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### **Authors**

Ahlers, Michael J. Ahlers J.

Gardner, Julianna

Magorien, Julie E.

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## CLINICAL VIGNETTE

# A Classic Case of Pituitary Apoplexy

Michael J. Ahlers, MD, Julianna Gardner, MD and Julie E. Magorien, MD

Department of Medicine, David Geffen School of Medicine at UCLA, Los Angeles, CA

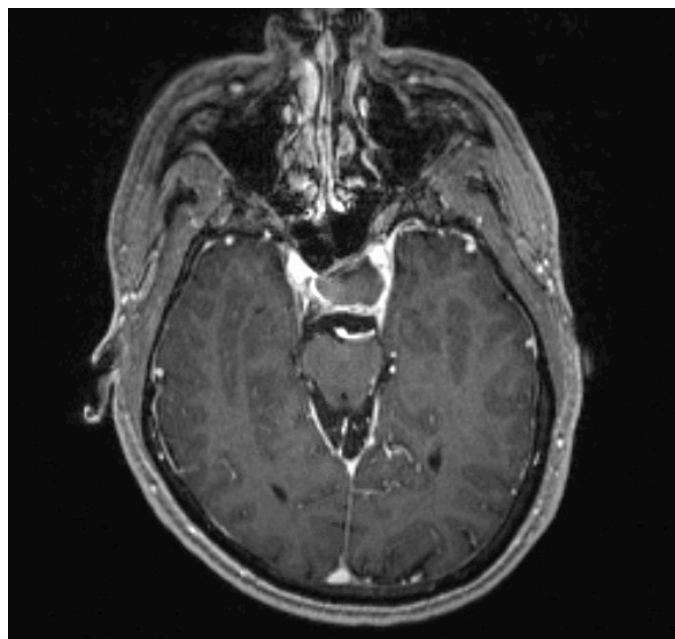
### Case

A 54-year-old-male with no significant past medical history presented to an outside hospital with severe headache. The left frontal headache was notable for its sudden onset and excruciating pain. On arrival to the outside hospital emergency room, CT brain was negative for an acute process and laboratory data was notable for a leukocytosis. He was given empiric amoxicillin/clavulanate for presumed sinus infection and discharged from the emergency room. At home, his headache persisted and he developed double vision and difficulty opening his left eyelid. He re-presented to the same outside hospital three days later. MRI brain identified a pituitary mass not seen on prior imaging. He was started on a heparin drip due to concern for cavernous sinus thrombosis, though there was no definitive evidence on MRI. During his third day of admission, his headache and double vision worsened and he progressed to complete left-sided ptosis. On day seven of symptom onset, the patient left against medical advice and presented to this hospital for evaluation.

On admission to this hospital, the patient reported ongoing severe, left frontal headache and inability to open his left eye. Exam was notable for complete left-sided ptosis and impaired extraocular movement with inability to elevate, adduct, or depress the eye. The left pupil was dilated to 8 mm and fixed with normal visual fields. WBC was 11.28 with otherwise normal basic metabolic panel. On MRI brain, there was a large pituitary mass with internal hemorrhage that obliterated the left cavernous sinus (Figure 1). His endocrine laboratory data showed: TSH 0.21, FT4 1.1, LH 1.0, FSH 1.4, prolactin 9.7, ACTH 13, and 8 am cortisol 4.

The patient was diagnosed with a non-functioning pituitary macroadenoma with hemorrhage, compressing cranial nerve III, complicated by pituitary apoplexy and subsequent pan-hypopituitarism. Hydrocortisone (followed by transition to stress-dose dexamethasone) and levothyroxine were given and neurosurgery was consulted. The patient noted significant improvement in headache following initiation of steroids. He underwent excision of the pituitary tumor via endonasal transsphenoidal approach on hospital day four. On day six of admission, the patient developed progressive hyponatremia and was diagnosed with SIADH. He was continued on stress-dose steroids, placed on fluid restriction, and hypertonic saline was initiated with appropriate correction. The patient was dis-

charged on hospital day nine with fluid restriction, salt tablets, a hydrocortisone taper, and outpatient follow up with neurosurgery, endocrinology, and ophthalmology. At a two month follow up, the patient had recovered function of the left third cranial nerve. He developed diabetes insipidus which was treated with desmopressin for two months. He also tolerated weaning of hydrocortisone, but remains on levothyroxine and testosterone gel.



