

# Pituitary adenoma and meningioma collision tumor: An additional case and systematic review of the literature



## Introduction

Collision tumors are tumors that feature 2 distinct tumor types in the same location. This can occur via two possibilities: metastases between two tumors, or two adjacent tumors colliding and growing together.<sup>4</sup> Collision tumors are rare, and those featuring concurrent meningiomas and pituitary adenomas are especially so, as there have only been 10 reported cases in the literature

## Methods and Materials

We present an additional case of a 61-year-old male with a pituitary adenoma/meningioma collision tumor resected via single approach endoscopic/endonasal for transsphenoidal resection of sellar mass with transtuberulum/transplanum extension. We performed a systematic literature review in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines in order to identify published cases of collision tumors in adult population.

## Results

Including the present case, 22 cases of pituitary adenoma/meningioma collision tumors are present in literature. The average age of presentation is 55 years, and 82% of cases are female. Fifty-nine percent of cases were non-functioning tumors. These cases demonstrated a wide variety of growth patterns including ventral, lateral and retrosellar growth, and it was frequently unclear if 2 separate tumors were present on imaging. Treatment strategy was also variable as 50% were treated surgically via transsphenoidal approach alone, 18% were treated with craniotomy alone, and 32% were treated with combined transsphenoidal and craniotomy.

References	Clinical Presentation	Age (yrs)	Sex	Prior radiation or malignancy	Type of Adenoma	Imaging Location (Pituitary/Meningioma)	Surgical Approach
Zentner et al., 1989	HA, visual loss	61	F	None	P	Sellar	Transsphenoidal and Craniotomy
Zentner et al., 1989	HCP, oculomotor paresis, arm weakness, somnolence	46	M	None	P	Sellar, suprasellar, Planum	Craniotomy
Zentner et al., 1989	Ataxia, visual loss	63	F	None	NF	Sella, suprasellar, Parasellar	Transsphenoidal and Craniotomy
Cannavo et al., 1993	Acromegaly, HA, Visual loss	47	F	None	GH	Sellar, Suprasellar, cavernous sinus, retrosellar	Craniotomy
Prevedello et al., 2007	HA, visual loss	52	F	None	NF	Sellar, Tuberculum sella, planum	Transsphenoidal
Mahvash et al., 2014	Visual loss, HA	36	F	None	NF	Sellar, Tuberculum sella	Transsphenoidal
Karsy et al., 2015	AMS, mutism, HCP, bladder incontinence	70	F	None	NF	Sellar, suprasellar, bilateral cavernous sinus	Transsphenoidal
Ruiz-Juretschke et al., 2015	Visual loss	61	F	None	NF	Sellar, Suprasellar, planum	Transsphenoidal
Lim et al., 2016	Visual loss, vertigo	65	F	None	NF	Sellar, Tuberculum sella	Transsphenoidal
Amirjamshidi et al., 2017	Oligomenorrhea, HA, diplopia, visual loss	37	F	None	P	Sellar, suprasellar, diaphragma sella	Craniotomy
Amirjamshidi et al., 2017	Acromegaly	42	F	None	GH	Sellar, suprasellar, diaphragma sella	Transsphenoidal and Craniotomy
Zhao et al., 2017	Acromegaly, snoring, headache	58	F	None	GH	Sellar, cavernous sinus	Transsphenoidal and Craniotomy
Zhao et al., 2017	Acromegaly, HA	58	F	Thyroid Adenoma,	GH	Sellar, cavernous sinus	Transsphenoidal, craniotomy
Gezer et al., 2020	Weight gain, menstrual irregularity, weakness	34	F	None	C	Sellar, tuberculum sella	Transsphenoidal
Bao et al., 2021	Visual loss	62	F	None	NF	Sellar, Tuberculum sella	Transsphenoidal
Bao et al., 2021	HA, visual loss	56	F	None	NF	Sellar, Suprasellar, cavernous sinus	Transsphenoidal
Lu et al., 2022	Vision loss	61		None	NF	Sellar, suprasellar, cavernous sinus, planum	Transsphenoidal and Craniotomy
Aydin et al., 2023	Headache, vision loss	65	M	None	NF	Sellar, suprasellar, cavernous sinus, anterior skull base	Transsphenoidal and Craniotomy
De Vries 2023	Depression, fatigue, weight loss, hypopituitarism	75	F	None	NF	Sellar, Suprasellar, Planum	Transsphenoidal and transplanum
Baldawa et al., 2024	Visual loss	50	F	Prior irradiation	NF	Sellar, suprasellar	Transsphenoidal
Chatain et al., 2024	Vision loss	47	M	None	G	Sellar, suprasellar, cavernous sinus	Craniotomy
Present Case	Vision loss	61	M	NA	NF	Sellar, Suprasellar	Transsphenoidal and Transplanum, transtuberulum

