

# A Case of Atypical Pituitary Macro Adenoma

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## ABSTRACT

We report a case of 17 years old male with chief complaints of severe right hemi cranial headache since 3 days for which he seeks advice from local doctor, but did not get relief. Patient also has short height and markedly decreased vision since last 6 weeks. Patient under gone for MRI brain with contrast revealed a large "figure of 8" markedly enhancing sellar mass with suprasellar and right para sellar extension s/o atypical pituitary macro adenoma. Markedly raised Serum prolactin (470ng/ml) and mildly reduced FSH & LH were noted.

**KEY WORDS:** atypical pituitary macro adenoma, micro-adenomas, panhypopituitarism, pituitary apoplexy, prolactinoma

## INTRODUCTION:

The sellar region is an anatomically complex area bounded by sphenoid sinus antero-inferorly, the paired cavernous sinuses laterally, the suprasellar cistern and its contents, diaphragma sellae and hypothalamus superiorly and dorsum sella & brainstem posteriorly.<sup>[1]</sup> Pituitary tumors are common in the sellar area. The prevalence of clinically apparent pituitary lesions is estimated to comprise approximately 10% of all intracranial lesions.<sup>[2]</sup> In most cases, they represent slowly growing, clinically non functioning tumours developing from adenohypophysial cells.<sup>[3]</sup> The mean pituitary volume in the age group 11 to 20 yrs is 0.340cc<sup>3</sup> in male and 0.280cc<sup>3</sup> in females.<sup>[4]</sup> Micro -adenomas are tumors measuring less than 1 cm in diameter and those of more than 1cm are termed macro-adenomas. Diffuse adenomas lead to sellar expansion; often compressing the residual gland into a thin membrane. Massive adenomas often replace the sellar floor; displace surrounding structures and undergo suprasellar extension. Macro-adenomas compress normal pituitary and cause panhypopituitarism. Macro-adenomas often produce stalk effect, in which mild to moderate elevations of prolactin (PRL) hormone result from stalk compression caused by growing tumor

mass. This mass blocks the transport of dopamine and thus releases the anterior pituitary from the inhibitory control by the hypothalamus.

## CASE REPORT:

A 17 years old male presented to Medicine OPD with chief complaints of severe headache since 3 days for which he seeks advice from local doctor but did not get relief. Patient also has inability to gain height with increasing age since last 5 years with markedly decreased vision since last 6 weeks. Patient was referred to Department of Radio diagnosis, People's College of Medical Sciences & Research Centre, Bhopal for MRI brain in pituitary protocol to diagnose any pituitary/sellar pathology. The patient was advised for LH, FSH, Serum prolactin, serum cortisol by 8AM/ 4PM and T4/TSH.

The reports were as follows: Serum Prolactin: 470ng/ml (Ref Range 3-35 ng/ml); FSH: 0.99 mIU/ml (Ref Range 1.7-12 mIU/ml); LH: 0.60 mIU/ml ( Ref Range 1.1-7 mIU/ml); T4: 71.65 nmol/L (Ref Range 60-160 nmol/l); TSH: 0.638 mIU/ml (Hypothyroid 0.15-0.25, Euthyroid 0.25-4, Hyperthyroid >5); Serum cortisol morning: 25.3 microg/dl (Ref Range 4.3-22.4); Evening 26.11 microg/dl (Ref Range 3.03-16.66).

In MRI, there is a large well defined markedly enhancing "figure of 8" appearance soft tissue mass measures 4.3 x 2.3 x 2.1 cm ( CC x TR x AP axis ) in pituitary fossa causing widening of the sella with the suprasellar and right parasellar extension. There were few non enhancing areas within the mass with multiple small areas of blooming in GRE image suggestive of focal haemorrhages. It appears that mass is encasing internal carotid artery at

