talenta PUBLISHER

AANHS Journal

Journal homepage: http://aanhsj.usu.ac.id

AANHS Asian Australasian Neuro & Health Science Journal
Universitas Sumatera Utara - Indonesia

Transsphenoidal Approach for Sellar Region Tumor: A Case Series

Sabri Ibrahim*[1], Annisa Aulia Savitri[2], Diqqi Davi[2]

[1] *Department of Neurosurgery Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia*

[2] *General Practitioner, Universitas Sumatera Utara, Medan, Indonesia*

*Corresponding author: sabriibrahim@usu.ac.id

ARTICLE INFO

Article history:
Received : Jul, 25th 2024
Revised : Aug, 23rd 2024
Accepted : Aug, 24th 2024
Available : Sept, 04th 2024

E-ISSN: 2686-0848

How to cite:
Ibrahim S, Savitri, A. A, Davi D. Transsphenoidal Approach for Sellar Region Tumor: A Case Series. Asian Australasian Neuro and Health Science Journal. 2024 Sept 06(02); 42-47

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International.

DOI: 10.32734/aanhsj.v6i2.17722

ABSTRACT

Introduction: Transsphenoidal approaches to the sellar region, with endoscopic or microscopic techniques, are regularly used to treat a diverse collection of pathologies.

Case Description: Three patients with presenting symptoms visual disturbance and headache were evaluated with MRI that showes sellar region masses. All patients were undergo transphenoid tumor removal. Post operation evaluation show improvement in visual disturbance and headache with no adverse event after procedure.

Discussion : Transsphenoidal endoscopic surgery (TSS) for functional pituitary adenomas yields better endocrinologic results for noninvasive macroadenomas. However, the rate of postoperative CSF leakage was greater with the endoscopic method. In patients with pituitary adenomas, younger age, dense visual field defect, and the preoperative absence of central or bilateral visual field abnormalities were predictive factors of visual field recovery following transsphenoidal approach-tumor excision. Overall survival rates are generally high, ranging from 91% to 98%.

Conclusion: Transphenoid approach was a good surgical method for sellar region masses and show good outcomes after operation.

Keyword : Sellar region masses; Surgical; Transsphenoid approach

1. Introduction

The sellar region represents a complex anatomical area that includes the bony framework of the central skull base, the pituitary gland, and a series of vascular, nervous, cerebrospinal fluid (CSF), and meningeal structures surrounding it. Therefore, a neoplastic or tumor-like mass in this region can originate from any of these elements, and this explains the wide variety of differential diagnoses that can be postulated. Current reference for classification of sellar region tumors was the 2021 WHO Classification of Tumors of the Central Nervous System–fifth edition [1, 2].

Common presenting symptoms in patients with sellar disease include headache, visual disturbances, and hypopituitarism, which can progress to permanent disease or can resolve with appropriate treatment [3]. In the modern era, transsphenoidal approaches to the sellar region, with endoscopic or microscopic techniques, are regularly used to treat a diverse collection of pathologies; both possess advantages and limitations when applied in specific cases [4].

2. Case Series

Case 1

Girl, 14 years old, with a chief complaint of headache since 7 days ago which felt increasingly aggravated. This patient also had a history of seizure 5 days before admission as 1x with a duration of 1 minute. Complaints of projectile vomiting were also found since 3 days before admission. On physical examination, there was a VAS pain scale of 4, GCS E4M6V5 with blood pressure 110/70 mmHg, respiratory frequency 24x per minute. Nuchal rigidity was not found. Lateralization was not found. Cranial nerve examination was within normal limits. On complete blood examination, renal function, electrolytes, and hemostasis function were within normal limits. Blood gas analysis showed respiratory alkalosis. CT scan showed a mixed-density lesion in the sellar region with intracranial SOL impression and ventriculomegaly (ER 38%, TH 15 mm). MRI brain examination (figure 1) with contrast showed a hypointense lesion at T1W1, hyperintense at T2WI, with a relatively well-demarcated post-contrast rim enchance, lobulated edges in the midbrain pressing on ventricle III and aquaductus sylvii measuring +/- 2.3 x 1.5 x 3.5cm, and dilation of the right and left lateral ventricles. Based on supporting examination, the patient was diagnosed with SOL intracranial o/t sellar region Rathke pounch cyst dd Craniopharyngioma. Then the patient underwent transphenoidal tumor removal (figure 2). The patient's postoperative condition showed improvement in head pain to VAS 2. Postoperative wound infection was not found.