Table 1: Results of PRISMA search of combined pituitary adenoma/meningioma collision tumors

Abbreviations: NA – Not available, NF – Non-functioning, GH – Growth hormone, AMS – Altered mental status, G – Gonadotroph, HCP – Hydrocephalus, HA – Headache, C – Corticotroph, P – Prolactinoma

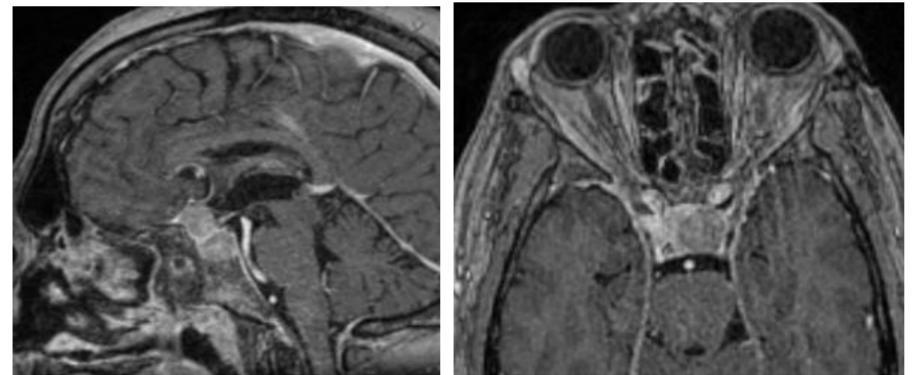


Figure 1: preoperative MRI T1 post contrast demonstrating combined sellar/suprasellar mass with extension of dural tail onto the planum sphenoidale

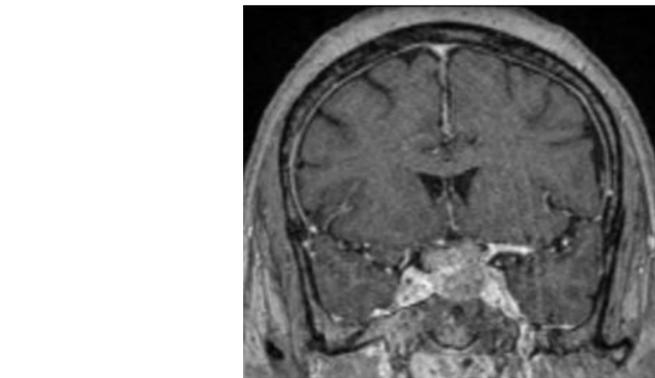


Figure 2: postoperative MRI T1 post contrast demonstrating following transsphenoidal, transplanum, transtuberulum approach for resection. Gross total resection achieved

## Conclusions

Pituitary adenoma/meningioma collision tumors present a wide range of presentations and growth patterns which strongly affects the surgical decision making. It is not always readily evident on imaging that 2 distinct tumors are present, so surgeons must have a high level of suspicion for this entity to guide surgical planning.

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