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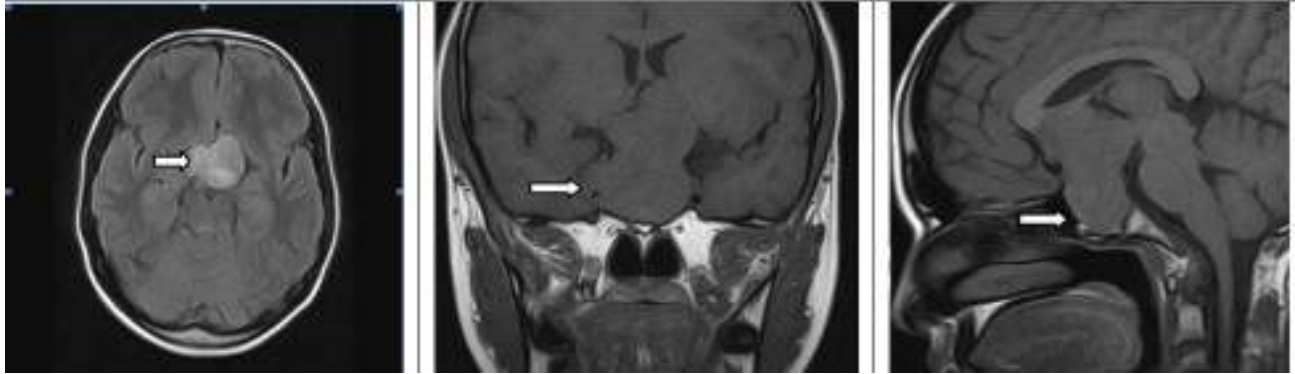
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**Figure 1:** Plain, axial, coronal and Sagittal T1 image of brain showing a large heterogeneous soft tissue mass in pituitary fossa causing widening of sella.

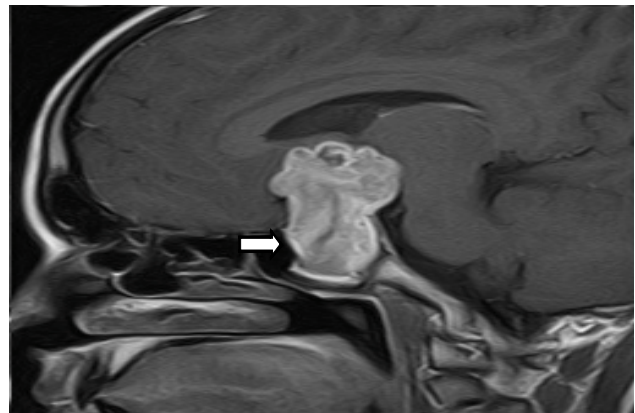
its bifurcation along with posterior communicating artery and causing invasion of right cavernous sinus.

Optic chiasm is markedly compressed and displaced postero-superiorly, predominantly left side. In superior extension, mass is extending up to 3<sup>rd</sup> ventricle with mild indentation with no evidence of hydrocephalous at the time.

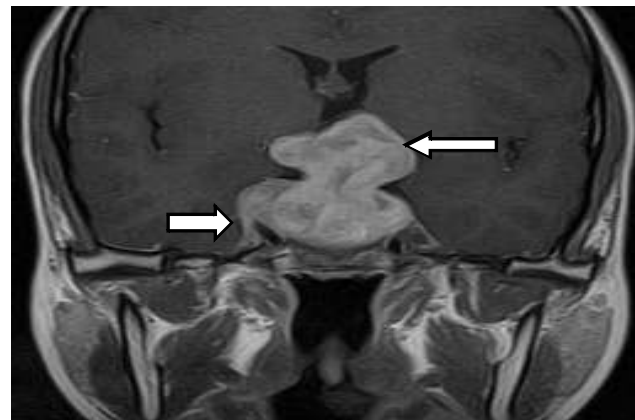
Diagnosis of atypical macro adenoma was made on the basis of morphology and change in signal pattern in MRI. Histopathological diagnosis cannot be established because no stereotactic biopsy or surgery was performed. The treatment included Tablet Cabergolin 0.25 mg oral twice a week i.e. Tuesday and Friday and advised for follow up after 3 months. After treatment in Department of Medicine of People's College of Medicine and Research Centre, the patient came for follow up MRI in Department of Radiodiagnosis.

**In follow up after 3 months:** MRI brain with contrast revealed T2/FLAIR mixed signal intensity soft tissue lesion in pituitary fossa with widening of sella. Few non enhancing necrotic areas and areas of blooming in GRE suggestive of hemorrhage noted within it. It measures 2.4 x 1.7 x 1.5 cm (CC x TR x AP axis) in size. Sagging of optic chiasm with close abutment of bilateral internal carotid artery (right > left) is noted. In comparison to previous scan of before treatment there is marked reduction in size and volume of the lesion with areas of focal necrosis and hemorrhage, significant reduction in mass effect to adjacent structures is also noted. Patient very well responded to clinical symptoms after cabergolin therapy. Visual disturbance and headache relieved completely. Hemorrhage and infarction is shown following cabergolin therapy.

