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Case series; Imaging in lesser-known ailments of the pituitary gland and sellar region

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Case series; Imaging in lesser-known ailments of the pituitary gland and sellar region

Keywords

pitutary region, Sella, stalk, tuberculosis, ectopic pituitary, Rathke cleft cyst.

Authors

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TITLE: Case series; Imaging in lesser-known ailments of the pituitary gland and sellar region.

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ABSTRACT:

Background: Sellar region is constituted by intrasellar suprasellar and infundibular stalk region. It consist important neuroendocrine pathway which includes hypothalamus, pituitary stalk and pituitary gland. Lesions in this region cause endocrine disruption. It is necessary to know uncommon and rare pathologies to help differentiate non neoplastic cystic lesion, infection and tumours at this region to aid in deciding surgical and non-surgical treatment and to avoid therapeutic misadventure. It becomes critical to make an accurate diagnosis.
Conclusions: Hence, this case series brings to light a short review of literature on Pituitary region lesions, including its clinical presentation, imaging findings and differential diagnosis.
Keywords: pitutary region,Sella,stalk,tuberculosis, ectopic pitutary,Rthke cleft cyst.

Background:

The sellar region is one of the most anatomically complex areas of the brain. These includes pituitary gland and structures surrounding it like cavernous sinus, suprasellar cistern and hypothalamus. Most common lesions in the region which constitutes 75-80% are macroadenoma, meningioma, aneurysm, craniopharyngioma and astrocytoma. Infection and Rathke's cleft cyst constitute less than 1-2%. Pituitary stalk abnormalities are more common in male child with multiple hormone deficiencies[1].

By accurately diagnosing uncommon sellar region pathologies by imaging findings will help in making the appropriate treatment decisions without the need of neurosurgical intervention.

Methods: For all below mentioned cases MRI was performed on (Ingenia Philips 3T medical systems)

Case presentation and Discussion:

- **Case 1: Primary tuberculosis of pituitary region.**

  A 29 year-old female patient presented with headache and fever since 1 week and altered sensorium since 1 day. MRI revealed a rim enhancing sellar and suprasellar lesion involving the hypothalamus, mammillary body, pituitary stalk and posterior pituitary gland with central restriction diffusion and loss of posterior pituitary bright spot; altered signal intensity with heterogeneous enhancement of clivus noted(Fig. 1). It was diagnosed as infective etiology likely tuberculosis. CSF analysis proved to tuberculosis. Further on CT thorax was done, which was

normal. This is a rare case of primary pituitary region tuberculosis. The patient was managed conservatively with Anti-tubercular treatment (ATT). Patient improved symptomatically.

Tuberculosis is a most common infectious disease caused by Mycobacterium tuberculosis. The lungs are the most common sites for M. tuberculosis infection[2]. Extra-pulmonary infection, representing about 20% of immunocompetent patients, can occur in any organ with or without overt pulmonary involvement Pituitary tuberculoma is extremely rare, even in endemic regions of tuberculosis[3]. Differential diagnosis included inflammatory and granulomatous lesions of pituitary gland, including lymphocytic hypophysitis, pituitary abscess, fungal infection, sarcoidosis, Wegener's granulomatosis and Langerhans' cell histiocytosis[3].

