ORIGINAL RESEARCH PAPER
Volume - 15 | Issue - 07 | July - 2026 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMMON TRAPS IN NOT-SO-COMMON SELLAR AND SUPRASELLAR PATHOLOGIES: AN MRI-BASED DIAGNOSTIC APPROACH

Radio-Diagnosis

Prafull Dileep Patil* Resident doctor Department of Radiodiagnosis, SBKS Medical Institute & Research Centre, Sumandeep Vidyapeeth University, Vadodara, Gujarat, India*Corresponding Author

Parth Chandubhai Savaliya Resident doctor Department of Radiodiagnosis, SBKS Medical Institute & Research Centre, Sumandeep Vidyapeeth University, Vadodara, Gujarat, India

Abhay S. Chandibhamar Resident doctor Department of Radiodiagnosis, SBKS Medical Institute & Research Centre, Sumandeep Vidyapeeth University, Vadodara, Gujarat, India

ABSTRACT

Background: The sellar and suprasellar region contains critical neuroendocrine structures. Although pituitary adenomas are the most common lesions, several uncommon pathologies may mimic adenomas clinically and radiologically. **Aim:** To highlight uncommon sellar and suprasellar lesions and describe MRI findings useful for diagnosis.**Materials and Methods:** Five representative cases were retrospectively reviewed with emphasis on clinical presentation, MRI findings, differential diagnosis, and final diagnosis. **Results:** Cases included lymphocytic hypophysitis, neurosarcoidosis, pilocytic astrocytoma, Rathke's cleft cyst, and pituitary stalk interruption syndrome. **Conclusion:** Structured MRI assessment improves diagnostic accuracy and helps avoid inappropriate management.

KEYWORDS

Sellar Lesions, Suprasellar Lesions, Mri, Hypophysitis, Neurosarcoidosis, Rathke's Cleft Cyst, Pilocytic Astrocytoma, Pituitary Stalk Interruption Syndrome

INTRODUCTION

The sellar and suprasellar region contains the pituitary gland, hypothalamus, optic chiasm, and infundibular stalk. MRI remains the imaging modality of choice because of excellent soft tissue contrast and multiplanar capability. While pituitary adenomas account for most lesions, inflammatory, congenital, granulomatous, and neoplastic conditions may closely mimic adenomas. Accurate diagnosis is essential because management strategies vary substantially among these entities.

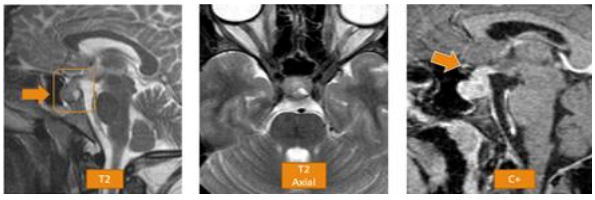
Materials and Methods

Five patients with uncommon sellar and suprasellar lesions were retrospectively reviewed. MRI examinations included conventional T1-weighted, T2-weighted, FLAIR, diffusion-weighted imaging where indicated, and contrast-enhanced sequences.

Case 1: Lymphocytic Hypophysitis

A 33-year-old female presented with galactorrhea and headaches. MRI demonstrated symmetrical pituitary enlargement with intense enhancement and marked stalk thickening. Findings favored lymphocytic hypophysitis over macroadenoma. Corticosteroid therapy resulted in lesion regression.

Figure 1: Magnetic resonance images of a 33-year-old female with lymphocytic hypophysitis. **(1A)** Sagittal T2-weighted image demonstrates diffuse symmetrical enlargement of the pituitary gland with thickening of the infundibular stalk (arrow). **(1B)** Axial T2-weighted image shows homogeneous enlargement of the pituitary gland without focal mass formation. **(1C)** Contrast-enhanced sagittal T1-weighted image demonstrates diffuse homogeneous enhancement of the enlarged pituitary gland and thickened stalk (arrow).

