Case Report

Sellar and Supra-Sellar Mass Lesion Imaging Consistent Pituitary Macroadenoma In 70 Year Old Woman: A Case Report

Abstract :

Background: In the sellar region, pituitary tumors are frequent. Clinically evident pituitary lesions account for around 10% of all intracranial lesions, whereas incidental pituitary tumors are found in about 11% of people. Benign adenomas are the most common kind of pituitary tumor. These adenomas are generally tiny when they appear first and manifest early as a hormonal imbalance occurs due to overproduction. A commonly used treatment for adenomas is the excision of the tumor. If metastasis occurs, chemotherapy/radiotherapy can be used. The most common complication of pituitary adenoma is transient or permanent diabetes insipid us, CSF rhinorrhea, or visual field defects.

Case presentation: We herein present an interesting case of a 70-year-old female patient of the department of neurosurgery. A patient came on an outpatient basis with a clinical history of severe headache in the last 15 days, blurring of vision in bilateral eyes, diplopia and fainting in the previous 8-10 days, fever (on and off) in the past 8 days. The diagnosis was done with the help of CT and MRI scan imaging and treated with excision of adenoma. Many malignancies can be prevented by making specific lifestyle modifications (such as staying at a healthy weight or quitting smoking). However, no known outside risk factors have been associated with pituitary tumors. As a result, at this moment, there is no known strategy to avoid these adenomas other than early intervention.

Conclusion: a case of sellar and supra-sellar mass lesion-imaging consistent with pituitary macroadenoma in 70-year-old women managed with a multicentric approach. Genetic counseling and psychological assistance should be provided to the members of the family. The presenting with pituitary adenoma is part of a genetic condition. With further information on adenohypophyseal cytodifferentiation pathways, the classification of these cancer is expected to improve in the future.

Keyword: Hemianopia, pituitary adenoma, macroadenoma, lesion, visual acuity.

INTRODUCTION:

A pituitary tumor is a most common intracranial lesion in the pituitary gland, which is closely situated to the brain and can alter hormone levels in the body. Pituitary adenomas are aberrant growths in the pituitary gland. Certain pituitary tumors result in an overabundance of hormones that control essential body functions, and few Pituitary tumors may cause the pituitary gland to produced less hormones. Pituitary tumors are mostly benign (non-cancerous) growths (adenomas). Adenomas are benign tumors that remain in the pituitary gland or adjacent tissues and do not spread to other body regions. Symptoms of a local mass impact on neighboring structures are common in patients (especially optic chiasm). Hypopituitarism (from compression) or secretory symptoms may develop in some people due to hormone imbalance. Tumors are generally tiny when they appear first and manifest early as a hormonal imbalance occurs due to overproduction **[1,2].** Magnetic resonance imaging demonstrated and depicted intercavernous internal carotid artery encasement well, but it did not reveal displacement or obliteration of intercavernous cranial nerves as well as computed tomography. But sometimes CT is the most useful and play a vital role in technique for the evaluation and follow-up **[2].**

Therefore, the ability to see cavernous sinus invasion before surgery can help the endocrinologist and neurosurgeon design the best medicinal and surgical treatment. The goal of this investigation was to determine. The indications of cavernous sinus invasion using computed tomographic and advanced imaging technique of Magnetic Resonance Imaging [MRI]. The extent of invasion was also linked to tumor histology and hormone levels. **[2]**
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CASE PRESENTATION:

A 70 year old female patient presented to the department of neurosurgery. The patient has come with OPD basis with the clinical complaints of a severe headache last 15 days, blurring of vision in bilateral eyes, diplopia and fainting in the last 8-10 days, fever (on & off) in the past 8 days. The patient has a history of asthma 4-5 years back. She did not suffer any symptoms before this. She has not any history of hypertension, tuberculosis, diabetes mellites, etc. The weight was 71 kg. The height was 155 cm, and BMI was 29.96 kg per square meter. Any significant history of malignancy was not observed. The vital signs monitored were within normal limits. The results of the general checkup were normal. There was no evidence of thyroid hypertrophy. The results of the systemic evaluation were average. The visual acuity was found to be impaired after an ocular checkup. Extraocular motions covered the whole range of motion. The fundus examination came back normal. There was no discernible bulk or bruit in orbit. A commutated CT scan identified an "extra-axial isodense mass lesion in the suprasellar area" throughout the examination. On post-contrast images, it shows homogeneous enhancement. The mass lesion extends up to clivus identity pituitary region". MRI showed "sellar and supra-sellar mass lesion-imaging consistent with pituitary macroadenoma." Hormonal assay was carried out prolactin (PRL) level was found to be 22.8 ng/ml (normal range: female->25 ng/ml), LH- 1.34, cortisol-7.01, T3-0.839, T4-11.9, testosterone-13.3, TSH-1.59, etc. A clinical diagnosis of pituitary macroadenoma was made based on clinical examination and studies. The tumor was surgically removed and sent to a pathologist for histological analysis.