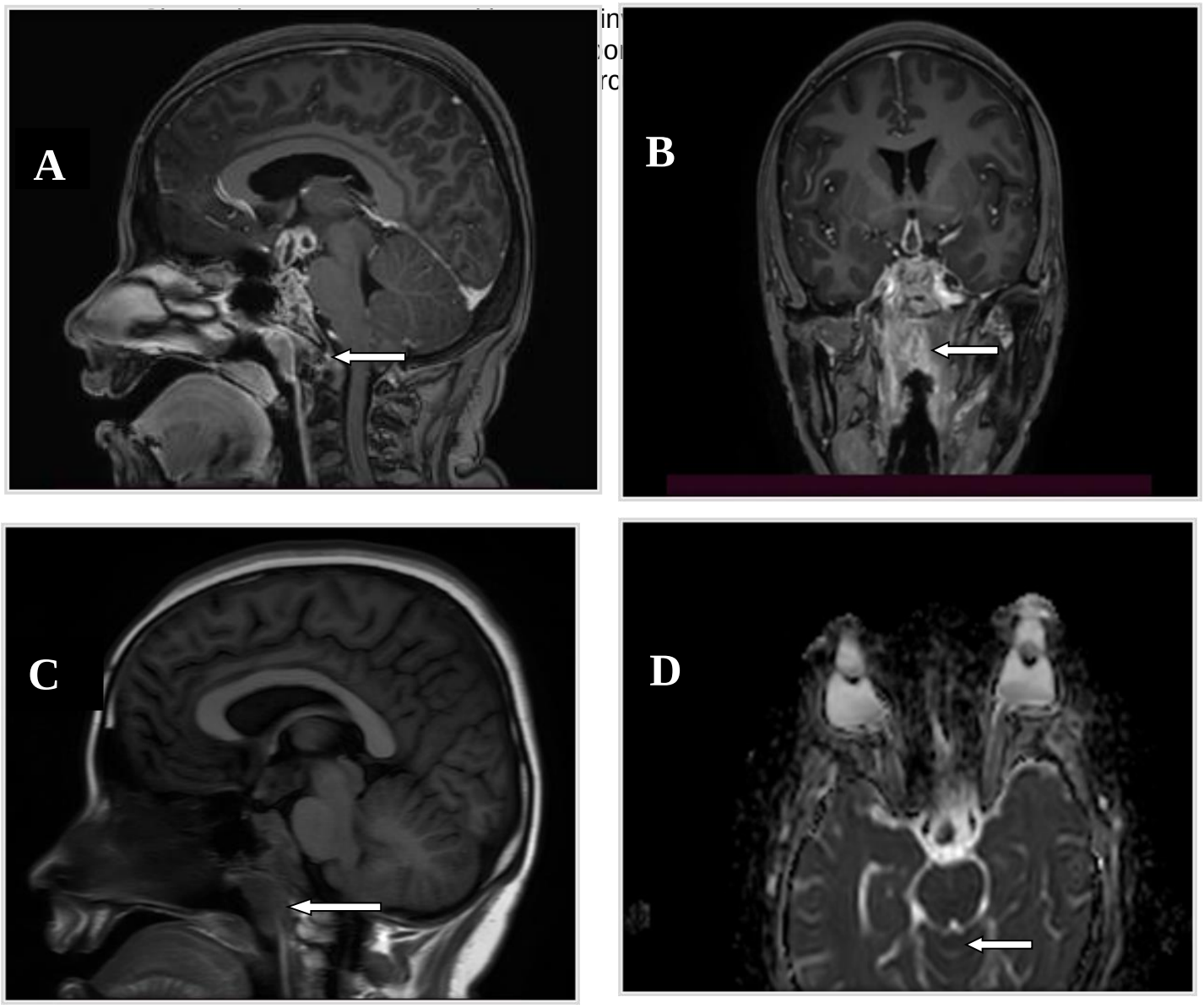
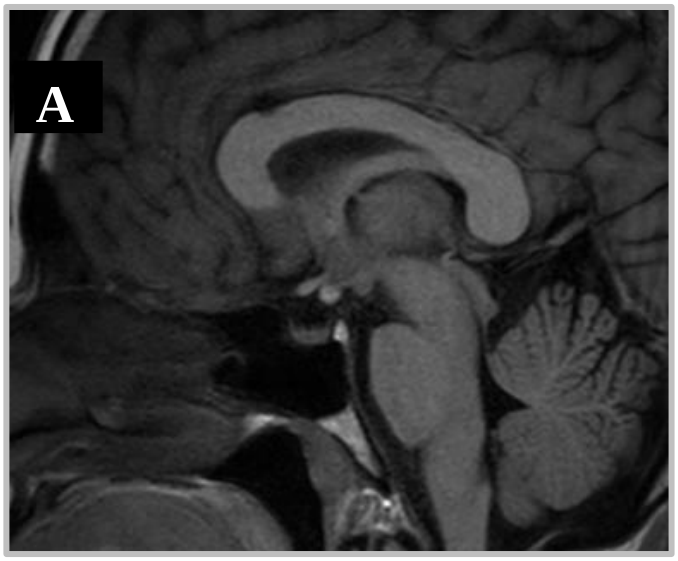


