

# Pituitary Apoplexy Producing Internal Carotid and Basilar Artery Compression: A Rare Case Report

## Abstract

Pituitary apoplexy is a rare disease followed by ischemic or hemorrhagic process within the pituitary adenoma. Here, we report two cases of pituitary apoplexy with a history of sudden onset of headache, vomiting, and diminished vision. Our aim is to share our experience and discuss these cases as follows: the first one to know the compression of basilar artery along with the compression of basilar part of pons and in both the cases with compression of an internal carotid artery leading to cerebral infarcts.

**Keywords:** *Cranio-encephalic magnetic resonance imaging, pituitary Adenoma, pituitary hemorrhage, vasospasm, visual failure*

## Introduction

Pituitary apoplexy is a rare clinical syndrome characterized by sudden onset of headache, signs of meningeal irritation, visual impairment, ophthalmoplegia, and alteration in consciousness.<sup>[1-4]</sup> Pituitary apoplexy is a rare event characterized by the rapid expansion of a pituitary adenoma after a hemorrhagic event or schema and occurs in about 14%–22% of patients; age ranging from 38 to 85 with a mean age of 58.7 years.<sup>[5,6]</sup> However, the exact incidence of stroke in pituitary apoplexy is not described in the literature and is rare.<sup>[3]</sup> In the present study, both the cases were male and the ages were 40 and 38 years. Pituitary apoplexy constitutes a detection and salutary emergency. Most of the time, apoplexy is the expression marking the beginning of an adenoma unknown, but it can also complicate a known adenoma.<sup>[7]</sup>

Apoplexy in the pituitary tumor is uncommon and underdiagnosed entity. The calculated commonness from the epidemiological surveys of the operated patients suggests the incidence of 0.6–12.8.<sup>[8-10]</sup> Usually, apoplexy presents as neurological and endocrinological signs and symptoms. Headache due to raised intracranial pressure is the most common complaint (63%–100%) cases, followed by visual deficits (40%–100%),

cranial nerve palsies, and vomiting.<sup>[8]</sup> Male-to-female ratio is 2:1, and in most cases, presents in fifth or sixth decades of life.<sup>[11]</sup> Pituitary apoplexy can be asymptomatic and noticeable only after carrying out neuroimaging and is therefore called subclinical or subacute apoplexy. Pituitary apoplexy is more prone to occur in large pituitary tumors, for example, macroadenoma, whereas microadenoma (<1 cm diameter) is less susceptible to bleeding.<sup>[12]</sup> Pituitary adenomas enlarge quietly and then become symptomatic after an event such as head trauma, radiation therapy, sudden changes in intracranial pressure, dopamine agonist administration, hormone stimulation tests, lumbar puncture, or spinal anesthesia.<sup>[13,14]</sup> Here, we present two cases of adult male with pituitary apoplexy in whom cranio-encephalic magnetic resonance imaging (MRI) enabled to make the diagnosis.

## Case Reports

### Case-1

A 40-year-old male presented with acute onset of headache, vomiting, bilaterally diminished vision, left hemiplegia, altered sensorium, and irrelevant talk. On examination, the patient was drowsy, hemiplegic with neck stiffness, and left plantar reflex was extensor. Fundus examination was unremarkable. There was no papilloedema.

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MRI study showed the large pituitary macroadenoma in the sellar and suprasellar region causing extrinsic compression over the optic chiasma [Figures 1 and 2]. There was secondary hemorrhage within the adenoma. The adenoma was encasing the right cavernous internal carotid artery with luminal narrowing [Figures 2-4]. Diffusion-weighted images (DWI) showed multiple infarcts in the right frontal, parietal cortex, and right basal ganglia.

### Case-2

A 38-year-old male with pituitary macroadenoma presented with sudden onset of headache, vomiting followed by right-sided weakness progressing to altered sensorium, and ptosis of the left eye.

MRI brain showed hemorrhage within the pituitary macroadenoma [Figure 5]. The adenoma was encasing the left cavernous sinus, supraclinoid part of the internal carotid artery, and its terminal branches which are diminished in the caliber. Posteroinferiorly mass was extending into the prepontine cistern with the compression of the basilar

artery [Figure 6]. Pontine belly was also flattened secondary to compression. There were acute infarcts in the left basal ganglia and bilateral thalami due to the involvement of left middle cerebral artery [Figure 7]. Bilateral thalamic infarct raises the suspicion of involvement of the artery of Percheron; a solitary artery arising from the proximal segment of the posterior cerebral artery. It supplies the paramedial thalami and rostral midbrain bilaterally. It is named after the French neurologist Gerard Percheron who described it in 1973.