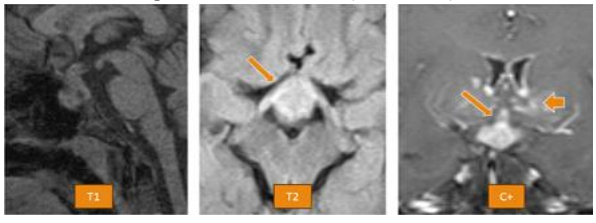


1A 1B 1C

Case 2: Neurosarcoidosis

A 29-year-old female presented with amenorrhea, infertility, and visual impairment. MRI revealed a homogeneously enhancing sellar-suprasellar lesion with stalk thickening, absent posterior pituitary bright spot, and optic pathway involvement. Histopathology confirmed neurosarcoidosis.

Figure 2: Magnetic resonance images of a 29-year-old female with neurosarcoidosis involving the hypothalamic-pituitary axis. **(2A)** Sagittal T1-weighted image demonstrates a sellar-suprasellar lesion. **(2B)** Coronal T2-weighted image shows thickening of the pituitary stalk (arrow). **(2C)** Contrast-enhanced coronal T1-weighted image demonstrates intense enhancement of the pituitary stalk (long arrow) with associated suprasellar enhancement (short arrow).

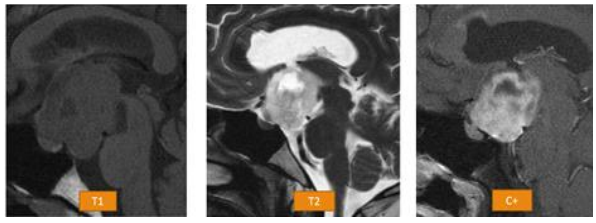


2A 2B 2C

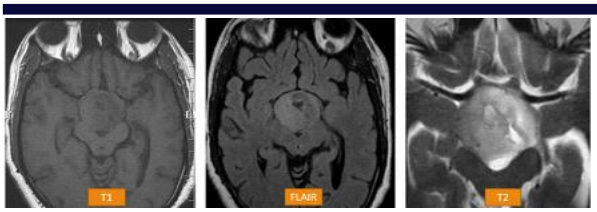
Case 3: Pilocytic Astrocytoma

A 25-year-old male presented with headache and blurred vision. MRI demonstrated a solid-cystic suprasellar lesion with strong enhancement and associated hydrocephalus. The pituitary gland was separately visualized. Histopathology confirmed pilocytic astrocytoma.

Figure 3. Magnetic resonance images of a 25-year-old male with suprasellar pilocytic astrocytoma. **(3A)** Sagittal T1-weighted image demonstrates a well-defined suprasellar mass lesion. **(3B)** Sagittal T2-weighted image shows a predominantly hyperintense solid-cystic suprasellar lesion causing mass effect on the third ventricle. **(3C)** Contrast-enhanced sagittal T1-weighted image demonstrates heterogeneous enhancement of the solid component. (3D) Axial T1-weighted image shows the suprasellar extent of the lesion. **(3E)** Axial FLAIR image demonstrates the central suprasellar location and relationship to adjacent basal cisterns. **(3F)** Axial T2-weighted image further depicts the hyperintense cystic component of the lesion.



3A 3B 3C

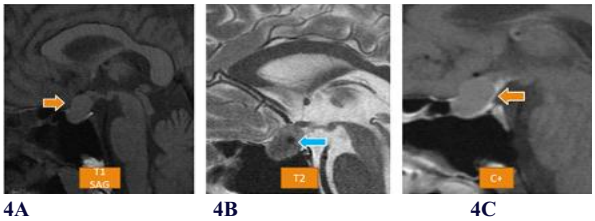


3D 3E 3F

Case 4: Rathke's Cleft Cyst

A 31-year-old male presented with chronic headache. MRI showed a figure-of-eight intrasellar cyst with an intracystic nodule and peripheral claw sign. Findings favored Rathke's cleft cyst over cystic pituitary adenoma.