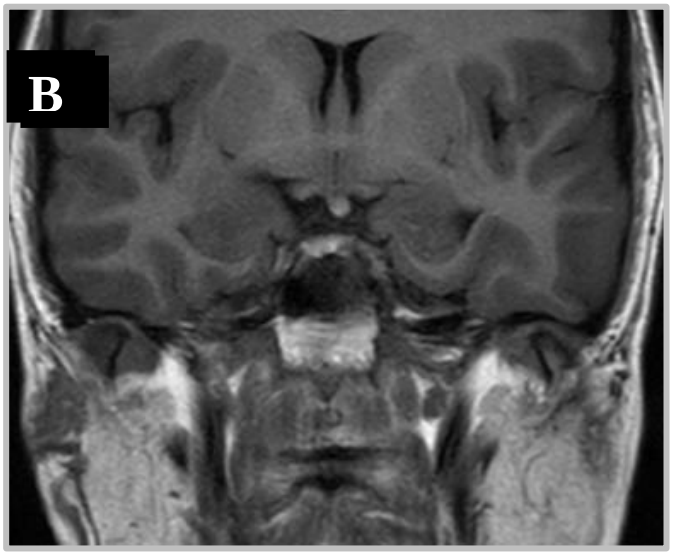
FIG 1: A and B showing rim enhancing sellar and suprasellar lesion involving the hypothalamus, mammillary body, pituitary stalk posterior pituitary gland in sagittal and coronal sections respectively on T1 post contrast images; C loss of posterior pituitary bright spot; D central restriction diffusion.

- **Case 2: Pituitary stalk interruption syndrome.**

  A 30 year-old male patient presented with panhypopituitarism. Past medical and family history was unremarkable. MRI showed the anterior pituitary lobe is small in size (height measures 3.2 mm) with normal post-contrast enhancement. Absent posterior pituitary bright spot noted in the sella turcica. T1 bright spot measuring 5.5 x 4.5 mm is noted in the median eminence posterior to the optic chiasma – Ectopic posterior pituitary. Non-visualization of pituitary stalk noted (Fig.2).The patient was managed conservatively with hormone replacement.

  The ectopic posterior pituitary is a rare condition which is characterized by the ectopic location of posterior lobe of pituitary, pituitary stalk abnormalities and associated clinical manifestations of anterior lobe related growth hormone dysfunction or less commonly multiple anterior pituitary dysfunctions. Breech deliveries, neonatal hypoxia, hypoglycaemia and jaundice are important predisposing factors[5]. Pituitary stalk abnormalities are more common in male child with multiple hormone deficiencies. MR imaging abnormality reflects the severity of hormone deficiency. It is crucial to look for associated neuronal migration disorders and septal anomalies[1]**.** Biochemical and imaging correlations are essential in diagnosis and treatment.





