

Keep an Eye on the Eye of your Patient: An Update on the Management of Post-CABG Pituitary Apoplexy

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September 15, 2022

Abstract

Pituitary apoplexy is a rare, potentially life-threatening complication which has been described after both on and off-pump CABG. However, never before has pituitary adenoma recurrence after prior resection and subsequent apoplexy leading to severe ophthalmoplegia following on-pump CABG been described. We present the case of a patient who previously underwent transsphenoidal resection of a pituitary adenoma who experienced oculomotor nerve palsy following on-pump CABG and was ultimately found to have a recurrent pituitary adenoma and apoplexy.

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Word Count: 810

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CASE PRESENTATION

The patient was a 62-year-old male with a history of hypertension, hyperlipidemia, and prior transsphenoidal resection of a pituitary adenoma in 2008 with a three-month history of left-sided ptosis, diplopia, and exophthalmos. He presented to the emergency department after experiencing two weeks of dizziness and chest pain where he was ultimately found to have an NSTEMI. He denied flashes, floaters, galactorrhea, and a CTA head/neck and CT head at the time of presentation were both unremarkable. The patient underwent an urgent left heart catheterization which revealed extensive three-vessel coronary artery disease, with the left anterior descending and circumflex arteries more than 70% occluded and the right main coronary artery more than 90% occluded; a transthoracic echocardiogram demonstrated an ejection fraction of 50% with

moderate hypokinesia of the interior and inferolateral walls. The patient was urgently taken to the operating room for coronary artery bypass grafting (CABG) x4 (LIMA to LAD, RIMA to DIAG, SVG to OM-PDA). Cross clamp time was 98 minutes, and core cooling temperature while on-pump was 34 C; ACT was between 625-786, and the lowest hemoglobin while on pump was 7.2.

However, on postoperative zero he developed worsening ptosis, a fixed, dilated pupil, and impaired left eye adduction with his eye fixated in a down-and-out position. A code stroke was called and stroke neurology was consulted, who found the patient to have oculomotor neuropathy with an NIH Stroke Score of 1; a CT head obtained at that time was grossly unremarkable. On postoperative day three, an MRI/MRA brain demonstrated significant sellar enlargement containing a markedly heterogeneous 13 mm by 13 mm lesion with anterior enhancement, directly abutting the right internal carotid artery with rightward pituitary stalk deviation and involvement of the left cavernous sinus without abutment of the optic chiasm (Figure 1). Furthermore, his almost-near panhypopituitarism further suggested pituitary adenoma recurrence with hemorrhage and apoplexy into the suprasellar space.

He was ultimately evaluated by neurosurgery, ophthalmology, and endocrinology all of whom recommended repeat resection of pituitary adenoma one month following his discharge, and he was ultimately discharged home with only his baseline degree of preoperative ptosis and exophthalmos on postoperative day eight.

COMMENT

Pituitary apoplexy is a rare, potentially life-threatening complication which has been described after both on and off-pump CABG.¹ In anywhere from 15% - 85% of patients, it may manifest as headache, ophthalmoplegia, ptosis, and anisocoria, with symptom onset typically by postoperative day two— however, symptoms may present in the immediate postoperative period or up to several weeks following surgery.^{1,2} It has been hypothesized that pituitary apoplexy during on-pump cardiac surgery is likely related to cerebral hypoperfusion, low perfusion pressures, hemodilution and non-pulsatile flow experienced while on cardiopulmonary bypass.³ Pituitary adenoma tissue is markedly more susceptible to ischemia and hemorrhage at baseline, likely due to both the thin-walled and abnormal sinusoidal nature of the tumor's vasculature; thrombotic events of atherosclerotic plaques and microvascular embolization while on-pump have also been implicated.⁴

While the literature does include approximately 20 reports of pituitary apoplexy-induced ophthalmoplegia after both on and off-pump coronary revascularization, never before has pituitary adenoma recurrence after prior resection and subsequent apoplexy leading to severe ophthalmoplegia after on-pump CABG been described. Of these existing case reports, only three patients were known preoperatively to have a pituitary adenoma, with one having received stress-dose steroids prior to the induction of general anesthesia and all ultimately undergoing transsphenoidal resection after hospital discharge.^{5,6,7} Patients with preexisting pituitary adenomas are at greater risk of apoplexy after CABG, and as such require preoperative urgent evaluation/imaging given the permanent, deleterious neurologic and endocrinologic complications— including hypothyroidism and Addisonian crisis— which may result.^{5,6} Our patient had previously undergone transsphenoidal resection of a pituitary adenoma years before his CABG, however given the chronicity of his symptoms he did not follow with a neurologist and moreover did not have preoperative imaging to suggest pituitary adenoma recurrence.

With respect to surgical strategy, the largest case series reporting on the outcomes of 4 patients with either known or incidentally-found pituitary adenomas undergoing CABG recommended against the routine use of cardiopulmonary bypass, noting that revascularization in these patients should be done off-pump to minimize the likelihood of pituitary apoplexy and the ensuing complications which may arise.⁷ Whether or not off-pump surgery is safer than on-pump CABG requires further investigation— yet, in the absence of data or evidence supporting the ideal perioperative management of CABG in patients found to have a pituitary adenoma, it is clear that an individualized approach is required for each patient, including a discussion of the risk of permanent neurological deficits which may be sustained during CABG. Our recommendation for all patients in either the elective or urgent perioperative settings with concerning, new-onset neurologic symptoms is to undergo head imaging to assess for the presence of a pituitary adenoma. In a majority found

to have pituitary adenoma preoperatively, we recommend pursuing off-pump CABG whenever possible; if surgery is non-urgent, we recommend pursuing neurosurgical evaluation for possible transsphenoidal resection prior to CABG to minimize the risk of inducing pituitary apoplexy.

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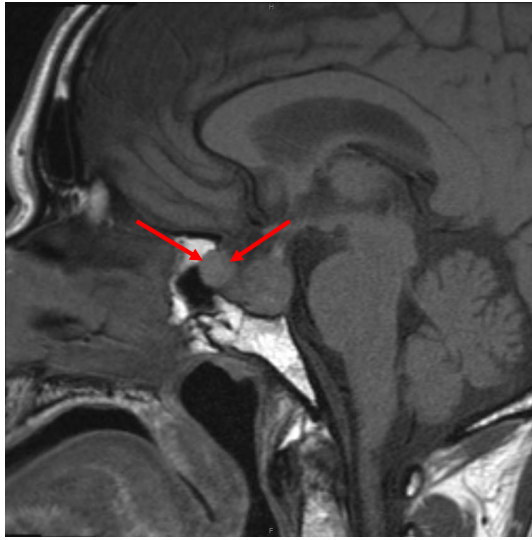


Figure 1. Grossly heterogeneous lesion with marked sellar remodeling and enlargement, with the absence of appreciable normal pituitary tissue. The sella is filled with a markedly heterogeneous lesion with areas of solid soft tissue, with areas of central hypoenhancement in the posterior sellar fossa. The mass does not abut the optic nerves, however the bilateral internal carotid arteries demonstrate mass effect upon the undersurface of bilateral cisternal optic nerves.