Figure 4: Magnetic resonance images of a 31-year-old male with Rathke's cleft cyst. **(4A)** Sagittal T1-weighted image demonstrates an intrasellar cystic lesion with a characteristic figure-of-eight configuration. **(4B)** Sagittal T2-weighted image demonstrates a hyperintense cyst with an intracystic nodule (arrow), a characteristic feature of Rathke's cleft cyst. **(4C)** Contrast-enhanced sagittal T1-weighted image demonstrates thin peripheral rim enhancement ("claw sign") representing compressed normal pituitary tissue, with no enhancing solid component,

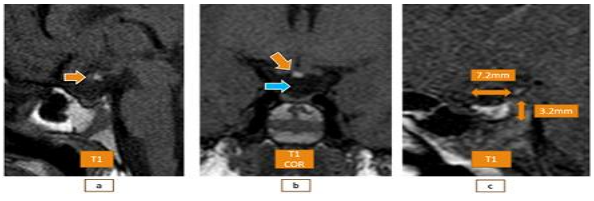


4A 4B 4C

Case 5: Pituitary Stalk Interruption Syndrome

A 14-year-old male with short stature and delayed puberty demonstrated absent pituitary stalk, hypoplastic anterior pituitary, and ectopic posterior pituitary. These findings established the diagnosis of pituitary stalk interruption syndrome.

Figure 5: Magnetic resonance images of a 14-year-old male with pituitary stalk interruption syndrome. **(5A)** Sagittal T1-weighted image demonstrates absence of the normal pituitary stalk (arrow). **(5B)** Coronal T1-weighted image demonstrates an ectopic posterior pituitary bright spot (orange arrow) with a hypoplastic anterior pituitary gland (blue arrow). **(5C)** Sagittal T1-weighted image demonstrates a hypoplastic anterior pituitary gland with reduced dimensions (approximately 7.2 mm in width and 3.2 mm in height).



5A 5B 5C

DISCUSSION

The sellar and suprasellar region encompasses the pituitary gland, hypothalamus, optic chiasm, infundibulum, and adjacent vascular structures. Although pituitary adenomas constitute the majority of sellar masses, several inflammatory, developmental, and neoplastic lesions may closely mimic adenomas on clinical presentation and MRI. Accurate radiological differentiation is important because management strategies vary considerably among these entities.

MRI remains the imaging modality of choice for evaluating sellar and suprasellar lesions because of its excellent soft tissue contrast and multiplanar capability. A systematic assessment of lesion location, enhancement pattern, pituitary stalk morphology, posterior pituitary bright spot, optic pathway involvement, and associated intracranial abnormalities can significantly narrow the differential diagnosis.

Lymphocytic hypophysitis typically presents with diffuse enlargement of the pituitary gland and thickening of the pituitary stalk. In contrast to pituitary adenomas, the gland enlargement is usually symmetrical and demonstrates homogeneous enhancement. Recognition of these imaging findings is important because many patients respond well to corticosteroid therapy, avoiding unnecessary surgery.

Neurosarcoidosis involving the hypothalamic-pituitary axis is uncommon but should be considered in patients with stalk thickening, endocrine dysfunction, and associated hypothalamic or optic pathway involvement. The absence of marked diffusion restriction and the presence of characteristic enhancement patterns may help distinguish it from primary CNS lymphoma and other infiltrative lesions.

Pilocytic astrocytoma should be considered when a well-circumscribed suprasellar mass is identified separately from the pituitary gland. The presence of cystic components, heterogeneous enhancement, and a non-infiltrative appearance favour a low-grade glioma rather than a pituitary neoplasm.

Rathke's cleft cyst is a benign developmental lesion arising from remnants of Rathke's pouch. MRI findings such as a characteristic intracystic nodule, figure-of-eight configuration, and peripheral "claw sign" produced by compressed normal pituitary tissue are valuable features that help distinguish it from cystic pituitary adenoma.

Pituitary stalk interruption syndrome is characterized by the classic imaging triad of a hypoplastic anterior pituitary gland, absent or interrupted pituitary stalk, and ectopic posterior pituitary. MRI is essential for establishing the diagnosis and guiding appropriate endocrine evaluation and long-term hormonal replacement therapy.

The present case series highlights the importance of a structured MRI-based approach when evaluating uncommon sellar and suprasellar lesions. Careful assessment of lesion origin, enhancement characteristics, stalk morphology, posterior pituitary signal, and associated intracranial findings enables more accurate diagnosis and helps avoid common diagnostic pitfalls. Although limited by the small number of cases, this series illustrates practical imaging features that may assist radiologists in differentiating uncommon lesions from more frequently encountered pituitary adenomas.