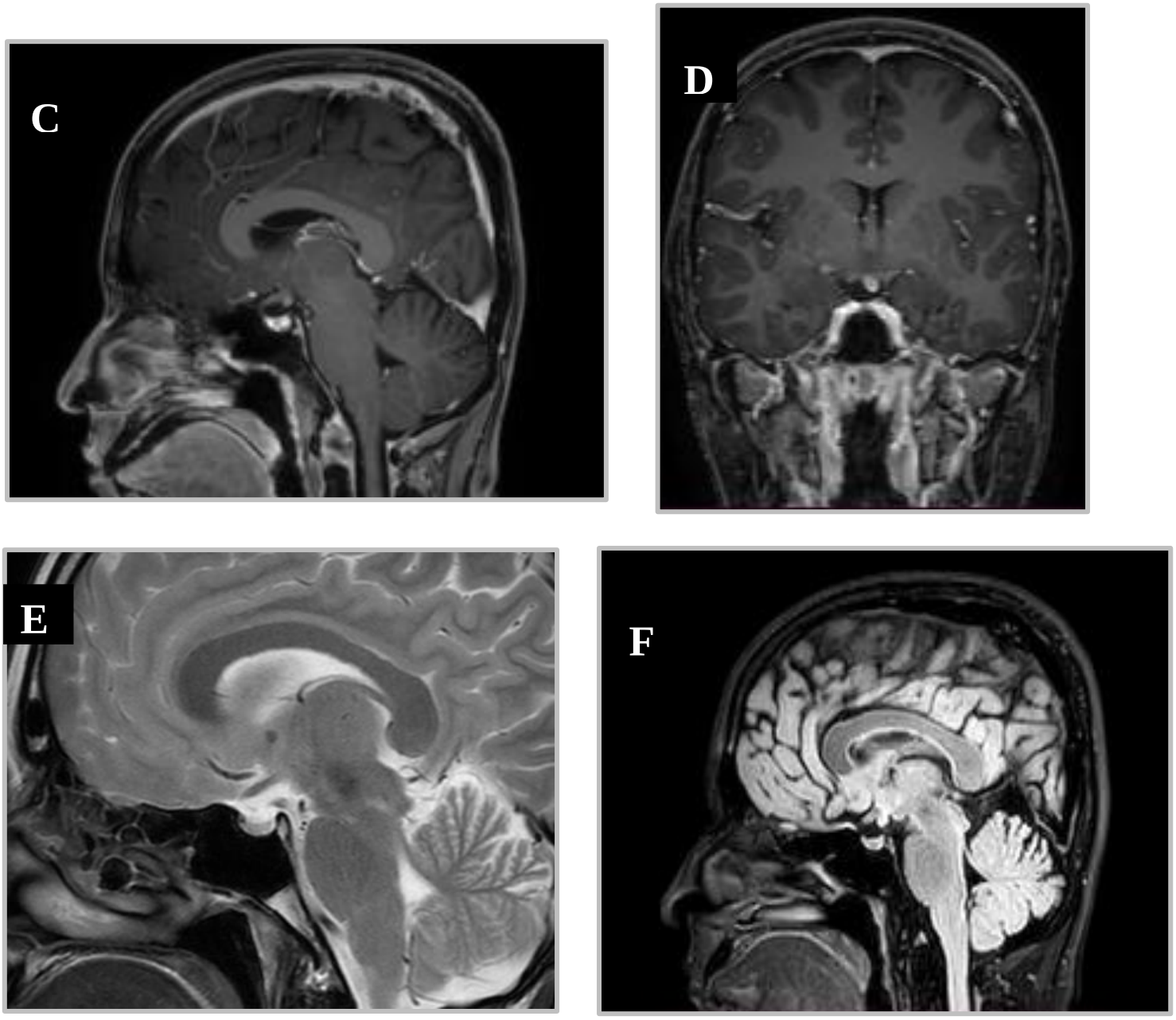


FIG 2: A and B- T1 pre contrast images, C and D -T1 post contrast images in saggital and coronal planes respectively showing small anterior pituitary lobe with normal post-contrast enhancement. Absent posterior pituitary bright spot noted in the Sella turcica. T1 bright is noted in the median eminence posterior to the optic chiasma – Ectopic posterior pituitary. Non-visualization of pituitary stalk noted; E and F -T2 and 3D FLAIR images showing the same findings.

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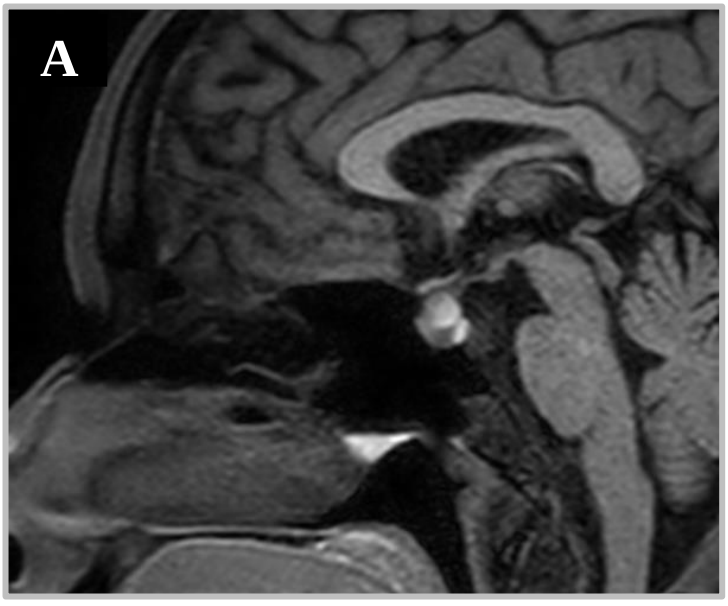
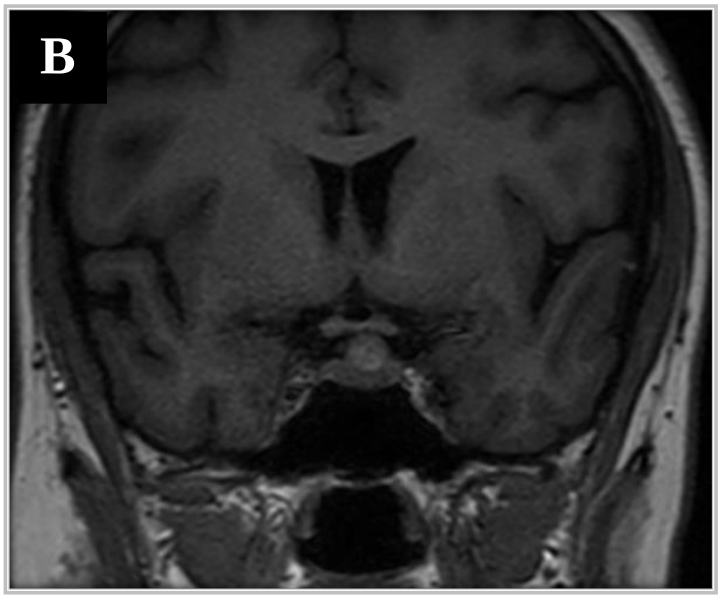
- **Case 3 : Rathke's cleft cyst**