### Discussion

Sudden onset of a headache, vomiting, visual impairment, and decreased consciousness are common complication of pituitary apoplexy, whereas the cerebral infarct remains the secondary.<sup>[3]</sup> In our cases also the patient had sudden onset of all the symptoms discussed above along with left hemiplegia, hemiplegic neck stiffness, and left plantar reflex was extensor in Case 1, which is suggestive of right cerebral involvement along with upper motor neurone lesion. There were ophthalmoplegia and papilloedema.

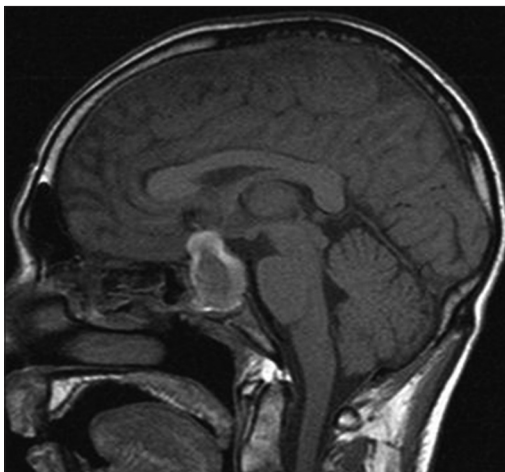


Figure 1: T1 Saggital image showing large sella suggestive of Pituitary apoplexy

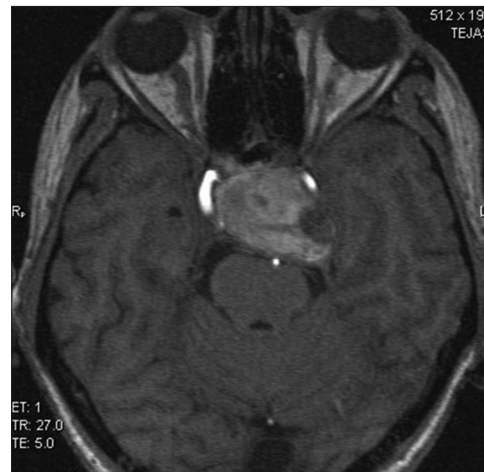


Figure 2: T1 Axial Image showing suprasellar mass with T1 hyperintensity suggestive of hemorrhage in pituitary macroadenoma

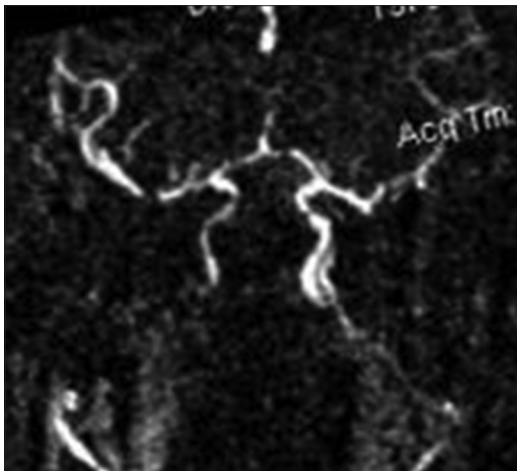


Figure 3: Shows the narrowing of right internal carotid artery and normal left internal carotid artery. Common carotid artery on both sides were normal



Figure 4: Shows the narrowing of right internal carotid artery and normal left internal carotid artery. Common carotid artery on both sides were normal

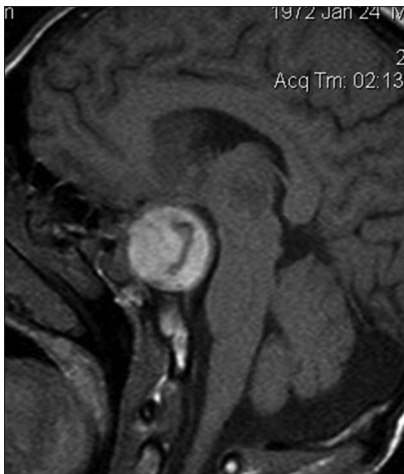


Figure 5: The diagram showing T2-hypointense area in the left side of the pituitary gland



Figure 6: Axial T2 image showing pituitary tumor compressing basilar artery in preponine cistern. Also note the compressed and flattened pontine belly

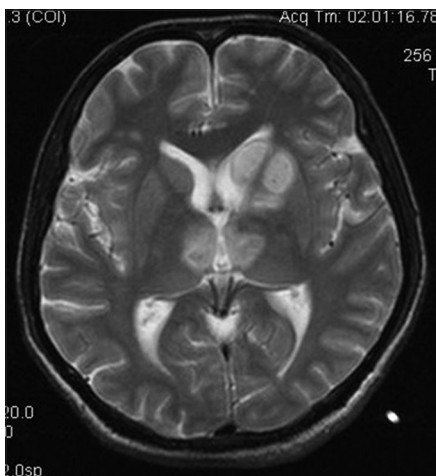


Figure 7: Showing bilateral thalamic infarct involving the left caudate nucleus and left lentiform nucleus.