Table 1. MRI Features Useful in Differentiating Uncommon Sellar and Suprasellar Lesions from Pituitary Adenoma

Lesion	Clinical Features	Characteristic MRI Findings	Key Differentiating Feature
Pituitary Adenoma (PitNET)	Headache, visual disturbances, endocrine hyperfunction or hypopituitarism	Well-defined sellar mass, heterogeneous enhancement, possible cystic degeneration or hemorrhage, sellar expansion, cavernous sinus invasion	Focal pituitary lesion with sellar enlargement and absence of diffuse stalk thickening
Lymphocytic Hypophysitis	Young women, pregnancy/postpartum period, headache, galactorrhea, hypopituitarism	Symmetrical enlargement of the pituitary gland, diffuse homogeneous enhancement, thickened pituitary stalk, preserved or absent posterior pituitary bright spot	Diffuse gland enlargement with marked stalk thickening and steroid responsiveness
Neurosarcoidosis	Amenorrhea, infertility, diabetes insipidus, visual impairment, systemic sarcoidosis	Thickened enhancing pituitary stalk, hypothalamic involvement, absent posterior pituitary bright spot, optic pathway and leptomeningeal/perivascular enhancement, no significant diffusion restriction	Pituitary stalk thickening associated with optic pathway or leptomeningeal involvement

Pilocytic Astrocytoma	Children or young adults, headache, visual disturbances, hydrocephalus	Well-circumscribed solid-cystic suprasellar lesion, T2 hyperintense, heterogeneous enhancement, facilitated diffusion on ADC, normal pituitary gland visualized separately	Suprasellar origin with separate normal pituitary gland and non-infiltrative growth pattern
Rathke's Cleft Cyst	Often asymptomatic; headache or visual symptoms if large	Midline intrasellar cyst, variable T1/T2 signal intensity, intracystic nodule, thin peripheral rim enhancement ("claw sign"), no enhancing solid component	Intracystic nodule with peripheral "claw sign" representing compressed normal pituitary tissue
Pituitary Stalk Interruption Syndrome (PSIS)	Short stature, delayed puberty, growth hormone deficiency, hypopituitarism	Hypoplastic anterior pituitary gland, absent or interrupted pituitary stalk, ectopic posterior pituitary bright spot	Classic triad of absent stalk, hypoplastic anterior pituitary, and ectopic posterior pituitary

CONCLUSION

A structured MRI-based approach enables reliable differentiation of uncommon sellar and suprasellar lesions from common mimics. Familiarity with characteristic imaging features improves diagnostic confidence and guides optimal patient management.

Declaration of Patient Consent

Appropriate patient consent was obtained for use of anonymized clinical and imaging information.

Conflict of Interest

The authors declare no conflict of interest.

Source of Funding

No funding was received for this study.

REFERENCES

1, Eduardo DDS, Franco SB, de Castro JDV. Magnetic resonance imaging of sellar and juxtasellar abnormalities: atypical findings of common diseases and typical findings of rare diseases. **Radiol Bras.** 2018;51(1):45-51.
2. Park SK, Lee J, Choi SH, et al. Differentiation between cystic pituitary adenomas and Rathke cleft cysts using magnetic resonance imaging findings. **AJNR Am J Neuroradiol.** 2015;36(10):1866-1873.
3. Kakehi E, Adachi S, Fukuyasu Y, et al. Magnetic resonance imaging findings in patients with neurosarcoidosis presenting with central diabetes insipidus. **Endokrynol Pol.** 2019;70(5):430-437.
4. Mansour A, Qandeel M, Abdel-Razeq H, et al. MR imaging features of primary central nervous system lymphoma. **Cancer Imaging.** 2014;14:22.
5. Elster AD. Modern imaging of the pituitary gland. **Radiol Clin North Am.** 1993;31(1):1-19.
6. Bonneville JF, Cattin F, Bonneville F. **MRI of Pituitary and Parasellar Lesions.** Berlin: Springer; 2016.