  A 31 year-old Female patient presented with headache. Past medical and family history was unremarkable. ON MRI Pituitary gland: Shows a well-defined T1/T2/FLAIR hyperintense cystic lesion measuring 6.5 x 6.7 x 7.0mm (AP x TR x CC) noted in the pituitary fossa. On post contrast images, no enhancement noted in intra-cystic content. Enhancing normal pituitary gland is noted surrounding the cystic lesion. Pituitary bright spot is noted. (Fig. 3). The patient was managed conservatively.

  Rathke's cleft cyst (RCC) is a benign epithelial cyst believed to originate from the remnants of the Rathke's pouch. Typical imaging findings include a non-enhancing, noncalcified, intrasellar/suprasellar cyst with an intracystic nodule. Depending on its cystic content and the presence of an associated intracystic nodule, an RCC may show various signal intensities on both T1- and T2-weighted images. More specifically, T1 hyperintensity and T2 hypointensity of an RCC associated with a high intracystic protein[6]. It's essential to differentiate cystic pituitary adenoma from an RCC preoperatively, since treatment differs for both. Presence of posterior pituitary bright spot, intracystic nodule and an enhancing rim (Claw sign) of compressed pituitary gland surrounding non enhancing cyst[1].





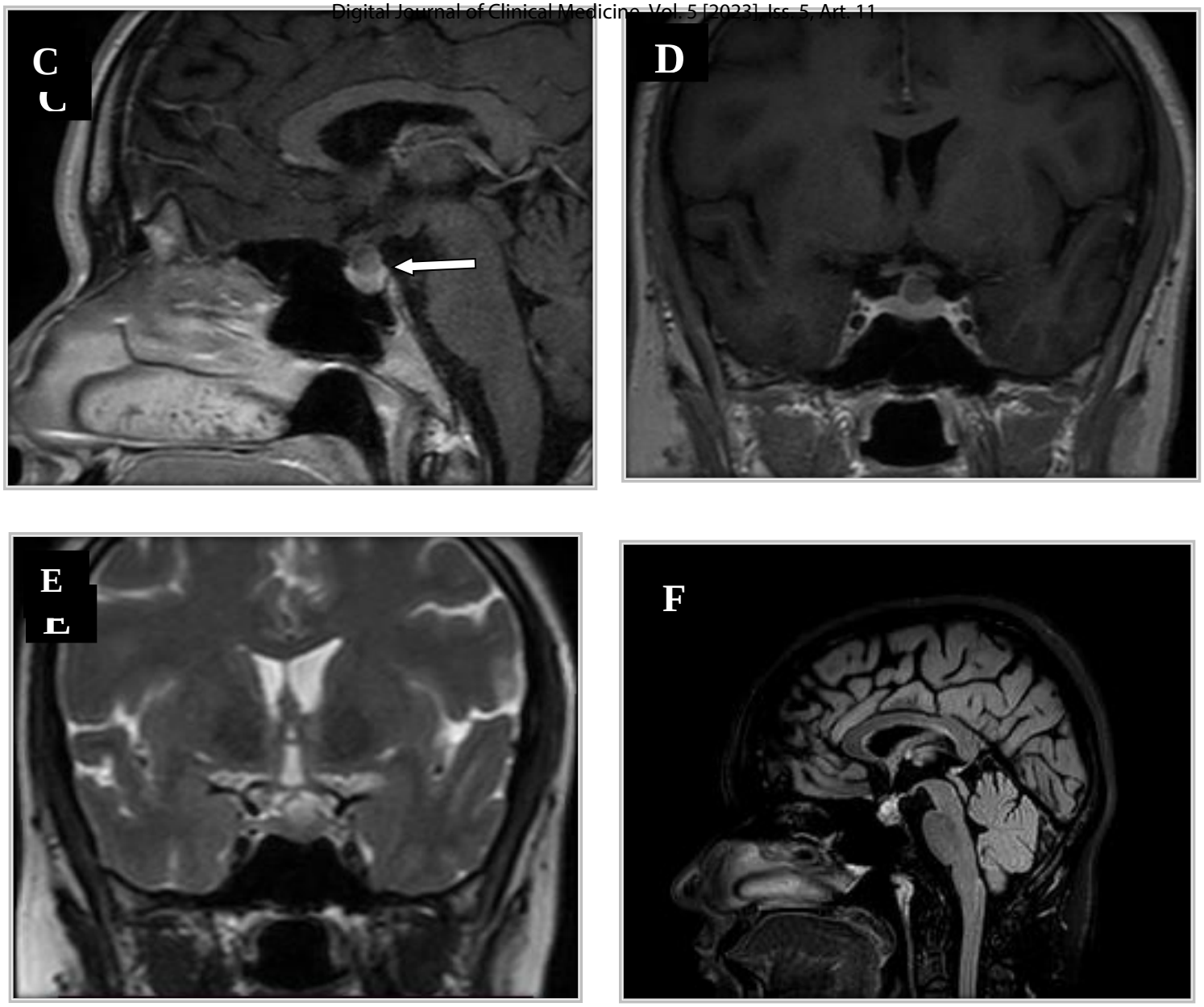


FIG 3: A and B- T1 IR pre contrast images, C and D -T1IR post contrast images in sagittal and coronal planes respectively showing a well-defined T1/T2/FLAIR hyperintense cystic lesion in the pituitary fossa. On post contrast images, no enhancement noted in intra-cystic content. Enhancing normal pituitary gland is noted surrounding the cystic lesion. Pituitary bright spot is noted; E and F - T2 and 3D FLAIR images showing the same findings.

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- **Case 3 : Tolsa-hunt syndrome with pituitary hypophysitis.**

