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Spectrum of Intrasellar Lesions on Magnetic Resonance Imaging

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Introduction

Sellar region is a relatively small & complex area in basicranium. It contains critical neurovascular structures that directly cause various pathologies / involved in the pathology as a result of compact surroundings. Multiplanar capability & superior tissue contrast differentiation render MR imaging the preferred modality for sellar lesions. Sellar masses may be symptomatic or incidental lesions, present in about 10-15% of the adult population. The vast majority are incidentally found lesions. Approximately 90% of sellar masses are pituitary adenomas.

Often, sellar masses may occur at any age with no specific gender predilection. However, the relative frequency of specific pathologies varies by age and gender.MRI requires high-resolution images, as the pituitary gland is a small anatomical structure closely related to several critical anatomical structures. The normal anterior pituitary gland demonstrates a signal intensity similar to white matter.Whereas posterior pituitary gland appears bright in most patients owing to the presence of phospholipid within the neurosecretory granules. With the administration of gadolinium DTPA (paramagnetic contrast agent), the pituitary gland and stalk enhance or become brighter in signal intensity

Aims and Objectives

- To illustrate different intrasellar lesions on MRI

Materials and Methods

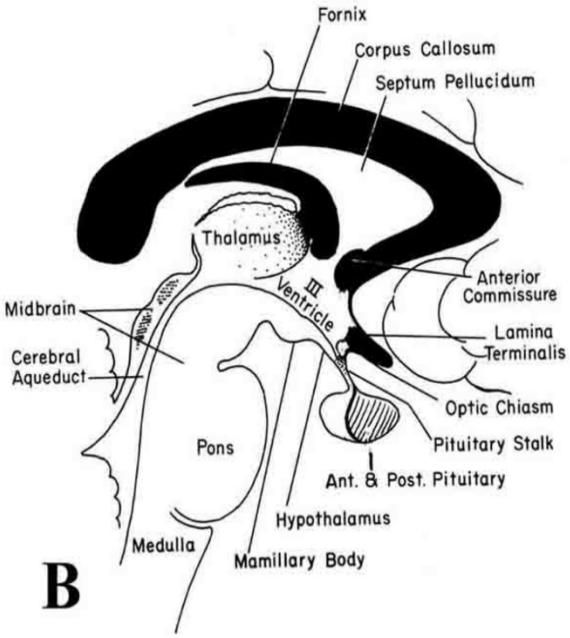
- Study design: Case series
- MR Images acquired using 1.5 T Siemens
- Patients placed in supine position on MRI table and typical protocols were done

Discussion

Patients with symptoms and signs of pituitary axis dysfunction or visual field deficits are frequently referred for diagnostic imaging. Most common indications for pituitary imaging, excluding known mass follow-up, were for evaluation of hyperprolactinemia or hypogonadism.MRI provides detailed information about the contents of sellar & parasellar regions. It is the fundamental preoperative & postoperative imaging modality. Generating differential diagnoses can be difficult because of complexity of structures in Sella. Identification of normal structures, such as pituitary gland, in relation to pathology can be helpful to determine the etiology.

Anatomy 0f Pituitary Gland

A



B

Intrasellar Lesions

Common

- Pituitary hyperplasia (Physiologic, Pathologic)
- Pituitary microadenoma
- Empty sella