CLINICAL FINDINGS:

The CT BRAIN (P+C) scan reveals,

Evidence of extra-axial isodense mass lesion of size 42 X 21 X 25mm seen in the suprasellar region. On post-contrast images, it shows homogeneous enhancement. The mass lesions extend up to the clivus indenting pituitary region. The ventricular system appears prominent. Hypodensities are seen in a bilateral periventricular and deep white matter, likely representing small vessels ischemic lesions, periventricular ooze (periventricular lucency). The rest of the brain parenchyma appears normal in attenuation. Cisterns and sulci appear prominent. No intro/extracranial hemorrhage is seen. No significant midline shift is noted. Both CP (cerebellopontine) angle regions appear unremarkable. Visualized bones appear normal.

CT study of the brain shows an Extra axial isodense mass lesion in the suprasellar region. On post-contrast images, it shows homogeneous enhancement. The mass lesion extends up to the clivus identity pituitary region.

As detailed evaluation is not seen in the CT (P+C) study, MRI (P+C) was suggested.

MRI BRAIN with CONTRAST reveals,

Figure (1) and (2) show, the is e/o homogeneously enhancing extra-axial altered signal intensity mass lesion noted in the sellar and suprasellar region (Snow mass appearance) measuring approximately 40 X 25 X 22 mm (CCxAPxTrans) appearing heterogeneously hyperintense on T2WI/FLAIR, isointense on T1WI with few areas showing blooming on GRE and no restriction on DWI. It is indenting over the optic chiasma. Mild laterally displacing adjacent bilateral carotid vessels (however, carotids show standard flow void signals).