  A 62 year-old female patient presented with right 3rd and 6th nerve palsy. On CEMRI:Soft tissue density measuring 13x7mm noted at the optic strut extending upto the cavernous sinus posteriorly with significant post contrast enhancement. The lesion is seen causing mild mass effect on the right lateral rectus muscle and optic nerve. However, no e/o signal changes in the optic nerve. The pituitary gland is mildly bulky in size (pituitary gland height is 9.6 mm) and shows homogenous enhancement with enhancing infundibular thickening (3.7mm). Para sellar T2 hypointensity noted. Adjacent dural enhancement noted and absent pituitary bright spot noted. It was diagnosed as right orbital apex syndrome with pituitary hypophysitis. Patient was treated conservatively and improved symptomatically.

  Tolosa-Hunt syndrome is a rare cause of ophthalmoplegia due to a chronic non-specific inflammation that involves the cavernous sinus and/or superior orbital fissure. Pituitary gland is rarely involved in this syndrome. Currently, the diagnosis is based on typical clinical and radiological (MRI) features; thus, a neurosurgical intervention and biopsy of lesions in a problematic region can be avoid. Tolsa Hunt is a very rare cause of hypophysitis and panhypopituitarism. It should be considered in the differential diagnosis of a sellar mass[7].

  It is essential to differentiate pituitary macroadenoma from pituitary hypophysitis. Differentiating points include loss of posterior pituitary T1-weighted bright spot, enlarged pituitary stalk , homogeneous contrast enhancement and meningeal enhancement and the parasellar T2 dark sign were typical MR imaging findings of hypophysitis. In pituitary macroadenoma posterior pituitary bright spot will not be lost. These findings were seen in the case[8].