Less Common

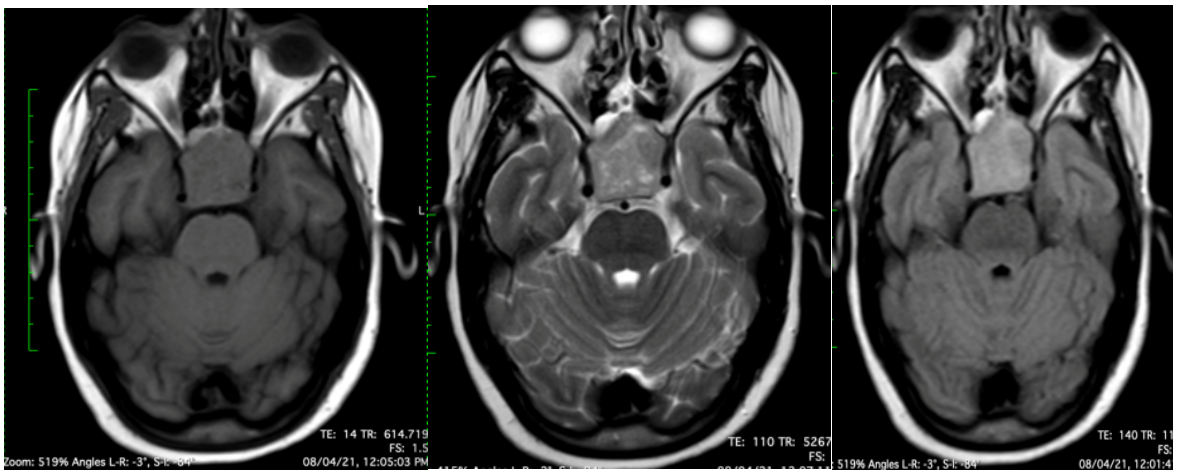
- Pituitary macroadenoma
- Rathke's cleft cyst
- Craniopharyngioma
- Neurosarcoid

Rare

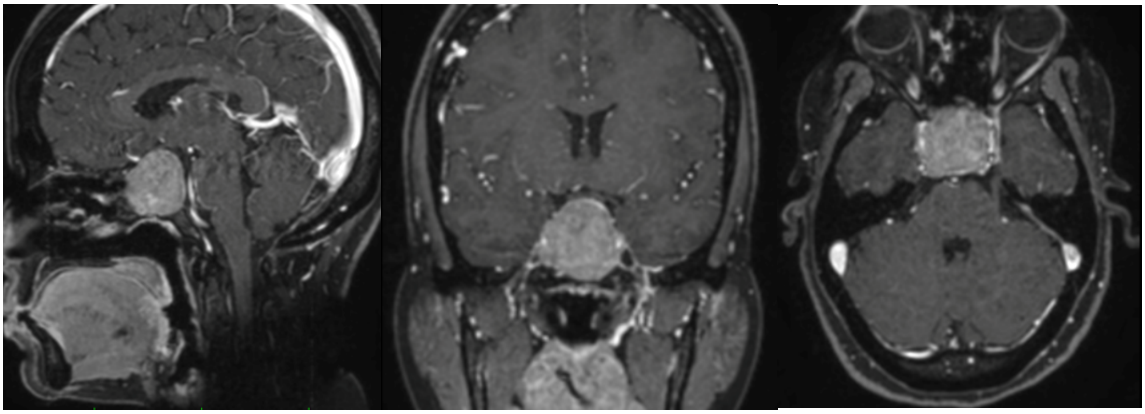
- Lymphocytic hypophysitis
- Intracranial hypotension
- Meningioma
- Metastasis, Lymphoma
- Vascular (Kissing carotids, aneurysm)

Pituitary Macroadenoma

By definition, pituitary macroadenomas are adenomas over 10mm in size. They tend to be soft, solid lesions, often with areas of necrosis / hemorrhage as they get bigger. Originate within the pituitary gland and result in expansion of the Sella. They have propensity to erode bone and typically show mild heterogeneous enhancement. Sellar enlargement, erosion, cavernous sinus invasion and lobulated margins are reliable indicators. As they are soft tumors, they indent at diaphragma sellae, giving them a 'snowman' configuration. The above feature can help distinguish between a pituitary macroadenoma and a meningioma. Another feature which can help differentiate them is enlargement of the sella turcica



