

# Invasive Pituitary Macroadenoma: A Rare Case Report

Shruti Patil<sup>1</sup>, Tanvi Choubey Dixit<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Radiodiagnosis, Mahadevappa Rampure Medical College Basheshwar Hospital, Gulbarga, Karnataka, India,

<sup>2</sup>Post Graduate Student, Department of Radiodiagnosis, Mahadevappa Rampure Medical College Basheshwar Hospital Gulbarga, Karnataka, India

## Abstract

Pituitary adenomas constitute approximately 10% of all intracranial tumors Pituitary adenomas are the most common tumors of the seller region. They show slow but severe impact on vision due to compression of the optic nerves, optic chiasm, and cavernous sinus. We are presenting this case report of 47-year-old patient with chief complaints of headache for 3 months and disorientation. Patient was subjected to computed tomography brain – plain + contrast and magnetic resonance imaging-T1 T2 fluid-attenuated inversion recovery and diffusion sequences. The report highlights the extension of mass into suprasellar region postero-inferiorly into clivus with compression of optic chiasma and encasement of cavernous sinus bilaterally suggestive of the invasive nature of macro adenoma.

**Keywords:** Clivus erosion, Invasive, Macroadenoma

## INTRODUCTION

Pituitary adenomas are the most common tumors of the seller region. They constitute approximately 10% of all intracranial tumors. They tend to have slow but severe impact on vision due to compression of the optic nerves, optic chiasm and cavernous sinus. Grossly, depending on the size they are classified as microadenomas if their diameter is <10 mm or as macro adenomas if it is >1 cm.<sup>1</sup>

Tumor is called invasive when it extends into the suprasellar cistern, not by invading but simply by stretching and fenestrating the diaphragma sellae, and arachnoids layer that separates the cerebrospinal fluid-containing subarachnoid space above from the intrasellar space below.

In some patients, a dumbbell-like extension of a pituitary tumor reaches through the small opening in the diaphragm traversed by the pituitary stalk.<sup>2</sup>

The few reports published to date have not reported series of sufficient size to establish the characteristic clinical, pathologic, and imaging attributes of clival invasion by pituitary adenoma.<sup>3</sup> Pituitary adenomas are almost always benign with no malignant potential.

In general, pituitary lesions can be subdivided into nonsecretory and secretory tumors of the pituitary gland, other intrasellar tumors, and parasellar tumors.

Nonsecretory tumors occur in and around the sellae turcica and can mimic the pituitary tumors clinically.

## CASE REPORT

A 47-year-old male presented with headache of gradual onset slowly progressive increasing in severity since 3 months with recent onset of disorientation of sudden onset. On advice, patient was evaluated using plain and contrast computed tomography brain and magnetic resonance imaging (MRI).

### CT Brain Plain

Well defined lobulated mixed density mass lesion (Figures 1-3) approximately having measure 5 cm × 4 cm × 4.7 cm. Noted arising from sella and invading into suprasellar region bone window shows widening/

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### Corresponding Author:

Dr. Tanvi Choubey Dixit, Post Graduate Girls Hostel, Basheshwar Hospital, Sedum Road, Gulbarga, Karnataka, India.

Phone: +91-9986021712. E-mail: [kanuchoubey@gmail.com](mailto:kanuchoubey@gmail.com)

ballooning of sella (Figures 4 and 5) with clivus erosion. Mass lesion appears to compress optic chiasma and displaces suprasellar cisterns anteriorly. Mass seems to invade the optic chiasma anteriorly.

**MRI Brain with Contrast**

Non homogenous heterogeneous mass lesion measuring: 5 cm × 4 cm × 4.7 cm with few cystic areas, noted arising from sella with extension into suprasellar region mass seems to compress optic chiasma anteriorly and extend posteroinferiorly into clivus (Figures 6-8). Lesion causes diffuse ballooning of sella tursica with a classical figure of 8 appearance superiorly into supresellar cistern.

Clivus involvement is evident by loss of normal T1 hyperintense signal of fatty marrow which appears to be replaced with hypointense signal.

Post contrast study shows intense heterogenous enhancement of the mass lesion with few non-enhancing cystic areas (Figures 4, 8, 9).

