

Intrasellar arachnoid cyst

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An intrasellar [arachnoid cyst](#) is a rare type of [cyst](#) located within the [sella turcica](#), a bony depression at the [skull base](#) that houses the [pituitary gland](#).

Key Features:

Incidence and Prevalence

Intrasellar arachnoid cysts are considered rare, accounting for a small percentage of sellar lesions. They are often incidental findings on imaging studies.

Etiology

The exact cause of intrasellar arachnoid cysts is not well-established. They are thought to result from an arachnoid-lined collection of CSF within the sella turcica, possibly arising from a developmental anomaly.

Clinical Presentation

Many cases of intrasellar arachnoid cysts are asymptomatic and discovered incidentally during imaging for unrelated issues. When symptomatic, patients may present headache, [optic nerve compression](#), endocrine dysfunction, or [hydrocephalus](#).

The specific symptoms depend on the size and location of the cyst within the sella turcica.

Imaging Characteristics

Magnetic Resonance Imaging (MRI) is the primary imaging modality for diagnosing intrasellar arachnoid cysts. These cysts typically appear as well-demarcated, CSF-filled lesions within the sella turcica.

Treatment Options

The management of intrasellar arachnoid cysts depends on their size, symptoms, and impact on surrounding structures. Asymptomatic cysts may not require intervention and can be managed with regular monitoring. Symptomatic cases may warrant surgical intervention. Transsphenoidal surgery, which involves accessing the sella turcica through the nasal passages, is a common approach for the treatment of these cysts.

Surgical Considerations:

The surgical procedure typically involves fenestration or opening of the cyst wall, allowing for drainage of the cyst fluid. In some cases, a [shunt](#) may be placed to allow continuous drainage.

Outcomes and Prognosis

Surgical outcomes for intrasellar arachnoid cysts are generally favorable, with resolution of symptoms in many cases. However, as with any surgery, there are potential risks and complications, including infection, bleeding, or recurrence of the cyst.

Long-Term Follow-Up:

Long-term follow-up is essential to monitor for potential cyst recurrence and assess the maintenance of symptom relief. Periodic imaging studies and clinical evaluations are typically conducted during the follow-up period. In conclusion, intrasellar arachnoid cysts are uncommon lesions that can present with a range of symptoms. While many are asymptomatic and may not require intervention, symptomatic cases can be effectively managed through surgical approaches, with favorable outcomes reported in the literature. Close collaboration between neurosurgeons, endocrinologists, and radiologists is crucial for the comprehensive management of patients with intrasellar arachnoid cysts.

Case series

2022

From 2002 to 2019, d'Artigues et al. retrospectively reported the data of 17 cases of Intrasellar arachnoid cysts operated in Timone University Hospital, Marseille, France. Preoperative clinical findings were collected including main symptoms, visual function and endocrinological assessment. Surgical procedure was homogeneous and consisted in endonasal fully endoscopic surgical obliteration of the cyst cavity with fat graft. Post-operative outcomes, complication and follow-up was

reported.

Visual disorders and/or headaches were the main symptoms. Our technique provided improvement for 83.3% of the patients suffering from visual disturbance and for 87.5% of those suffering from headaches. We reported 2 cases of cerebrospinal fluid (CSF) leakage (11.8%), but no meningitis. One case of definitive diabetes insipidus occurred and one case of postoperative syndrome of inappropriate antidiuretic hormone secretion was temporary. There was one case of recurrence reported. The mean follow-up was 39 months.

Patients with symptomatic Intrasellar arachnoid cyst can be treated successfully by endoscopic endonasal obliteration of the cyst. This simple technique offers true benefits for the patients without craniotomy, but the complication rate remains high especially with the risk of CSF leakage. Special attention to skull base opening and closing could reduce this risk ¹⁾.

The study spans a considerable timeframe (2002 to 2019), providing a longitudinal perspective on the endoscopic endonasal obliteration of symptomatic Intrasellar arachnoid cysts. This duration contributes to understanding the durability of outcomes over an extended period. Homogeneous Surgical Technique:

The study highlights a homogeneous surgical approach, utilizing endonasal fully endoscopic surgical obliteration of the cyst cavity with a fat graft. This consistency in the surgical procedure enhances the reliability of the findings. Comprehensive Preoperative Data:

Preoperative clinical findings, including main symptoms, visual function, and endocrinological assessments, are comprehensively collected. This detailed preoperative dataset enriches the understanding of the patient characteristics and helps contextualize the outcomes. Patient-Centric Outcome Assessment:

The study assesses postoperative outcomes based on symptomatic improvement, emphasizing patient-centric perspectives. High percentages of improvement for visual disturbances (83.3%) and headaches (87.5%) provide valuable insights into the clinical efficacy of the technique. Detailed Reporting of Complications:

Complications, including cerebrospinal fluid (CSF) leakage (11.8%), diabetes insipidus, and syndrome of inappropriate antidiuretic hormone secretion, are reported in detail. The transparency in reporting complications contributes to a balanced evaluation of the procedure's safety profile. Follow-Up Duration:

A mean follow-up of 39 months is provided, offering a substantial timeframe for assessing the long-term outcomes and potential recurrence of symptomatic arachnoid cysts following endoscopic endonasal obliteration. Areas for Consideration:

Limited Comparative Analysis:

The study lacks a comparative analysis with alternative surgical approaches or conservative management. A comparative discussion could offer insights into the relative advantages and disadvantages of endoscopic endonasal obliteration compared to other interventions. Small Sample Size:

The study is based on a relatively small sample size of 17 cases. While this limitation is acknowledged, the generalizability of findings to a broader patient population may be constrained.

Incomplete Reporting on Visual and Endocrine Function:

Although the study mentions improvement percentages for visual disturbances and headaches, more specific details on improvements in visual function and the criteria for assessing endocrine function would enhance the clinical applicability of the findings. Risk Mitigation Strategies:

The study mentions a high complication rate, particularly CSF leakage. Further discussion on strategies implemented to mitigate this risk, such as meticulous closure techniques, would offer practical insights for neurosurgeons adopting a similar approach. Conclusion:

In conclusion, the study presents a valuable exploration of endoscopic endonasal obliteration for symptomatic arachnoid cysts. The homogeneous surgical technique, detailed preoperative data, and patient-centric outcome assessment contribute to the understanding of this approach's efficacy. However, the study would benefit from addressing the limitations mentioned above and incorporating a comparative perspective to strengthen its clinical relevance and applicability.

The clinical data of 11 patients with intrasellar arachnoid cyst treated by transnasal sphenoidal approach with simple muscle packing at the Neurosurgery Department of the First Affiliated Hospital of Zhengzhou University from January 2014 to February 2020 were retrospectively analyzed. There were 5 males and 6 females, with a median age of 48 years (range: 23 to 75 years). The clinical manifestations included headache in 6 cases, dizziness in 4 cases, hypo-libido in 1 case, disturbance of consciousness in 1 case, visual impairment in 7 cases and mixed pituitary dysfunction in 5 cases. The enlargement of the sellar fossa was seen in the preoperative MRI images. The enhanced MRI images showed that the cyst wall of the intrasellar arachnoid cyst was not enhanced, and the compression and thinning of the sellar base was seen in the CT images. In 9 cases, the cyst extended suprasellar and the sellar septum was "arched". In 7 cases, the cyst compressed the optic chiasm upward. The cyst walls of all patients were incised through the nasal sphenoid approach under the endoscope, and the muscle was packed after sufficient drainage. The postoperative symptoms, pituitary endocrine function and recurrence of patients were followed up. Results: MRI images of the sellar region in all patients showed significant reduction or disappearance of cysts. Intracranial infection occurred in 1 case and electrolyte disorder in 2 cases, which were relieved after symptomatic treatment. No cerebrospinal fluid rhinorrhea occurred. Postoperative clinical symptoms were completely relieved in 6 cases and partially relieved in 5 cases. Pituitary endocrine function recovered completely in 2 cases and improved significantly in 4 cases. All patients were followed up for 10 to 40 months. One patient found to have a partial recurrence of the cyst 3 months after surgery. Because there were no new symptoms appeared, the follow-up was continued without second operation. Conclusion: Transnasal sphenoidal approach is a feasible method for the treatment of intrasellar arachnoid cyst ²⁾

The study includes a decent-sized cohort of 11 patients with intrasellar arachnoid cysts, providing a focused analysis of a specific patient population. The demographic information, including age, gender distribution, and clinical manifestations, is clearly presented, contributing to a comprehensive understanding of the patient profile. Detailed Preoperative Imaging Analysis:

The inclusion of preoperative MRI and CT images with a thorough description of the cyst characteristics, such as enlargement of the sellar fossa, lack of cyst wall enhancement, and compression of adjacent structures, enhances the radiological context for readers. Consistent Surgical Approach:

The study demonstrates consistency in the surgical approach, employing the transnasal sphenoidal approach with endoscopic assistance for all patients. This standardization aids in assessing the uniformity of the surgical technique. Postoperative Imaging and Follow-Up:

The postoperative MRI images showing a significant reduction or disappearance of cysts provide tangible evidence of the effectiveness of the surgical intervention. A follow-up period ranging from 10 to 40 months adds valuable longitudinal data to assess the durability of the treatment outcomes.