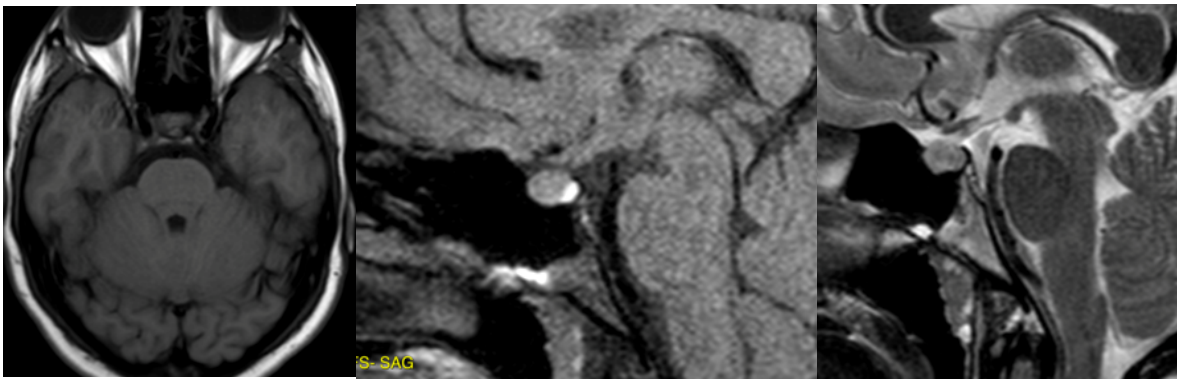
A ~32 x 30 x 27 (CC x AP xTR) relatively well defined T1 isointense, T2/FLAIR heterogeneously hyperintense soft tissue signal intensity lesion involving sellar region causing widening of Sella; Laterally the lesion extends into bilateral cavernous sinuses (KNOSP Grade 2 (Left) & Grade 3b (Right)



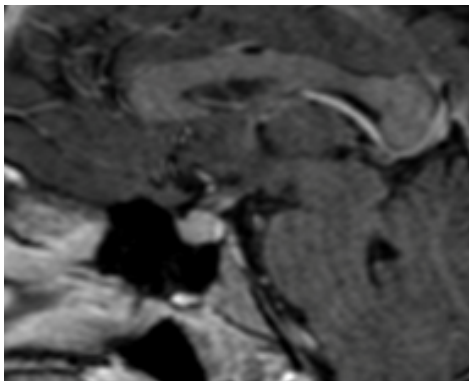
The lesion shows heterogenous enhancement; Pituitary stalk not clearly delineated from the lesion; Superiorly causing mass effect over optic chiasma

Pituitary Macroadenoma

By definition, pituitary microadenomas are less than 10 mm in diameter & located in pituitary gland. Small microadenomas may be inapparent on standard nonenhanced sequences. Many microadenomas appear slightly hypointense on T1 C+. Others enhance more strongly and may become isointense with the enhancing pituitary gland, rendering them virtually invisible. Slow-growing, benign and more likely to be functioning tumors (i.e. they produce hormones). The hormone imbalance that can be caused by pituitary microadenomas can produce a number of symptoms, often resulting in diagnosis of the tumor



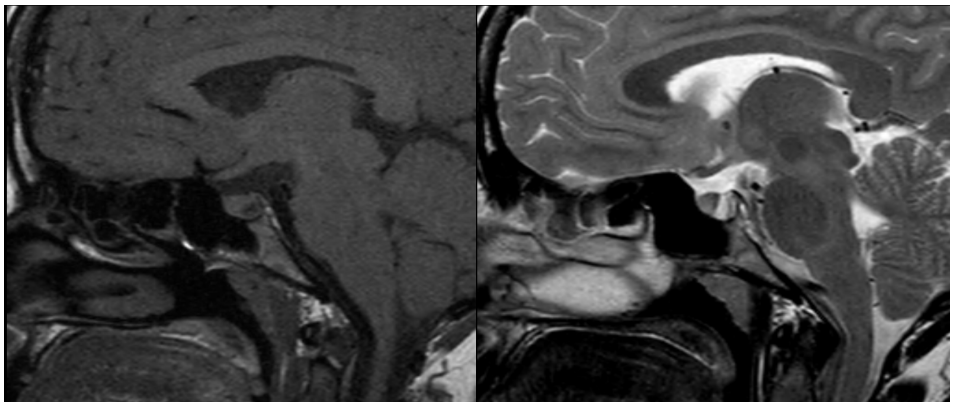
Pituitary gland shows convex upper border and a ~ 7 x 4mm partly well-defined T1 isointense, T2 relatively hyperintense lesion noted within the pituitary gland



The lesion appeared hypointense in early T1 dynamic contrast but appears same intensity as the rest of the gland on delayed sections as shown above - suggestive of delayed enhancement

