# A Case Series of 11 Pituicytoma Outcomes by Subtype

Jack D Sedwick III, BA[1]; Kyle Montgomery, BS[1]; Rya W Berrigan, BS[1]; Christopher Seward, MD[2]; Eric D Lassiter, BS[1]; Tyler Lazaro, MD[2]; Thomas Hanks, BS[1]; Dominic Nistal, MD[2]; Manuel Ferreira Jr, MD, PhD[2]; Samuel Emerson, MD, PhD[2]; Jacob Ruzevick, MD[2];
University of Washington School of Medicine[1]; University of Washington Department of Neurological Surgery[2]

UW Medicine
NEUROLOGICAL SURGERY

## Introduction

Tumors of the posterior pituitary gland are a rare, non-endocrine, and benign spectrum of tumors arising from cells of the neurohypophesis and infundibulum. The 2025 WHO classification describes four distinct subtypes of posterior pituitary tumors. These include pituicytoma, granular cell tumor of the sellar region, spindle cell oncocytoma, and ependymal pituicytoma. Distinguished by histological features, include diffuse expression of thyroid transcription factor 1 (TTF-1). [1]

Their clinical presentation varies and radiographic diagnosis is unreliable due to imaging similarity with pituitary adenomas. Both may cause symptoms related to mass effect, most commonly on the optic chiasm (due to suprasellar growth), or symptoms of hormone deficiency due to compression of the anterior pituitary gland or disruption of biochemical signaling in the infundibulum. Due to their infundibulum and posterior pituitary site of origin, patients with posterior pituitary tumors also frequently present with diabetes insipidus (DI). DI on initial presentation of pituitary adenomas is rare as the more common symptomatic presentation is classically related to mass effect or syndromes of hormone excess (acromegaly, hyperprolactinemia, or Cushing's disease). [2,3]

Due to their rarity, pituicytoma (PD), granular cell tumor of the sellar region (GCP), spindle cell oncocytoma (SCO), and ependymal pituicytoma (EP) are understudied, making their clinical identification and outcomes difficult to predict. With advancements in advanced imaging and near universal availability of next generation sequencing to identify the mutational landscape of these understudied pathologies, the pathophysiology of these tumors continue to be elucidated. [4,5] Here, we present our single institution clinical experience of posterior pituitary tumors with clinical insights from our multidisciplinary team of pathologists, endocrinologists, ophthalmologists, otolaryngologists, and neurosurgeons.

## Methods and Materials

This is a single center Retrospective Case Series under IRB approval (STUDY00020719) evaluating patients who underwent surgical treatment of Pituicytoma within the University of Washington Department of Neurological Surgery from 1994-2025. The electronic medical record was queried for patient demographics, preoperative reports, perioperative endocrinologic, ophthalmologic, radiographic, and surgical outcomes.

All pathology was reviewed by a board-certified neuro-pathologist to be reclassified according to the 2025 WHO classification.

Operative data including approach (craniotomy versus ETSS) and resection extent (GTR versus STR) was extracted. GTR was defined as no evidence of residual tumor visible intra-operatively or on follow-up imaging.

Postoperative outcomes including visual disturbances, hypopituitarism requiring long-term (> 1 year) hormone replacement, and progression free survival defined as radiographically recurrence from serial MRIs post-operatively was evaluated.

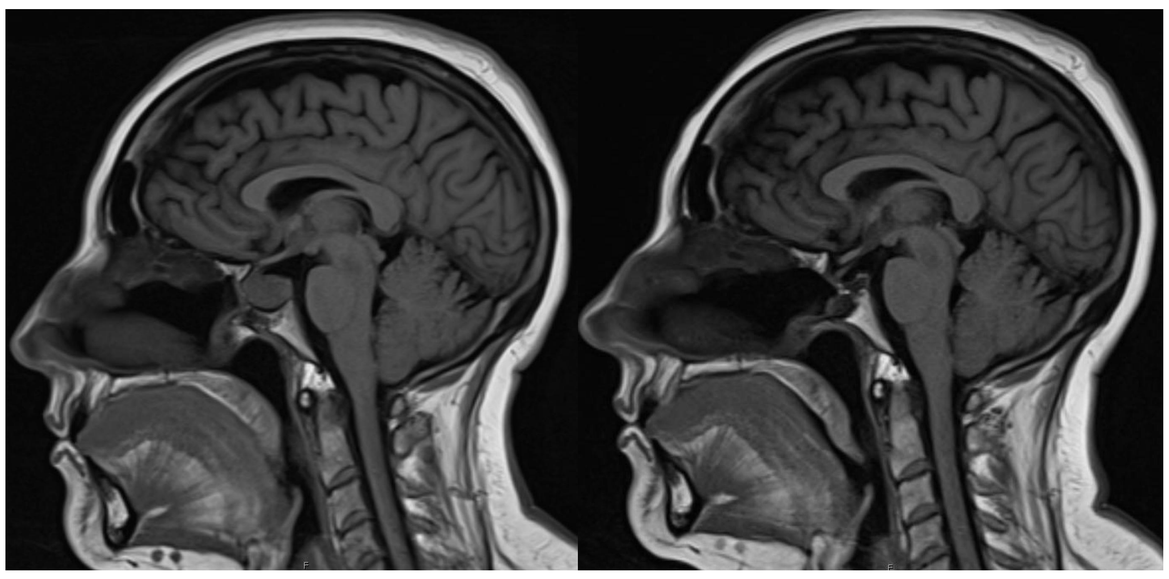

**Figure 1**: Above is a case example of a patient who underwent successful GTR via ETSS for treatment of their ependymal pituicytoma. This patient has been progression free for 31 months post-operatively.