**Figure 1**

MRI Brain/Orbits: There is a 2.3 x 1.6 x 1.4 cm heterogeneous mass within the left sella, consistent with a pituitary macroadenoma. The mass expands the sella and nearly obliterates the left cavernous sinus. Given T1 and T2 hyperintensity and peripheral enhancement, there is likely internal hemorrhage within the mass.

### Discussion

Pituitary apoplexy is an uncommon syndrome caused by sudden hemorrhage or infarction within a pituitary mass.<sup>1</sup> The pathophysiology of pituitary apoplexy is not entirely clear, but it is hypothesized that the pituitary mass outgrows its blood

supply leading to necrosis.<sup>2</sup> Increased metabolic demand and intrasellar pressure may also contribute to risk of hemorrhage. As with this patient, the most common type of pituitary adenoma susceptible to pituitary apoplexy is a nonfunctioning pituitary macroadenoma.<sup>3</sup> Pituitary apoplexy affects men more frequently than women, typically in the 5<sup>th</sup> and 6<sup>th</sup> decades of life as seen in this patient.<sup>4</sup>

Early management of pituitary apoplexy is crucial for a favorable clinical outcome, including vision preservation. Initiating appropriate and rapid treatment of pituitary apoplexy requires recognition of initial clinical features, as its management differs from many diagnoses considered on the differential for this presentation. The case presented classically features the two most common symptoms: headache (often thunder-clap) and visual disturbances.<sup>4,6</sup> Visual disturbances are caused by pressure on the optic chiasm and compression of cranial nerves III-VI. Less common and more variable in presentation are signs of meningeal irritation such as nausea/vomiting and altered mental status.

Nearly 80% of patients presenting with pituitary apoplexy have one or more hormone deficiencies such as central adrenal insufficiency, hypothyroidism, gonadotropin deficiency, and growth hormone deficiency.<sup>4</sup> Precipitating factors of pituitary apoplexy include systemic anticoagulation, medications like dopamine agonists, head trauma, pregnancy, or surgery.<sup>7</sup> The most recognized precipitant is initiation of anticoagulation, consistent with the worsening headache this patient reported following initiation of a therapeutic heparin drip. MRI scan is the imaging modality of choice for diagnosing pituitary apoplexy.<sup>7</sup>

For the internist, the most crucial step in management is immediate initiation of stress-dose steroids to prevent or treat hemodynamic collapse from cortisol deficiency, followed by multidisciplinary management with endocrine, neurosurgery, and neuroophthalmology regarding surgical versus conservative management. Corticotrophic deficiency is quite common in pituitary apoplexy, affecting approximately 50-80% of patients.<sup>5</sup> Corticosteroid should be administered at a strength sufficient to replace adrenal function. We suggest hydrocortisone 50 mg intravenously q6h consistent with previously published guidelines.<sup>8</sup> Treatment options include conservative measures (hormone replacement therapy, electrolyte repletion, intravenous fluids) or transphenoidal surgical resection. Indications for surgery include altered mental status, or severe visual field deficits or visual acuity deficits.<sup>1</sup> The pituitary apoplexy score (PAS), which factors a patient's level of consciousness, visual acuity, visual field deficit, and ocular paresis, can risk stratify patients leading those with higher scores (PAS >4) to surgical intervention.<sup>9</sup> Most patients with pituitary apoplexy have poor endocrine recovery of one or more of the pituitary hormones and require lifelong hormone replacement therapy.<sup>9</sup>

## Conclusion

- Pituitary apoplexy is a diagnosis most often on the differential of subarachnoid hemorrhage, bacterial meningitis, cavernous sinus thrombosis, and midbrain infarction that requires unique and urgent treatment from its mimickers.
- Stress-dose steroids (dexamethasone 4 mg q12h or hydrocortisone 50 mg q6h) should be initiated immediately if pituitary apoplexy is suspected. Baseline serologic studies of pituitary function should be obtained prior to the initiation of steroids.
- A multidisciplinary approach is necessary with endocrine, neurosurgery, and neuroophthalmology
- Treatment options include conservative measures or surgical approach.

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