Rathke Cleft Cyst

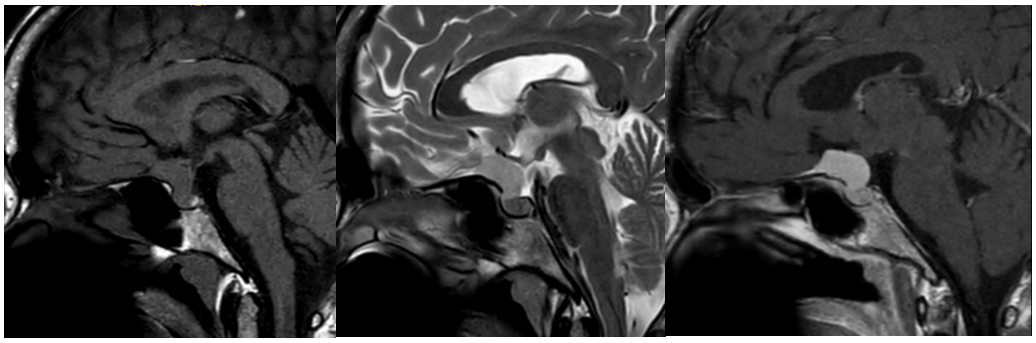
Derived from Rathke's cleft epithelium. Also known as pars intermedia cysts, non-neoplastic, sellar or suprasellar epithelium-lined cysts arising from embryologic remnants of Rathke's pouch in the pituitary gland. Can originate anywhere from the nasopharynx to the third ventricle. They contain cholesterol laden mucoid material due to which their MR signal appearance is often diagnostic. Usually incidentally identified. Cyst is fluid-filled and has very thin walls with a thickness of only one or two cell layers



A ~ 5.1 x 7 x 7.8 mm (AP X TR X CC) relatively well defined T1 hypointense and T2 hyperintense cystic lesion noted within the pituitary gland

Meningioma

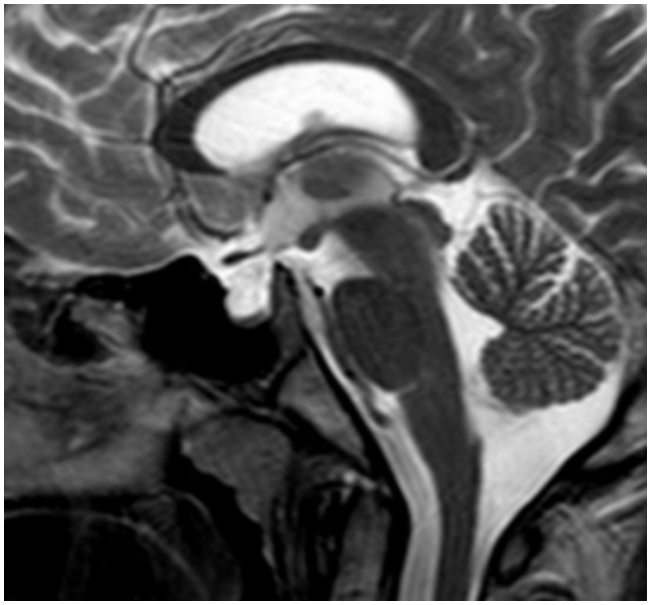
Meningiomas are benign lesions that can present as sellar/suprasellar masses. They can arise from the tuberculum sella, planum sphenoidal, or diaphragma sellae. Laterally, they may also grow from the medial sphenoid ridge and cavernous sinus and project into the sella. Intrasellar meningiomas are rare but have been reported. Meningiomas are more common in women and usually present in adult life. Peak age at diagnosis between 40 and 50 years



An extra axial T1 isointense and T2 hyperintense suprasellar lesion noted with intrasellar extension; Post contrast the lesion shows homogeneous enhancement and dural tail. The mass is seen causing compression over adjacent optic chiasma (more on the right side)