**In follow up after 6 months:** The current contrast MRI reveal mild reduction in size measuring 1.0x 1.5 x 1.4cm ( CC x TR x AP ). No obvious mass effect is noted.



**Figure 2:** Post contrast T1 Sagittal image shows markedly enhancing "figure of 8" appearance soft tissue mass in pituitary fossa causing widening of the sella.



**Figure 3:** Post contrast T1 coronal image shows suprasellar and right parasellar extension.

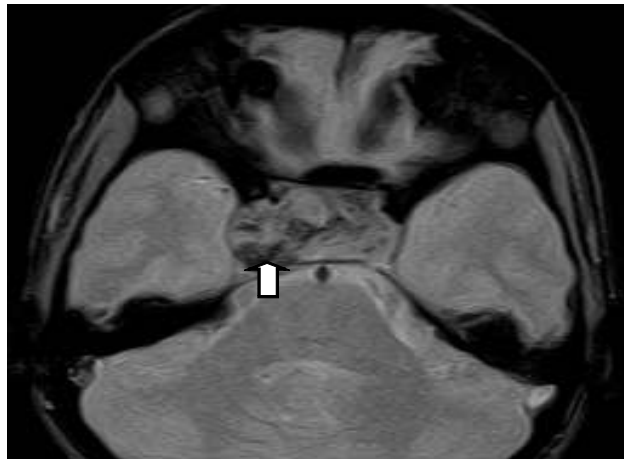
**In follow up after 9 months:** There is further mild reduction in size of residual pituitary measuring 0.8 x 1.4 x 1.2 Cm (CC x TR x AP axis), with few tiny areas of necrosis noted within it. There is also widening of sella tursica and supra sellar cisterns noted with shagging of optic chiasm. No obvious mass effect or acute hemorrhage is noted within.



**Figure 4:** Axial post contrast T1 image shows few non enhancing necrotic areas noted within the mass



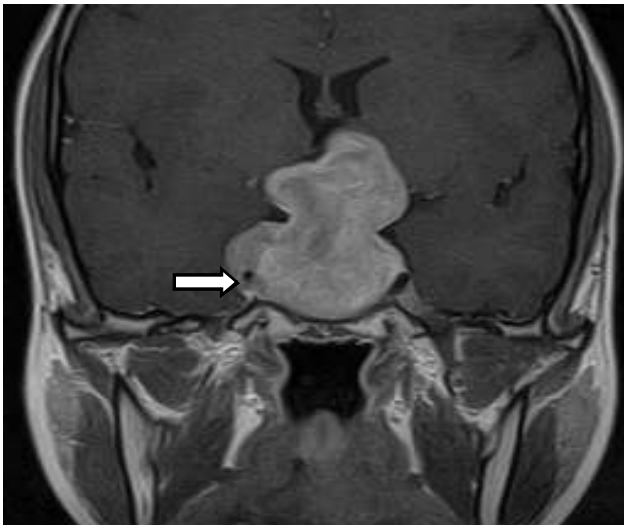
**Figure 7:** Post contrast T1 axial image shows encasement of internal carotid artery at its bifurcation with posterior communicating artery causing invasion of right cavernous sinus.



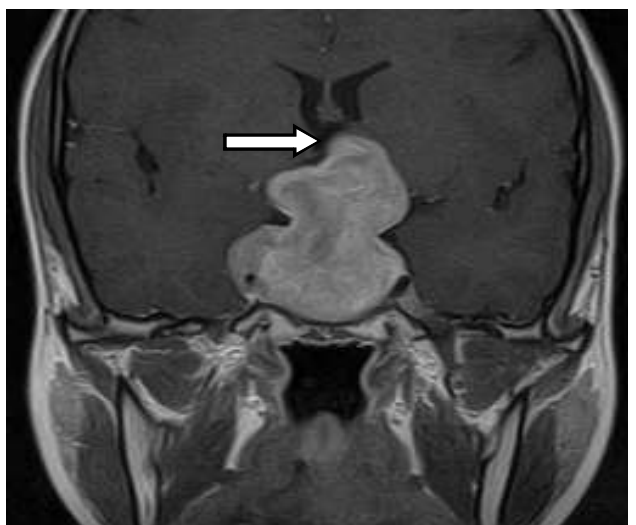
**Figure 5:** Plain Axial GRE image shows multiple small areas of blooming in GRE suggestive of focal haemorrhages.