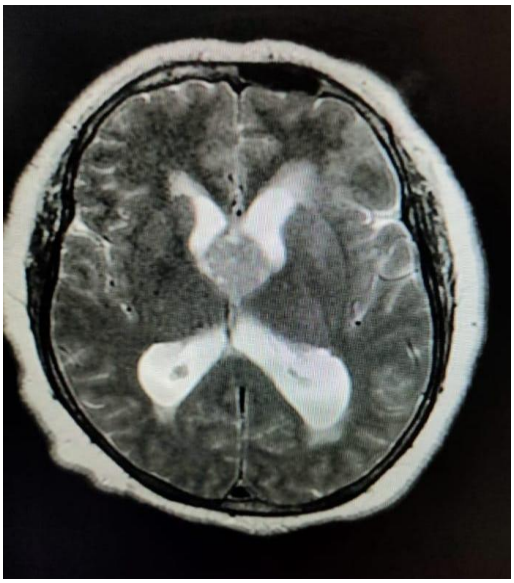

Fig: 1 MRI BRAIN T2 WI AXIAL IMG

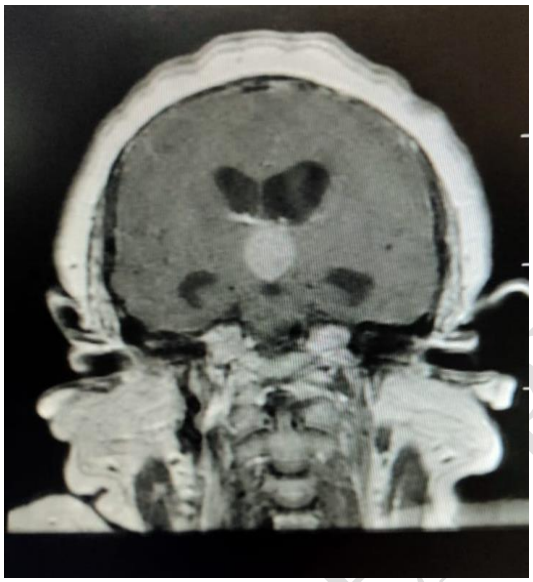

Fig:2 MRI BRAIN T1 WI CORONAL IMAGE

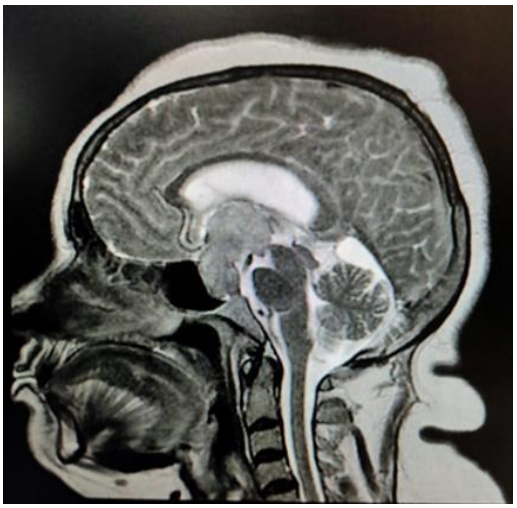

Fig. 3: MRI BRAIN T2 WI SAGGITAL IMG.

It is showing **figure no. 3** The displacing and compressing of the 3rd ventricle resulting in supratentorial mild hydrocephalus. The lesion is causing widening of sella and scalloping of its walls. Bilateral cavernous sinus appears normal in bulky, shows regular signal intensity/enhancement. Both gangliocapsular regions appear normal.The midline structures are typically oriented. In the infratentorial, the brainstem, the cerebellum, and the basal cisterns appear normal. Visualized portions of the paranasal sinuses and orbit are normal.

IMPRESSION MRI BRAIN WITH CONTRAST REVEALS Sellar and supra-sellar mass lesion-imaging consistent with pituitary macroadenoma.

DIAGNOSTIC EVALUATION:

Aspects of radiography

Pituitary macroadenomas are masses with a diameter greater than 10 mm that arise from the pituitary gland and often extend superiorly into the suprasellar cistern, compressing the chiasm. As the tumor advances superiorly, the diaphragm sellae indentures on both sides, forming a snowman or figure-eight shape.The pituitary fossa is nearly always more giant with thinner rebuilt bone since these tumors are generally slow-growing **[3,4]**

Computed Tomography

The amount of non-contrast attenuation varies depending on the presence of hemorrhagic, cystic, and necrotic components. Solid adenomas without bleeding exhibit attenuation equivalent to that of the brain (30-40 HU) and moderate contrast enhancement, which is less pronounced than meningiomas. The occurrence of calcification is uncommon. **[5]**

Magnetic Resonance Imaging

The recommended imaging modality is MRI. It can view the optic chiasm, anterior cerebral arteries, and cavernous sinuses and identify the tumor. Depending on tumor elements such as bleeding, cystic transformation, or necrosis, overall signal qualities might vary substantially.

- **T1**
  - Grey matter is often isointense
  - Due to regions of greater cystic change/necrosis/haemorrhage, lesions are typically heterogeneous and fluctuate in signal.
- T1 Contrast (Gd)
  - components that are solid show a bright to moderate improvement
- T2
  - Isointense to grey matter in most cases
  - Due to regions of cystic change/necrosis/haemorrhage, major lesions are typically heterogeneous and fluctuate in signal
- GRE/SWI
  - Any hemorrhagic components, which manifest as signal loss regions are most difficult to identify
  - Although calcification is uncommon, it should be ruled out by analyzing CT scans.

Preoperatively, attempting to forecast invasion based on scans is essential. The greater the chance of invasion, the more a tumor spreads into the cavernous sinus and the more it encircles the internal carotid artery **[6]**

The most practical technique is to measure the degree of enhancement of the internal carotid artery's cavernous section. Sinus involvement is infrequent if the angle is less than 90 degrees, but it is guaranteed if it is more than 270 degrees. **[7,8]**

DISCUSSION:

Pituitary macroadenomas are the most frequent suprasellar mass in adults, and they are the most common cause of transsphenoidal hypophysectomies. *Pituitary macroadenomas* are adenomas that are larger than 10 mm in diameter and are twice as frequent as pituitary microadenomas. **[9].** They generally appear on imaging as a solid tumor with attenuation similar to the brain (30-40 HU) and mild contrast enhancement. On MRI, they are isointense to grey matter on both T1- and T2- weighted scans. However, depending on tumor components such as bleeding, cystic transformation, necrosis, and other factors, attenuation and signal characteristics might vary substantially. Apoplexy of the pituitary gland can be severe and life-threatening. In most people, a macroadenoma developing superiorly from the pituitary fossa (or other pituitary area tumors) would reach, elevate, and compress the chiasm's central portion. As the patient was admitted to the neurosurgery department of the AVBR Hospital, with chief complaints as mentioned previously; routine investigations like assessment, CBC (complete blood count), LFT, KFT, blood group analysis, hormonal tests such as LH, cortisol, prolactin, T3, T4, testosterone, TSH with virology investigations were performed. The diagnostic evaluation was performed with CT BRAIN Scan (P+C), MRI brain with contrast pre-operatively, and post-surgical CT BRAIN PLAIN. Excision of pituitary macroadenoma procedure was planned and performed for the removal of adenoma. After the operative procedure Inj. Amikacin 750mg IV OD, Inj. Pantoprazole 40mg IV OD, Inj. Emset 4mg IV TDS, Inj. Neomol 100ml IV TDS, Inj. Pause 500mg IV BD, Inj. Levepril 500mg IV TDS, Inj. Hydrocortisone 100mg IV TDS, Inj. Ceftriaxone 1gm IV BD was administered.

A plain CT scan of the brain was performed postoperatively. The postoperative case of pituitary macroadenoma revealed; Postoperative clavarial defect noted in the left high parietal bone and right frontal bone with adjacent extra-axial focal air collection with overlying soft tissue swelling surgical clips in situ. A well-defined blood density (+50 to +80 HU) collection was noted in the suprasellar and sellar region, measuring 23x20x30mm. Blood density collection was noted in occipital horns of bilateral lateral ventricle and 4th ventricle. Minimal blood density collection in bilateral Sylvian. Fissure, basal cisterns, falx, and tentorium cerebelli s/o minimal subarachnoid hemorrhage and subdural hemorrhage. Bilateral diffused cerebral edema with effacement of sulcogyral spaces. The bilateral gangliocapsular region appears normal. Cerebellum, brainstem, cisternal spaces, and posterior fossa structures appear normal. Visualized orbit appears normal. Mucosal thickening noted right maxillary sinus and left sphenoid sinus s/o sinusitis. The patient's prognosis was good with enhancing recovery.

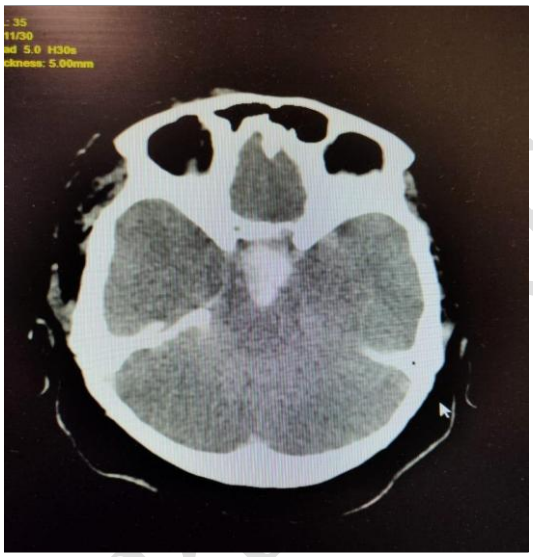

Fig:4 CT SCAN BRAIN PLAIN (POST-OPERATIVE)

The majority of pituitary adenoma formation requires a variety of oncogenes and tumor suppressor genes, including cyclinD1, multiple endocrine neoplasia type 1 (MEN1), RAS, p53, and the retinoblastoma gene. The most significant gene linked with sporadic carcinogenesis is Gsp, which encodes the gs-alpha subunit, a stimulatory guanine binding protein that regulates hypothalamic GH releasing hormone activities in somatotrophs. Gsp mutations are most strongly associated with somatotropinomas, with Gsp mutations in 40% of these tumors. FIPA and McCune-Albright syndrome accounts for 4-5 % of all pituitary adenomas (FIPA). **[10,11].** A number of related articles were reviewed[12-13].

CONCLUSION:

A sellar and supra-sellar mass lesion-imaging case consistent with pituitary macroadenoma in 70-year-old women that had been managed with a multicentric approach. Genetic counseling and psychological assistance should be provided to the members of the family. The presenting with pituitary adenoma is part of a genetic condition. With further information on adenohypophyseal cytodifferentiation pathways, the classification of these cancers is expected to improve in the future. In the young age group, any case of such complaints must be thoroughly assessed with the high skepticism index for benign/malignant lesions to prevent delayed diagnosis and diagnostic errors.

ETHICAL APPROVAL: Not applicable.

CONSENT: Patient's informed consent was obtained when drafting a case report and for publishing.

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