Empty Sella

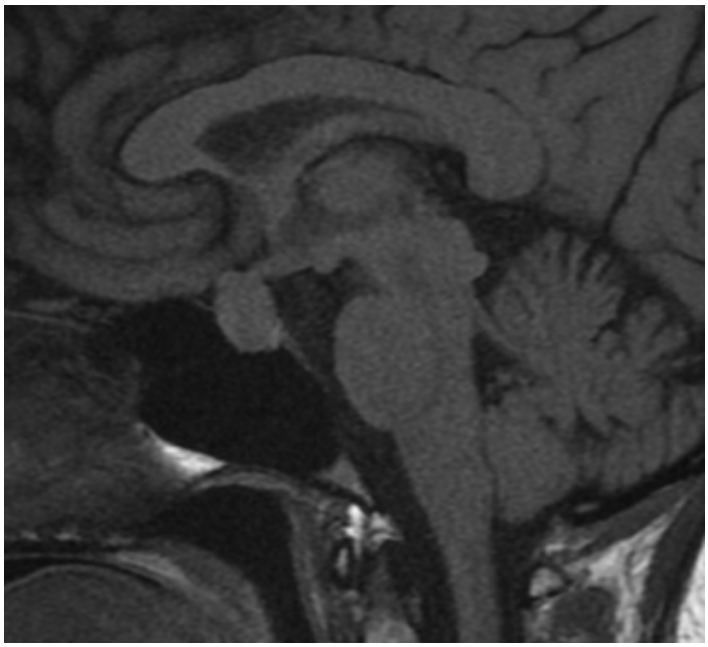
An empty sella is an arachnoid-lined, CSF-filled protrusion that extends from the suprasellar cistern through the diaphragma sellae into the sella turcica. Rarely completely "empty“. A small remnant of flattened pituitary gland is almost always present at the bottom of the bony sella, even if it is inapparent on imaging studies. Therefore, the term "partially empty sella" is anatomically more accurate



CSF signal intensity noted within the sellar region. Compressing the pituitary gland against the floor of sella (Max . thickness ~1.5mm)

Pituitary Hyperplasia

Pituitary hyperplasia is a nonneoplastic increase in adenohypophysial cell number. It can be normal physiologic or pathologic. Physiologic - enlargement secondary to prolactin (PRL) cell hyperplasia also occurs during pregnancy and lactation or in response to exogenous estrogen treatment. Pathologic hyperplasia most commonly occurs in response to end-organ failure ; Primary hypothyroidism is the most common cause of pathologic pituitary hyperplasia . MR demonstrates an enlarged pituitary gland that bulges upward and is isointense with cortex on both T1- and T2WI. Dynamic contrast-enhanced MR scans with 2- to 3-mm slice thickness and small field of view show that the gland enhances homogeneously



Pituitary gland is enlarged with convex upper border in a lactating women who is 3 weeks post partum – representing hyperplasia

Conclusion

- Preoperative differentiation of histologic etiology of masses involving sella turcica and suprasellar region is of clinical importance because it determines the use of surgery versus nonsurgical techniques, a transsphenoidal versus an intracranial surgical approach, and the degree of resection
- MRI examination is generally the best study to characterize the majority of sellar masses
- So, the knowledge of various characteristic imaging features of intrasellar lesions on magnetic resonance imaging are of profound importance

References

1. Thakkar K, Ramteke-Jadhav S, Kasaliwal R, et al. Sellar surprises: a single-centre experience of unusual sellar masses. *Endocr Connect*. 2020;9(2):111-121. doi:10.1530/EC-19-0497
2. Bresson D, Herman P, Polivka M, Froelich S. Sellar Lesions/Pathology. Otolaryngol Clin North Am. 2016 Feb;49(1):63-93. doi: 10.1016/j.otc.2015.09.004. PMID: 26614829.
3. Abushamat LA, Kerr JM, Lopes MBS, Kleinschmidt-DeMasters BK. Very Unusual Sellar/Suprasellar Region Masses: A Review.

J Neuropathol Exp Neurol. 2019 May 20:nlz044. doi: 10.1093/jnen/nlz044. Epub ahead of print. PMID: 31233145

4. Tominaga JY, Higano S, Takahashi S. Characteristics of Rathke's cleft cyst in MR imaging. Magn Reson Med Sci. 2003 Apr 1;2(1):1-8. doi: 10.2463/mrms.2.1. PMID: 16210813.
5. Johnsen DE, Woodruff WW, Allen IS, Cera PJ, Funkhouser GR, Coleman LL. MR imaging of the sellar and juxtasellar regions. Radiographics. 1991 Sep;11(5):727-58. doi: 10.1148/radiographics.11.5.1947311. PMID: 1947311