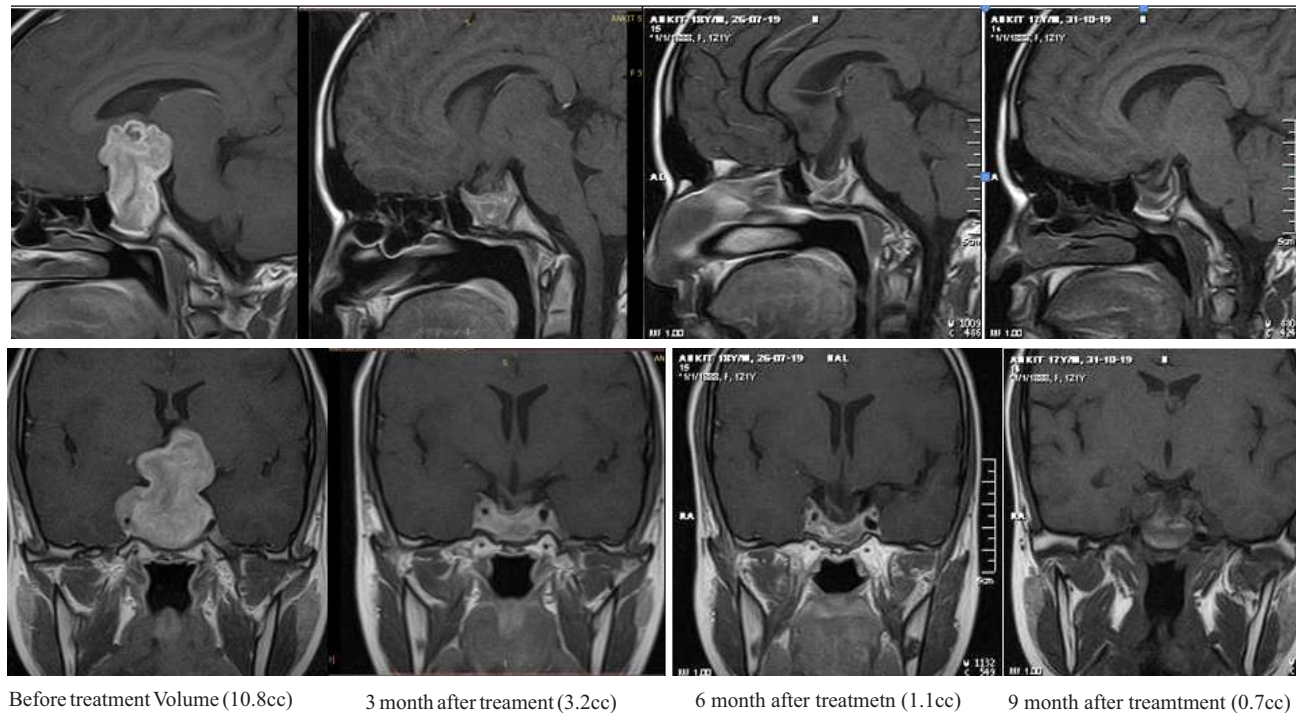
**Figure 8:** Post contrast T1 coronal image shows that Optic chiasm is markedly compressed and displaced postero-superiorly.



**Figure 6:** Post contrast T1 coronal image shows that mass is encasing internal carotid artery



**Figure 9:** Post contrast T1 coronal image shows that mass is extending up to 3<sup>rd</sup> ventricle with mild indentation.



**Figure 10:** Treatment response of Pituitary macro adenoma by post contrast MRI in sagittal plane (upper row) and coronal plane (lower row).

The volume of pituitary gland is estimated by using the formula:  $V = \text{Craniocaudal dimension} \times \text{Transverse dimension} \times \text{Antero-posterior dimension} \times 0.52$  (This factor is obtained from the sphere volume equation coefficient and cubic volume calculation:  $(4/3\pi)(r_3)/(2r)_3 = 3.1416/6 = 0.52$ ).