## Results

A cohort of 11 symptomatic pituicytomas underwent surgical resection, 8 via ETSS and 3 via craniotomy. All cases performed prior to 2012 were approached via craniotomy and all subsequent cases were transsphenoidal approaches. Five patients achieved gross total resection (GTR) and 6 patients subtotal resection. Six patients required at least one hormone replacement postoperatively. Ten patients had long-term follow-up for an average 26.1 (±27.3) months, and none experienced recurrence. One patient was not followed due to mortality from unrelated medical comorbidities. The case series data is summarized in Table 1 subdivided into the unique types of pituicytoma derived tumors.

| | PD | SCO | GCP | EP |
|---|---|---|---|---|
| N | 4 | 2 | 4 | 1 |
| Male | 1 (25%) | 2(100%) | 2 (50%) | 0 |
| Age at Presentation (SD) | 61.6 (10.1) | 64.0 (5.4) | 56.5 (14.4) | 40.6 |
| Presenting Symptoms | | | | |
| Visual Disturbances | 3 (75%) | 1 (50%) | 3 (75%) | 0 |
| Hypopituitarism | 4 (100%) | 2 (100%) | 3 (75%) | 1 |
| Surgical Approach | | | | |
| ETSS | 3 (75%) | 2 (100%) | 2 (50%) | 1 |
| Craniotomy | 1 (25%) | 0 | 2 (50%) | 0 |
| GTR | 1 (25%) | 1 (50%) | 3 (75%) | 1 |
| STR | 3 (75%) | 1 (50%) | 1 (25%) | 0 |
| Post-Operative Complications | | | | |
| Vision Disturbance | 0 | 0 | 0 | 0 |
| Hypopituitarism | 3 (75%) | 1 (50%) | 2 (50%) | 1 |
| Follow-up | | | | |
| PFS in months (SD) | 57.1 (±86.0) | 9.3 (±8.0) | 28.8 (±33.8) | 31.4 |
| Recurrence | 0 | 0 | 0 | 0 |

**Table 1.** Displays demographics and outcomes subdivided by the four subtypes of pituicytoma evaluated. Progression Free Survival was not available for one patient with pituicytoma.

## Discussion

In our cohort, there was no recurrence after GTR or STR with either ETSS or craniotomy suggesting this is effective at mitigating long-term recurrence.

One patient earlier in the cohort underwent post-operative radiation for residual due to the limited data on recurrence of these tumors. They have been progression free for 156 months post initial operation.

Hypopituitarism was a common presenting symptom in our cohort indicating the mass effect of pituicytoma on the anterior pituitary, and post-operative endocrine disturbances requiring long term hormone replacement therapy were significant.

After 2011 ETSS was the preferred surgical treatment showing the evolution of treatment for these tumors as this is now the standard of care.

There was no significant differences in presentation, treatment, or outcomes between the four posterior pituitary subtypes subtypes

## Conclusions

Pituicytoma subtypes typically present due to mass effect and are safely treated via ETSS or craniotomy approaches with limited recurrence. This could indicate the utility of biopsy alone in the management of these tumors depending on patient preference and present symptoms.

Future directions should include evaluation of more cases for more generalizable results to validate these claims. Our team is also consolidating an updated review of similar cases that fit under the updated WHO guidelines.

## Contact

Jack Sedwick
University of Washington School of Medicine
1959 NE Pacific St, Seattle, WA 98195
jsedwick@uw.edu

## References

1. WHO Classification of Tumours Editorial Board, eds. *Endocrine and Neuroendocrine Tumours: WHO Classification of Tumours*. 5th ed. Vol 10. International Agency for Research on Cancer, World Health Organization; 2025. ISBN-13: 978-92-832-4524-7.
2. Siba El Hussein, Cristina Vincentelli, Pituicytoma: Review of commonalities and distinguishing features among TTF-1 positive tumors of the central nervous system, Annals of Diagnostic Pathology, Volume 29, 2017, Pages 57-61, ISSN 1092-9134,
3. Salge-Arrieta, F.J., Carrasco-Moro, R., Rodríguez-Berrocal, V. *et al.* Clinical features, diagnosis and therapy of pituicytoma: an update. *J Endocrinol Invest* **42**, 371–384 (2019). https://doi-org.offcampus.lib.washington.edu/10.1007/s40618-018-0923-z
4. Schmid S, Solomon DA, Perez E, *et al.* Genetic and epigenetic characterization of posterior pituitary tumors. Acta Neuropathol. 2021 Dec;142(6):1025-1043. doi: 10.1007/s00401-021-02377-1. Epub 2021 Oct 18. PMID: 34661724; PMCID: PMC8568760.
5. Viaene AN, Lee EB, Rosenbaum JN, Nasrallah IM, Nasrallah MP. Histologic, immunohistochemical, and molecular features of pituicytomas and atypical pituicytomas. Acta Neuropathol Commun. 2019 May 2;7(1):69. doi: 10.1186/s40478-019-0722-6. PMID: 31046843; PMCID: PMC6498683.