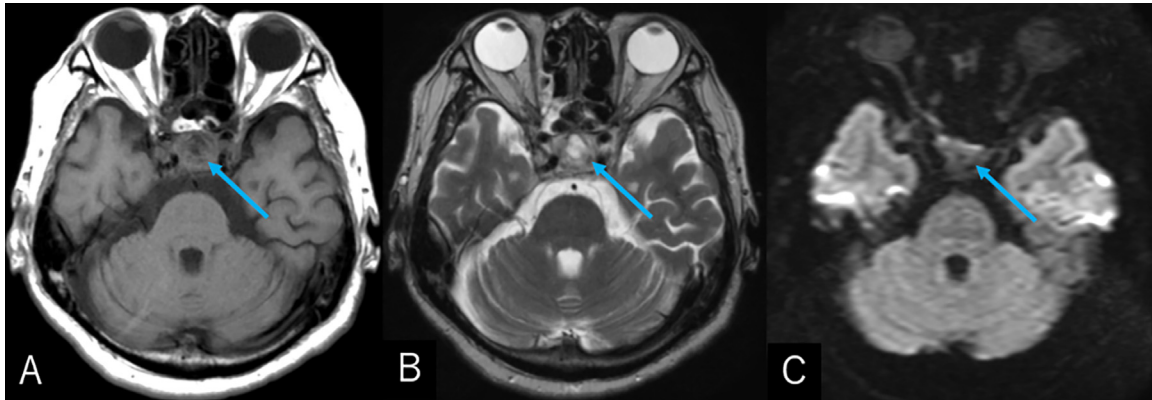


Fig. 4 – Axial T1- (A), T2- (B), and diffusion-weighted (C) magnetic resonance imaging performed on the postoperative day 7 showing resolution of the cystic mass in the sellar and suprasellar regions (A and B, arrow) and hyperintense area in the sella (C, arrow).

Conclusion

PA may develop as a late complication of transsphenoidal surgery, particularly when an artificial material is implanted intraoperatively. Clinical signs, coupled with temporal findings on diffusion-weighted sequences, can facilitate the diagnosis and activity of PA and serve as a guide for proper management.

Author contributions

All the authors contributed equally to the study.

Ethical standards

We declare that all procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and the 1964 Declaration of Helsinki and its later amendments.

Patient consent

Written informed consent was obtained from the patient for publication of anonymized data. The patients documented in the manuscript fully understood and agreed that the authors use the information materials of the patients in anonymized manner for possible publication in radiology case reports.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.radcr.2024.07.155](https://doi.org/10.1016/j.radcr.2024.07.155).

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