Clinical Symptom Relief and Endocrine Function Improvement:

The study reports positive clinical outcomes with complete relief of symptoms in the majority of cases and significant improvements in pituitary endocrine function. Long-term follow-up data indicate sustained symptom relief and functional improvement, further supporting the efficacy of the transnasal sphenoidal approach. Areas for Consideration:

Limited Comparative Analysis:

The study lacks a comparative analysis with alternative surgical approaches or conservative management. A comparative discussion could provide insights into the superiority or equivalency of the transnasal sphenoidal approach. Incomplete Reporting of Complications:

While intracranial infection and electrolyte disorder are mentioned, the study lacks comprehensive reporting on potential complications associated with the transnasal sphenoidal approach, such as olfactory disturbances, nasal septum perforation, or sinonasal discomfort. Recurrence Management:

The study briefly mentions a partial recurrence in one patient but does not delve into the management strategy for recurrent cases. A more detailed discussion on the management of recurrent cysts would enhance the practical implications of the findings. Objective Measures of Pituitary Function:

While improvements in pituitary endocrine function are mentioned, the study could benefit from presenting specific hormonal markers or objective measures used to assess pituitary function. Conclusion:

In conclusion, the study provides valuable insights into the transnasal sphenoidal approach for treating intrasellar arachnoid cysts. The consistent surgical technique, detailed preoperative imaging analysis, and positive clinical outcomes contribute to the feasibility of this approach. However, addressing the limitations mentioned above and incorporating a comparative perspective would strengthen the study's impact and relevance in the field of neurosurgery.

Case reports

2023

A 51-year-old woman with a known purely intrasellar arachnoid cyst diagnosed 23 years prior to presentation, evolved with gradual campimetric evaluation. Magnetic resonance imaging showed significant growth of the lesion, now extending into the left middle fossa through the cavernous sinus. The patient underwent cyst fenestration via the transsphenoidal approach. This is the first case in the literature of a patient with an intrasellar arachnoid cyst extending into the middle cranial fossa ³⁾.

2019

A case of intrasellar arachnoid cyst with suprasellar extension whose treatment was based on endoscopic transsphenoidal fenestration. The epidemiological, clinical, pathophysiological, radiological, therapeutic and evolutionary features have been analyzed. Neuroendoscopic procedures are performed with increasing frequency in surgery. Prognosis is good and recurrences are frequent, even after several years of evolution ⁴⁾

2016

A 49-year old patient who had headaches for 6 months and cystic sellar mass was found in his cranial imaging. We operated him by transnasal transsphenoidal route. Our intraoperative diagnosis was an arachnoid cyst and pathologic studies verified our observation. He did well postoperatively and after a 1year follow-up he was left free from future follow-ups.

As common cystic lesions occupying the sellar region can simulate ACs both clinically and radiologically, neurosurgeon can fail to include ACs in making the initial diagnosis preoperatively.

Although a rare entity, arachnoid cysts should be considered in the differential diagnosis of sellar region ⁵⁾.

2005

A 67-year-old man first noticed loss of pubic and axillary hair in 1992 and then a visual field defect in 2001. He experienced loss of consciousness attributed to hyponatremia in April 2002. Magnetic resonance imaging showed a giant intrasellar cystic mass, 40 mm in diameter, that had compressed the optic chiasm. The patient complained of chronic headache, and neurological examination revealed bitemporal hemianopsia. Preoperative endocrinological examination indicated adrenal insufficiency, and hypothyroidism due to hypothalamic dysfunction. The patient underwent endonasal transsphenoidal surgery. The cyst membrane was opened and serous fluid was drained. Histological examination identified the excised cyst membrane as arachnoid membrane. The patient's headaches resolved postoperatively, but the bitemporal hemianopsia and endocrinological function were unchanged. This arachnoid cyst associated with hypothalamic dysfunction might have been caused by an inflammatory episode in the suprasellar region ⁶⁾.

1991

A 53-year-old man was admitted because of decreased visual acuity. Magnetic resonance imaging showed a large intrasellar cyst extending into the suprasellar cistern, with compression of optic nerves. The intensity of the cyst was identical to that of the surrounding subarachnoid space on both T1-, T2-, and proton density-weighted images. Transsphenoidal surgery was performed, but subsequent refilling of the cyst required additional transcranial surgery. Analysis of the cerebrospinal fluid-like cystic fluid revealed high levels of protein and pituitary hormones. Histological study revealed that the cyst wall was composed of connective tissue and arachnoid cells, which were ultrastructurally characterized by a number of desmosomes ⁷⁾.

1)

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