*Lesson of the week***Acute visual loss and pituitary apoplexy after surgery**

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Prompt recognition of pituitary apoplexy after major surgery allows endocrinological support and sight saving neurosurgery

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BMJ 2004;329:218-9

Pituitary apoplexy is a dangerous condition, often characterised by acute onset of headache, nausea, visual field loss, and ocular paresis.^{1 2} The condition is primarily caused by acute swelling of a pre-existing pituitary adenoma. Postmortem surveys have found incidental pituitary adenomas with a prevalence of 5-20%.³ The incidence of symptomatic apoplexy among pituitary tumours is 2-5%.^{1 2 4 5} These incidences indicate that pituitary apoplexy is more common than is being diagnosed. The underlying tumour is usually found only at the time of the apoplectic episode.⁶ The term "pituitary apoplexy" also describes acute enlargement of a non-tumorous gland, termed "Sheehan's syndrome," when seen in the context of obstetric haemorrhage.⁷

Pituitary apoplexy is initially misdiagnosed in more than three quarters of cases.⁴ Also, delayed diagnosis and treatment are more likely to result in permanent endocrinopathy and visual impairment.^{1 2} Death can result from unrecognised pituitary insufficiency or as a complication of decompression surgery. Overall deaths in recent studies varied from 0%^{2 5 6} to 7%.⁴

We present two cases of pituitary apoplexy and visual loss after major surgery. In both cases the patient had visual disturbance while recovering. These cases are diagnostically challenging because clinical features such as reduced consciousness and electrolyte abnormalities may be misinterpreted as iatrogenic post-operative complications.

Case reports**Case 1**

A 48 year old man had elective aortic valve replacement under warfarin anticoagulation. Preoperative sodium was 128 mmol/l. On the day after surgery he complained that the left eye was seeing only "noise" and that the right eye was not seeing at all to the right of the midline. An ophthalmologist assessed the patient at the bedside. Visual acuity was hand movements in the left eye and small print in the right eye but only the left half of words. The ophthalmologist noted a left relative afferent pupillary defect. Eye movements were normal and no papilloedema or disc pallor was seen.

Computed tomography scanning two days later showed an expansile sellar lesion with suprasellar extension. The posterior clinoids and the floor of the sella were eroded, and the suprasellar portion had a rim of calcification.

Warfarin was stopped. Vision deteriorated despite giving dexamethasone. On the sixth day after surgery, a neurosurgeon decompressed the pituitary gland with a transnasal trans-sphenoidal approach. This led to a dramatic improvement in vision. Histological investigation showed an almost completely infarcted adenoma. Four days after decompression, vision was fluent reading of small print with the right eye. Larger print could be read with the left eye.

Case 2

A 66 year old man had a laparotomy for obstructive jaundice due to a malignant mass. He had biliary and gastric bypass procedures. Two days after the operation, he was drowsy and complained of problems with his vision. On day seven, treating doctors sought an ophthalmological opinion: bedside examination revealed abnormal visual fields to confrontation. He seemed to have bilateral central visual loss to the right of the midline. He could only read large print. He had no relative afferent pupillary defect, and optic discs were normal.

Magnetic resonance imaging (figure) showed an expanded pituitary fossa and a large pituitary adenoma with suprasellar extension elevating the optic nerves and chiasm. Endocrinological consultation found longstanding symptoms which indicated hypopituitarism, and blood testing confirmed this. Prolactin concentrations were normal. Treating doctors gave him thyroxine supplementation and parenteral and then oral hydrocortisone. During the next week, his medical or visual status did not deteriorate, but a repeat magnetic resonance imaging scan showed no reduction in the size of the tumour.

On day 17 after laparotomy, the pituitary mass was decompressed by a transnasal, trans-sphenoidal approach. Histology showed necrotised tissue, which was strongly indicative of pituitary adenoma.

One month after surgery, visual acuities were of 6/5 bilaterally and visual field analysis showed a slight temporal defect to a small target. The man needed long term hydrocortisone and thyroxine supplementation.