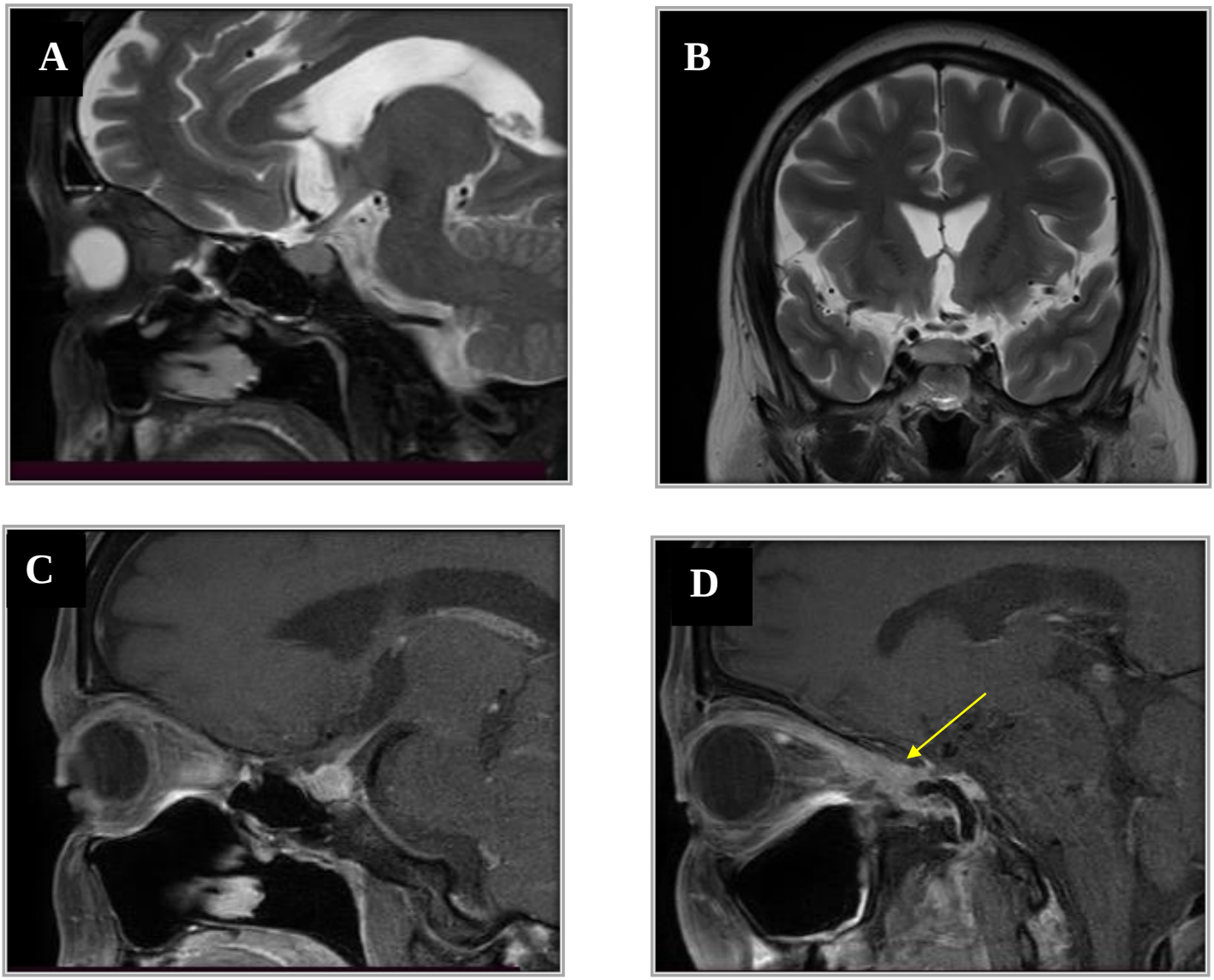

FIG 4: A and B- T2 in sagittal and coronal planes respectively showing a bulky pituitary gland; C T1 post contrast image in sagittal plane showing homogenous enhancement noted with absent pituitary bright spot noted, Adjacent dural enhancement noted; D T1 post contrast image in sagittal plane showing Soft tissue density noted at the optic strut extending upto the cavernous sinus posteriorly with significant post contrast enhancement. The lesion is seen causing mild mass effect on the right lateral rectus muscle and optic nerve.

Conclusions:

CEMR Imaging is crucial in the diagnosis of pituitary-region pathologies. Imaging findings, disease location, the lesion's relationship with the adjacent structures, the nature of the disease, clinical features and hormone deficiency must be considered for accurate diagnosis. Definitive diagnosis Helps in planning the treatment and avoids unnecessary neurosurgical intervention and biopsy of lesions in a sellar region.