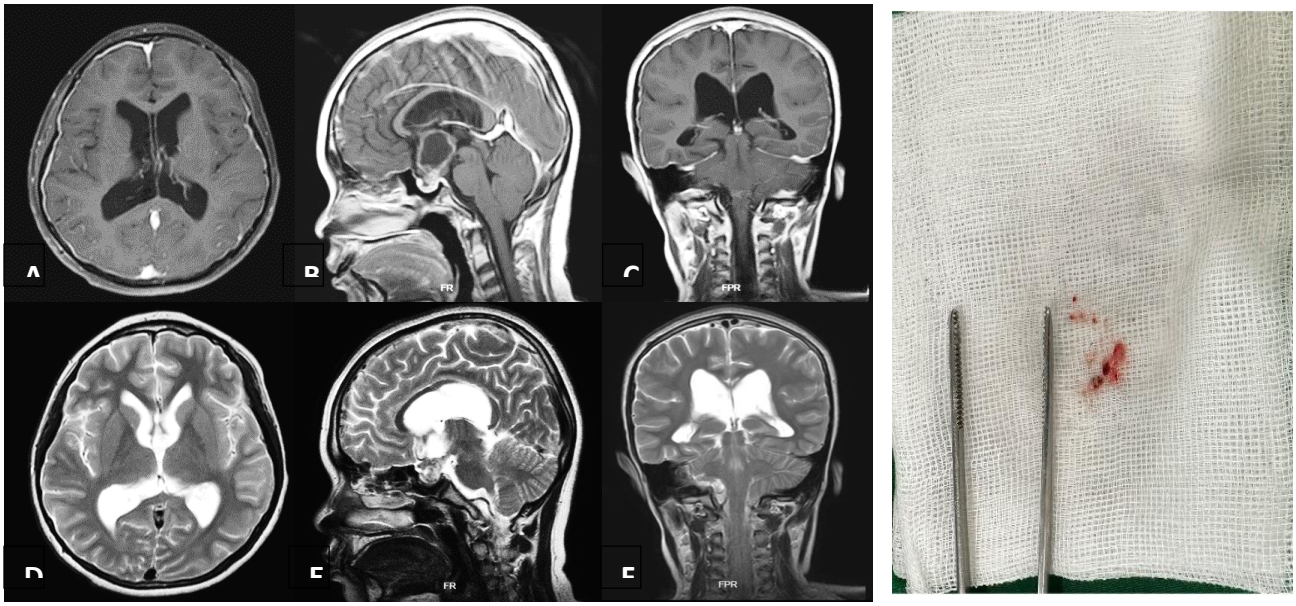

Figure 1. MRI brain of Case no. 1. (A) T1 axial with contrast, (B) T1 sagittal with contrast, (C) T1 Coronal with contrast, (D) T2 axial, (E) T2 Sagittal, (F) T2 Coronal, (G) Mass of Tumor Removal from case no. 1

Case 2

Female, 44 years old, with chief of complaint headache that had been felt since 2 months before admission to the hospital which had worsened in the last 1 month. Complaints of worsening vision with VOD 6/60 and VOS 3/60 were also found since the last 1 year. There were no complaints of double vision, seizures, vomiting, and loss of consciousness. Physical examination revealed a pain scale of VAS 2, GCS E4M6V5 with blood pressure 122/78 mmHg, respiratory frequency 18x per minute. Cranial nerve examination showed bitemporal hemianopsia. Nuchal rigidity was not found. Lateralization was not found. On complete blood test, renal function, electrolytes, hemostasis

function, and blood gas analysis were within normal limits. On MRI examination of the brain with contrast (Figure 3), an extraaxial mass is seen isointense T1, hyperintense T2 after contrast administration giving a homogeneous strong blockage in the sellar area with a dural tail size +/- 2.7 x 2.9 x 2.6 cm pressing on the sinus cavernosus. Based on the results of the examination, the patient was diagnosed with Sellar region tumor dd. Pituitary macroadenoma dd. Tuberculum sella meningioma. The patient underwent transphenoidal tumor removal surgery to remove the mass (Figure 4). The patient's postoperative general condition was good. Complaints of headache disappeared and the patient's vision improved with VOD 2/6 and VOS 6/60. There was no infection in the surgical wound.