Sagittal T1 weighted magnetic resonance image showing mass with rim of contrast enhancement extending from the pituitary fossa (arrow)

Discussion

The exact pathophysiology of pituitary swelling in apoplexy is uncertain, but, histologically, ischaemic necrosis or haemorrhage is usually present or sometimes both.⁴

General anaesthesia and surgery, especially cardiac surgery, expose patients to risk factors for apoplexy of a pituitary tumour. These include embolisation, mechanical ventilation, labile blood pressure, coughing, anticoagulation, and crystalloid haemodilution.^{8–11} The cases presented are therefore representative of a population at risk of pituitary apoplexy.

Signs and symptoms of pituitary apoplexy result from acute compression of perisellar structures, endocrinopathy, and meningeal irritation.

Four in five patients present with a visual field defect, but, contrary to popular teaching, only half have a bitemporal hemianopia.⁴ Our first patient was not unusual in having one eye more profoundly affected than the other. This was due to asymmetrical compression of the chiasm and optic nerves.

We could not formally quantify the visual field defects because the patients were too unstable to leave their beds and too unwell to give reliable results in such investigations. This problem is likely to be seen often in patients who have recently had major surgery. Simple bedside examination of visual acuity, pupil reactions, and visual fields can be enough to identify the underlying pathology.

Ophthalmoplegia is a useful sign in conjunction with a sellar mass because it indicates apoplexy rather than a simple adenoma. This is caused by the mass having extended laterally into the cavernous sinus. Three quarters of apoplexy cases present with an eye movement abnormality,² but this was absent in our cases.

Recognising that acutely expansile pituitary lesions may not cause papilloedema or optic atrophy is important. The discs were normal in both of our cases.

A pituitary mass may compromise hypothalamic function leading to impaired regulation of blood pressure, temperature, cardiac rhythm, and level of consciousness. These changes may be falsely attributed to the iatrogenic effects of surgery and general anaesthesia.

In patients with reduced consciousness it may not be possible to get a history of endocrine dysfunction. Amenorrhoea, gynaecomastia, impotence, and weight gain should specifically be asked about. Symptoms of endocrinopathy have been found in over a third of cases of pituitary apoplexy.^{2–5} We discovered a history of endocrine dysfunction in case 2 only when the patient had recovered from the acute illness.

In case 1 we found hyponatraemia—an important biochemical clue of endocrinopathy—present in 75% of patients at presentation.⁶ This probably reflects an established adrenocorticotrophic hormone deficiency and hypoadosteronism.

Meningeal irritation caused by extravasated blood in the subarachnoid space can lead to diagnostic confusion. The commonest misdiagnosis is an intracranial aneurysm with subarachnoid haemorrhage.⁴ The differential diagnosis includes meningitis, cerebrovascular accident, cerebral metastatic disease, cavernous sinus thrombosis, and transtentorial herniation. The

key to diagnosis is appropriate diagnostic suspicion prompting early neuroimaging and urgent hormonal assessment.

Patients who have recently had major surgery are at increased risk of pituitary apoplexy. They are particularly difficult to diagnose correctly and a delay in diagnosis and treatment is likely to adversely affect their outcome. This particularly applies to visual pathway compression where permanent visual damage is more likely if decompression is delayed.^{1–12} In the cases reported here visual acuity was improved from levels suitable for blind registration to almost normal.

We thank I Wilson and JAC Buckels for access to case notes and the initial referrals and also EB Rolfe for the image. AR Walsh and GS Cruikshank did the neurosurgery. P Stewart managed the endocrinopathy in case 2 and we are grateful for his advice regarding the final article.

Contributors: GRK was the examining ophthalmologist in both cases. JA wrote the initial draft document and both authors jointly produced the final article. GRK is guarantor.

Funding: None.

Competing interests: None declared.

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(Accepted 5 March 2004)

Endpiece

Women and halfe witted men

The English are easier than any other Nation infatuated by the prospect of universal medicines, nor is there any other Country in the World where the Doctors raise such immense Fortunes. I attribute it to the Fund of Credulity which is in all Mankind. We have no longer faith in Miracles and Reliques, and therefore with the same Fury run after receipts and Physicians. The same money which 300 years ago was given for the health of the Soul is now given for the Health of the body, and by the same sort of people: Women and halfe witted Men.

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