Mass lesion seen to encase both intracavernous internal carotid arteries left cavernous sinus more than right.

Lesion appears hyperintense on T2W and few areas of blooming s/o calcification.

**Histopathology**

H and E stained multiple sections show diffuse shunts and few nests of monomorphic cells obliterating the normal architecture.

Cells are oval to polygonal with fairly large amount of eosinophilic cytoplasm and normal central nuclei with fine chromatin and inconspicuous nucleoli separated by thin fibrovascular connective tissue.

No e/o mitosis or hemorrhage noted.

Reticulin stain showed absence of normal nested architectural pattern of pituitary adenohypophysis. Features suggestive of invasive pituitary macroadenoma.

**DISCUSSION**

Truly aggressive pituitary tumors are uncommon, with the incidence of not more than 2%. Such tumors prove their atypical behavior by invading adjacent tissues, by proliferating rapidly.

Nonsecretory pituitary tumors are called null-cell tumors measuring a few millimeters are common and found in up to 25% of autopsies. These may grow slowly, destroying

normal pituitary function (hypopituitarism), or they may compress nearby structures and cause neurologic problems.<sup>4</sup>



Figure 1: NECT (sagittal view) Bone window demonstrating sellar widening with clivus destruction



Figure 2: NECT axial section brain showing invasive mass in suprasellar region

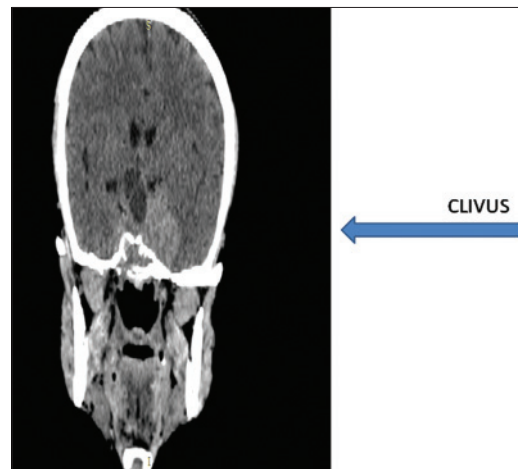


Figure 3: NECT coronal view demonstrating clivus erosion

MRI has proven to be the best imaging modality in the evaluation of pituitary tumors. Contrast MRI using gadolinium played an important role in diagnosis. Its role in detection and characterization of micro and macro adenoma has been well described.<sup>5</sup>

Dynamic Imaging is technically has emerged for the evaluation of pituitary adenomas, particularly inaccurate delineation of those microadenomas with no contour abnormality and in differentiating residual/recurrent adenoma from surrounding post-operative tissue. It is

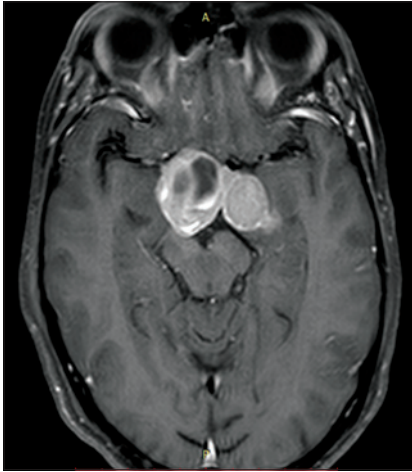


Figure 4: MRI axial view

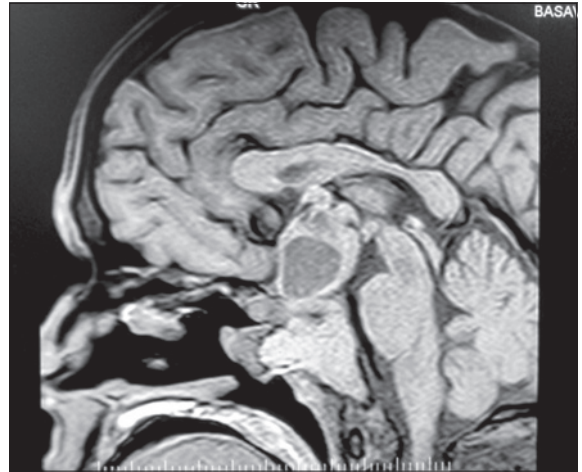


Figure 7: MRI 3 mm thin section sagittal view demonstrating cystic areas within the mass