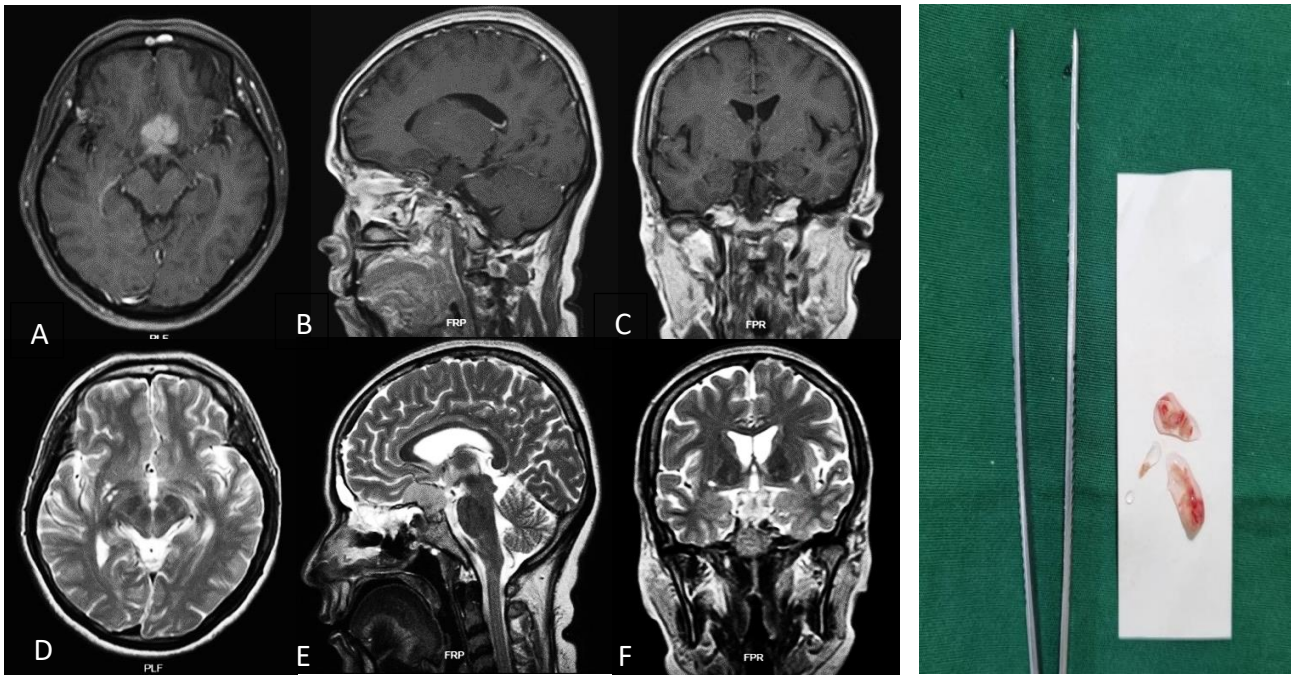

Figure 2. MRI brain of Case no. 2. (A) T1 axial with contrast, (B) T1 sagittal with contrast, (C) T1 Coronal with contrast, (D) T2 axial, (E) T2 Sagittal, (F) T2 Coronal, (G) Mass of Tumor Removal from case no. 2

Case 3

A 20-year-old man presented with a chief complaint of blurred vision that had been present for the past 2 years. The patient was currently wearing spectacles with spherical lenses due to complaints of blurred vision. Double vision was denied. The complaint of strabismus was found since the last 1 year. Headache has been present since the last 1 year and has been aggravated in the last 1 month. Seizures and projectile vomiting were not present. On physical examination, there was a VAS pain scale of 2, GCS E4M6V5 with blood pressure 125/73 mmHg, breathing frequency 21x per minute. Cranial nerve examination revealed bitemporal hemianopsia with VOD 2/60 and VOS 3/60. Strabismus was found in OD. Nuchal rigidity was not found. Lateralization was not found. On complete blood test, renal function, electrolytes, hemostasis function, and blood gas analysis were within normal limits. On MRI examination of the brain with contrast (Figure 5), there was a heterogeneous mass dominantly hypointense T1, hyperintense T2 after contrast administration, there was a picture of peripheral enhancement and blockage of part of the mass in the sellar area which extended to the suprasellar and parasellar left side with a calcified component measuring +/- 7, 8 x 8.9 x 6.8 cm that presses and pushes the basal ganglia, left lateral ventricle, left right frontal lobe, left-sided msesncephalon and chiasma optum causing a centerline shift to the right side by +/- 1 cm. Based on the examination, the patient was diagnosed with Sellar Region Tumor dd Chaniophyryngioma dd Rathke's Pouch Cleft dd Panhipopituitary Pituitary Macroadenoma. The patient underwent transsphenoidal tumor removal surgery to remove the mass (Figure 6).