## DISCUSSION:

Atypical Imaging findings of pituitary adenoma show the following: (a) ectopic location: sphenoid, cavernous sinus, pituitary stalk; (b) abnormal growth / invasion: sphenoid sinus, cavernous sinus, clivus; (c) large haemorrhage, heavily calcified; and, (d) very large size: Giant pituitary adenoma (>4 cm in diameter). Typical Imaging findings of pituitary adenoma show the following: (a) sellar mass with no clear distinction from the pituitary gland; (b) "figure-of-eight" or "Snowman" appearance; (c) size is > 1 (cm); and (d) typically upward growth.

We can only refer to this tumour as an atypical pituitary adenoma, because this tumour presents with aggressive biological behaviour and atypical pattern on MRI brain imaging.

MRI scans showed that the tumour had invaded the surrounding sellar structures, including

the cavernous sinus, sphenoid sinus, encasing internal carotid artery at its bifurcation and showing markedly compressed and displaced optic chiasm postero-superiorly, & multiple small areas of blooming in GRE sequence. Early identification of aggressive endocrine tumours would allow the implementation of an intensive treatment that could prevent the recurrence or metastasis. Recurrence rates of 30% for adenomas after a trans cranial approach have been reported.<sup>[5]</sup> In 2005, Saeger et al. reported an incidence of 2.7% of atypical pituitary tumours among 451 cases from the German Pituitary Tumour Registry who underwent transphenoidal surgery.<sup>[6]</sup> Atypical pituitary adenoma are thought to be precursor lesions of pituitary carcinoma. Pituitary carcinoma is a very uncommon condition that accounts for merely 0.1% of all pituitary adenomas.

Pharmacological treatment of pituitary macro adenoma is most effective and safest therapy. Previously bromocriptine was used but now-a-days a newer D2 agonist named as cabergolin is used which is more selective for pituitary lactotrope D2 receptors and long acting ( $t^{1/2} > 60$  hours). Just two doses of cabergolin in a week give excellent result with lower incidence of nausea and vomiting. Most of the cases of macro adenoma show significant regression in size and neurological symptoms during therapy of 3

months. Serum prolactin usually returns to normal range in 2-4 weeks of cabergolin therapy.<sup>[7]</sup>

### CONCLUSION:

Abnormal growth and invasion of sphenoid sinus, cavernous sinus, clivus with Large haemorrhage and very large size (>4 cm in diameter) makes the diagnosis of atypical adenomas more reliable. MRI brain with pituitary protocol is the investigation of choice for evaluating pituitary or sellar pathology. It not only helps in the diagnostic differentiation of these lesions but also provides useful information about the anatomical relationship of the gland with adjacent structures and helps to plan surgical approach and also makes a direct comparison with the follow up studies much simpler.

MRI is an essential tool for follow up patients treated clinically by giving cabergoline therapy, as well as in post-operative cases, to evaluate the response to treatment. When young patients are diagnosed with pituitary masses as a part of genetic syndrome then families of young patient should be offered genetic counselling.

### REFERENCES:

1. Elster AD. Imaging of the sella: Anatomy and pathology. *Semin Ultrasound CT MR.* 1993;14(3): 182–94.
2. Ezzat S, Asa SL, Couldwell WT, Barr CE, Dodge WE, Vance ML, et al. The prevalence of pituitary adenomas: A systematic review. *Cancer.* 2004;101:613-9.
3. Asa SL. Tumors of the Pituitary Gland. American Registry of Pathology in collaboration with the Armed Forces Institute of Pathology , AFIP, Washington DC. 2011;1:275..
4. Soni BK, Joish UK, Sahni H, George RA, Sivasankar R, Aggarwal R. A Comparative Study of Pituitary Volume Variations in MRI in Acute Onset of Psychiatric Conditions. *J Clin Diagn Res.* 2017. 11(2): TC01–TC04.doi: 10.7860/JCDR/2017/23585.9330
5. Marguth F, Oeckler R. Recurrent pituitary adenomas. *Neurosurg Rev.* 1985;8:221–224.
6. Saeger W, Ludecke DK, Buchfelder M, Fahlbusch R, Quabbe HJ, Petersen S. Pathological classification of pituitary tumours: 10 years of experience with the German Pituitary Registry. *Eur J Endocrinol.* 2007;156:203–16.
7. Tripathi KD. Treatment of hyperprolactinoma : Guideline, 8<sup>th</sup> Edn.: New Delhi. 2019;pp:261-62.

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