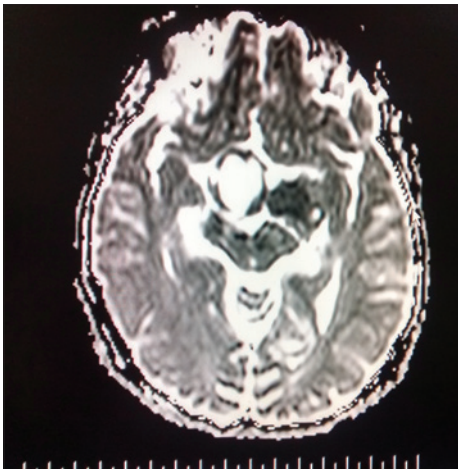


Figure 5: Diffusion weighted MRI images



Figure 8: MRI coronal view demonstrating entention of mass lesion

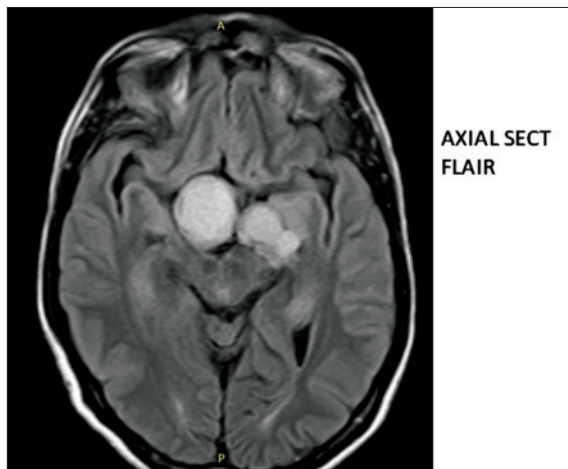


Figure 6: Axial fluid attenuated inversion recovery sequence

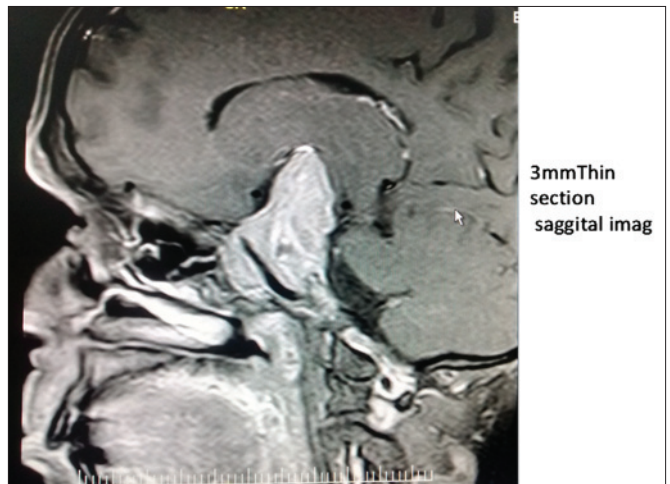


Figure 9: 3 mm thin section sagittal image

useful in the evaluation of pituitary microadenomas as well as assessment of macro adenoma.

The use of intraoperative MRI (IMRI) and intraoperative real-time ultrasonography during endoscopic pituitary surgery is the most recent advancement in pituitary imaging.

IMRI provides better visualization of intra- and parasellar anatomy facilitating complete resection of the tumor.

In the near future, the use of plasma screen has a promising role as it can provide a sufficient high-quality image to demonstrate the nerve compression and the residual tumor.

The use of intraoperative real-time ultrasonography has proven to be very useful in localizing the intracranial neoplasm, particularly the deep skull base lesions and facilitating their resection. It also assists in guiding needles for biopsy and aspiration of pituitary lesions.<sup>6</sup>

## CONCLUSION

The study highlights the extension of mass into suprasellar region, posteroinferiorly into clivus, with compression of

optic chiasma and encasement of cavernous sinus bilaterally suggestive of the invasive nature of macroadenoma.

The invasive nature of pituitary macroadenoma is well-documented, but while invasion of the cavernous sinuses and carotid arteries and along the dura is common, invasion of the clivus is relatively rare.

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