Postoperative condition showed improvement in vision with VOD 6/60 and VOS 2/6. The patient's postoperative headache complaints were reduced with a VAS pain scale of 1. The patient's general condition was good with no infection found in the surgical scar.

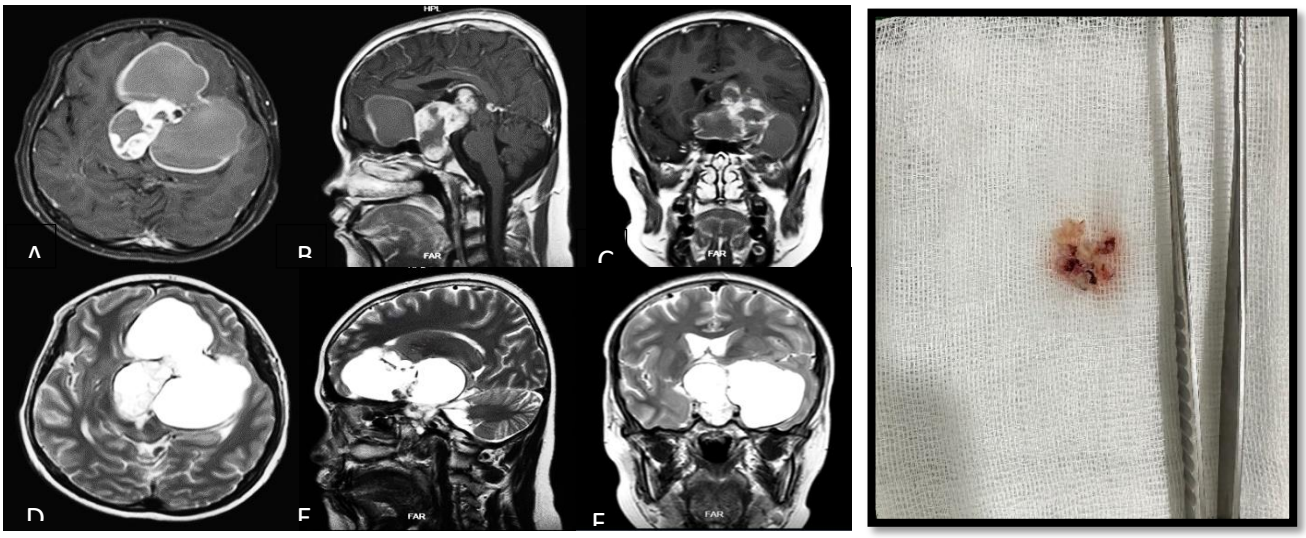

Figure 3. MRI brain of Case no. 3. (A) T1 axial with contrast, (B) T1 sagittal with contrast, (C) T1 Coronal with contrast, (D) T2 axial, (E) T2 Sagittal, (F) T2 Coronal, (G) Mass of Tumor Removal from case no. 3

The majority of sellar region tumor such as pituitary tumors are still treated using the transsphenoidal surgical method, which allows for pathologic evaluation and full or partial tumor excision (with the exception of prolactinomas, which should first receive medical treatment). The current standard technique for most non-functioning pituitary adenomas is endoscopy or microscopy-assisted transsphenoidal surgery. In some patients with a large pituitary tumor with invasion of nearby structures laterally, transcranial methods are still necessary. However, due to their complex anatomical position and diverse histology, pituitary tumors are difficult to surgically treat. Compared to the conventional transsphenoidal microsurgical method, transsphenoidal endoscopic surgery (TSS) for functional pituitary adenomas yields better endocrinologic results for noninvasive macroadenomas. However, the rate of postoperative CSF leakage was greater with the endoscopic method. In patients with pituitary adenomas, younger age, dense visual field defect, and the preoperative absence of central or bilateral visual field abnormalities were predictive factors of visual field recovery following transsphenoidal approach-tumor excision [5, 6].