In Case 2, there was weakness on the right side progressing to altered sensorium, which is suggestive of left cerebral involvement. MRI brain study showed the acute infarcts in

the left basal ganglia, and there was involvement of middle cerebral artery.

Usually, internal carotid artery stroke results in ipsilateral visual failure and contralateral hemiplegia.<sup>[4,15]</sup> In the present study, in Case no 2, there was compression of supraclinoid part of the left internal carotid artery which resulted in the weakness and signs of right hemiplegia. Ophthalmic manifestations were due to pituitary macroadenoma lateral expansion which compressed the 3<sup>rd</sup>, 4<sup>th</sup>, and 6<sup>th</sup> cranial nerves causing ophthalmoplegia. Furthermore, in our case, there was superior extension of the tumor compressing the left optic nerve and left the side of optic chiasma leading to diminished vision. Ptosis of left eye can be due to the involvement of parasympathetic fibers present in the 3<sup>rd</sup> nerve which was also compressed at the level of the cavernous sinus.

The probable two most important mechanisms of cerebral ischemic in patients with pituitary apoplexy are mechanical obstruction of the circle of Willis by the enlarging mass and cerebral arterial vasospasm.<sup>[1,4,16]</sup> The internal carotid artery was occluded in the cavernous sinus or the supraclinoid portion by the enlarged tumor in most of the cases.<sup>[17]</sup> The pathophysiology of the vasospasm could be the release of vasoactive substances from the necrotic tumor itself.<sup>[16,18]</sup> In our cases, the compression of cavernous and supraclinoid part of the internal carotid artery is the cause for the ischemic stroke.

Computed tomography scan and brain MRI is the best reference for the diagnosis, but cranio-encephalic MRI is the best reference for the diagnosis of pituitary adenoma and pituitary apoplexy complications.<sup>[7,19]</sup> In the present study, brain MRI was done which visualized the tumor and evaluate its extension and made it possible to assess the hemorrhagic process of the pituitary adenoma.

Pituitary apoplexy can cause narrowing of intracranial vessels by either in the cavernous sinus or in the supraclinoid portion is occludes by the enlarged tumor.<sup>[20]</sup> In the present study also, it was observed that the left internal carotid artery was compressed by tumor in left cavernous sinus and at the supraclinoid part. Further in our case, it was noticed that there was involvement of middle cerebral artery which leads to acute infarcts in basal ganglia. In the present study, the narrowing of these vessels can be due to mechanical compression due to enlarged suprasellar mass.

Pituitary apoplexy is associated with a pituitary lesion with hemorrhagic infarction, bilateral extra and intracranial, infra and supratentorial diffuse vasospasm, and brain infarction in the presence of normal cerebrospinal fluid. However, due to the release of vasoactive agents from the tumor is the most important factor leading to vasospasm of arteries.<sup>[21]</sup>

Similarly, classical finding in our case was noticed in the second case in which the pituitary adenoma;



posteroinferiorly mass was extending into the prepontine cistern with the compression of the basilar artery and pons resulting in flattening of the pons belly and infarcts in the basilar arterial territory. However, mechanical compression of the basilar artery in pituitary apoplexy is not well known, and to the best of our knowledge, this is the first case report in the literature. Furthermore, there were infarcts in bilateral thalami which raised the suspicion of involvement of artery of Percheron.

Prognosis of pituitary tumor has improved with declining morbidity and mortality. Factors which could include this are an early diagnosis, better mode of treatment, use of glucocorticoids, and refinement of surgical and postoperative techniques.<sup>[11]</sup> Indications of surgery are severe neuro-ophthalmic signs such as decreased visual acuity, persistent deteriorating visual field defects, or decreased levels of consciousness.<sup>[9]</sup> In the present study, such signs were present. Hence, the patient was referred to neurosurgeon for proper prognosis.

## Conclusion

Pituitary apoplexy is an unusual and diagnosed less frequently than its occurrence as the complication of pituitary adenoma. Patients have varied presentations. Pituitary apoplexy is an emergency diagnosis complication of pituitary adenoma; involving the functional and vital forecast.

To conclude, we have reported two cases of pituitary apoplexy in which enlarged sella is causing the mechanical compression over the internal carotid artery and basilar artery with resultant acute infarcts in the corresponding arterial territory. To the best of our knowledge and extensive literature search, the second case in our report is the first case in which basilar artery is compressed by the pituitary macroadenoma with the resultant infarcts in bilateral thalami which also raises the suspicion of artery of Percheron involvement.

Although, infarcts in the pituitary apoplexy are rare; they should be suspected in patient with unexplained neurological deficit and rapid progression of the symptoms. DWI sequence should be a part of pituitary imaging when pituitary apoplexy is suspected.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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