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List of abbreviations:
CEMRI – Contrast Enhanced Magnetic Resonance Imaging
FLAIR – Fluid Attenuated Inversion Recovery
RCC - Rathke cleft cyst
ATT - Anti-tubercular treatment

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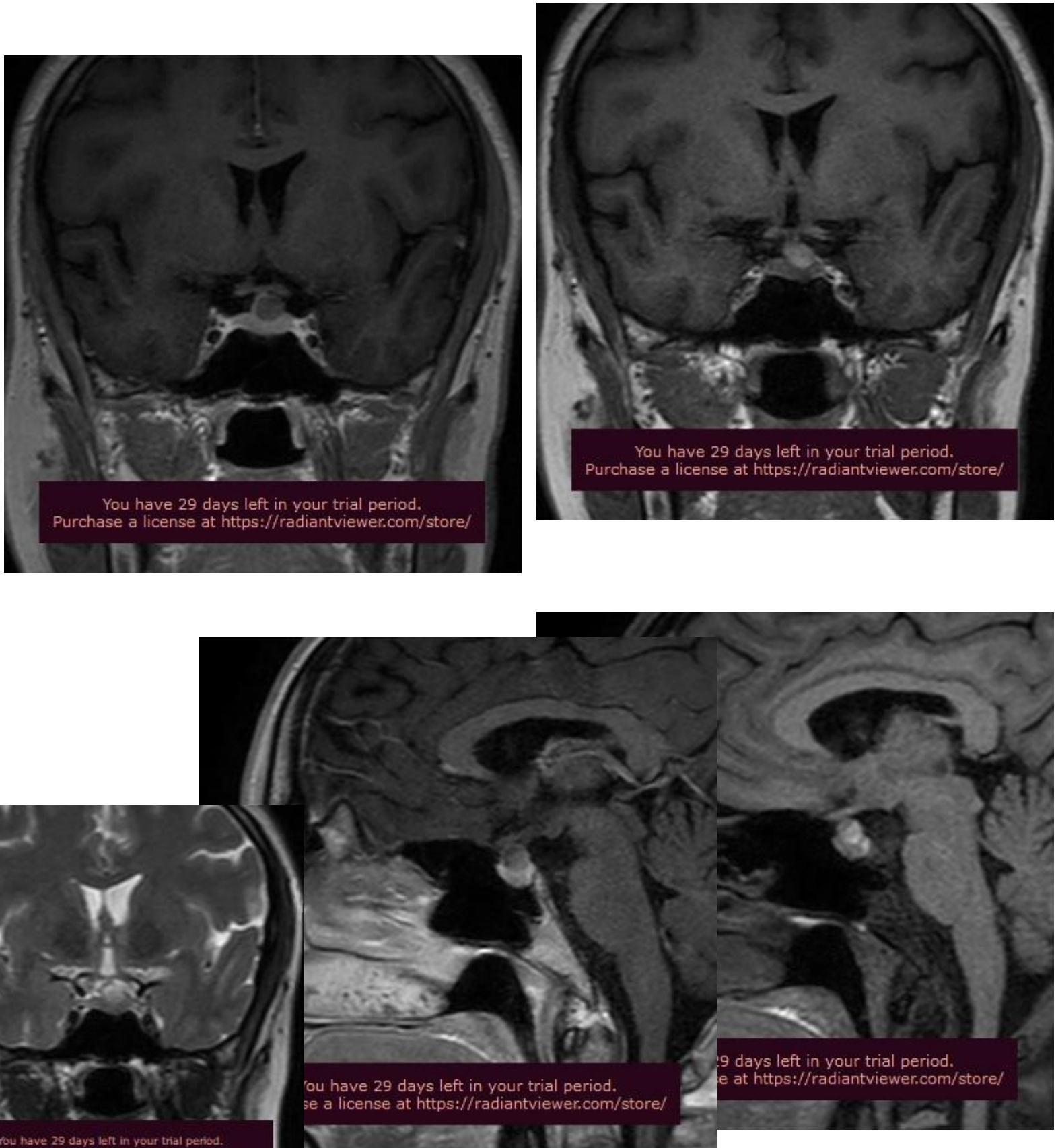

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