To maintain the functions of the hypothalamus, pituitary gland, and optic nerve, total resection is the preferred treatment for patients with tumors in favorable locations. When the tumor is poorly positioned—resulting in the hypothalamus being displaced, compressed, or invaded at or above the mammillary bodies—a limited resection followed by localized radiation is recommended. Overall survival rates are generally high, ranging from 91% to 98% [7].

Endoscopic endonasal surgery is not solely limited to sellar or small cystic suprasellar tumors anymore. This technique can effectively target prechiasmatic/preinfundibular and subchiasmatic/transinfundibular lesions. Unlike traditional transcranial methods such as pterional, subfrontal, and presigmoid approaches, the endoscopic endonasal surgery allows for direct access to infra chiasmatic areas without disturbing surrounding neurovascular structures. This anatomical advantage, along with advanced imaging technology, high-quality endonasal microsurgical techniques, and specialized tools, results in a high preservation rate of endocrine function and improvements in vision, while achieving comparable tumor excision. Furthermore, utilizing

vascularized nasoseptal flaps for endoscopic skull base reconstruction has significantly decreased the incidence of cerebrospinal fluid leaks, establishing endoscopic endonasal surgery as a safe and effective option for addressing these complex lesions. The extended endoscopic endonasal approach addresses the limitations of the transsphenoidal route, enabling the treatment of various purely suprasellar and retrosellar cystic or solid craniopharyngiomas, regardless of the sellar size or the patient's pituitary function [6, 8, 9].

Postoperative CSF leakage is a frequent, serious, and costly complication resulting in a higher risk of meningitis and a longer hospital stay. The cause of this complication is either lack of recognition of a perioperative CSF leak or an incomplete closure of the leak, but small perioperative CSF leaks are not always noticeable without enhanced visualization. One study show postoperative CSF leakage is 7.3%. Other authors report rates ranging from 1.4 to 16.9% [10]. All patients in these case series didn’t show any CSF leakage or any adverse event post operation. This may be due to sample in this case series was only 3 patients, in other ways, other study was use more than 300 patients.

3. Conclusion

Transphenoid approach was a good surgical method for sellar region masses and show good outcomes after operation.

References

[1] Ugga L, Franca RA, Scaravilli A, et al. Neoplasms and tumor-like lesions of the sellar region: imaging findings with correlation to pathology and 2021 WHO classification. Neuroradiology 2023; 65: 675–699.

[2] Louis DN, Perry A, Wesseling P, et al. The 2021 WHO Classification of Tumors of the Central Nervous System: a summary. Neuro Oncol 2021; 23: 1231–1251.

[3] Cote DJ, Iuliano SL, Catalino MP, et al. Optimizing pre-, intra-, and postoperative management of patients with sellar pathology undergoing transsphenoidal surgery. Neurosurg Focus 2020; 48: E2.

[4] Rawanduzy CA, Couldwell WT. History, Current Techniques, and Future Prospects of Surgery to the Sellar and Parasellar Region. Cancers (Basel) 2023; 15: 2896.

[5] Lee DK, Sung MS, Park SW. Factors Influencing Visual Field Recovery after Transsphenoidal Resection of a Pituitary Adenoma. Korean Journal of Ophthalmology 2018; 32: 488.

[6] Al-Bader D, Hasan A, Behbehani R. Sellar masses: diagnosis and treatment. Frontiers in Ophthalmology; 2. Epub ahead of print 24 November 2022. DOI: 10.3389/fopht.2022.970580.

[7] Müller HL. Childhood craniopharyngioma—current concepts in diagnosis, therapy and follow-up. Nat Rev Endocrinol 2010; 6: 609–618.

[8] Fernandez-Miranda JC, Gardner PA, Snyderman CH, et al. Craniopharyngioma: A pathologic, clinical, and surgical review. Head Neck 2012; 34: 1036–1044.

[9] Cavallo LM, Solari D, Esposito F, et al. The Role of the Endoscopic Endonasal Route in the Management of Craniopharyngiomas. World Neurosurg 2014; 82: S32–S40.

[10] Van Gerven L, Qian Z, Starovoyt A, et al. Endoscopic, Endonasal Transsphenoidal Surgery for Tumors of the Sellar and Suprasellar Region: A Monocentric Historical Cohort Study of

369 Patients. Front Oncol; 11. Epub ahead of print 7 May 2021. DOI: 10.3389/fonc.2021.643550.