

# Pituitary apoplexy presenting during pregnancy

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## ABSTRACT

Pituitary apoplexy during pregnancy is a rare but serious event with significant morbidity and even possible mortality if not recognised in time. A 26-year-old woman was admitted with sudden onset of severe headache, vomiting, disturbed consciousness and photophobia. MRI showed a pituitary apoplexy. Adrenal insufficiency with circulatory shock was present together with deficiency of the other hormones produced by the adenohypophysis. After treatment with glucocorticoids, diabetes insipidus developed for which treatment was given. She was treated conservatively and the clinical picture improved in a few days, followed by an uneventful pregnancy and delivery. A second MRI showed regression of mass effect with tumour expanding into the left cavernous sinus. No signs of tumour progression or abnormal hormone secretion have occurred up to one year after the event. Complete pituitary insufficiency has remained. The literature on the subject is reviewed with special emphasis on the circumstances in which pituitary apoplexy occurred and on the treatment of this endocrine emergency.

In conclusion, pituitary apoplexy is a rare complication of pregnancy. The severe consequences of missing the diagnosis underline the importance of this potentially lethal endocrine emergency.

## INTRODUCTION

Pituitary apoplexy is a clinical syndrome consisting of sudden onset of severe headache, altered consciousness, vomiting, visual disturbances and ophthalmoplegia. It is

caused by haemorrhage and/or infarction in the pituitary gland. Usually a pre-existing pituitary adenoma is present but it has also occurred in lymphocytic hypophysitis. Pituitary apoplexy has been associated with various conditions. The occurrence during pregnancy is rare and there have only been a few reports in the literature.

In this case report we present a woman who developed pituitary apoplexy during pregnancy as the first manifestation of a pituitary adenoma.

## CASE REPORT

A 26-year-old woman was admitted to the gynaecological ward because of severe headache and nausea in the 23<sup>rd</sup> week of her second pregnancy. Her first pregnancy had been uneventful, as had her second up to three days before admission. Before the onset of this pregnancy she reported nine months of amenorrhoea. On admission she complained of a sudden onset of severe continuous headache radiating to the neck accompanied by nausea, vomiting and photophobia.

On physical examination, lowered consciousness and extreme photophobia were present. There were no signs of meningismus. Visual acuity could not be determined because of the photophobia. Diplopia was present on lateral gaze in both directions. No signs of other cranial nerve dysfunction were noticed. Fundoscopy showed papilloedema. Laboratory results for haematology were normal and CRP was slightly elevated at 10 mg/l (normal <3). Serum sodium was severely lowered (107 mmol/l, normal 136 to 146).

Potassium concentration was slightly decreased (3.4 mmol/l, normal 3.8 to 5.0), probably due to the vomiting and serum creatinine was normal (30  $\mu$ mol/l, normal <110). Urine sodium concentration was low (3 mmol/l).

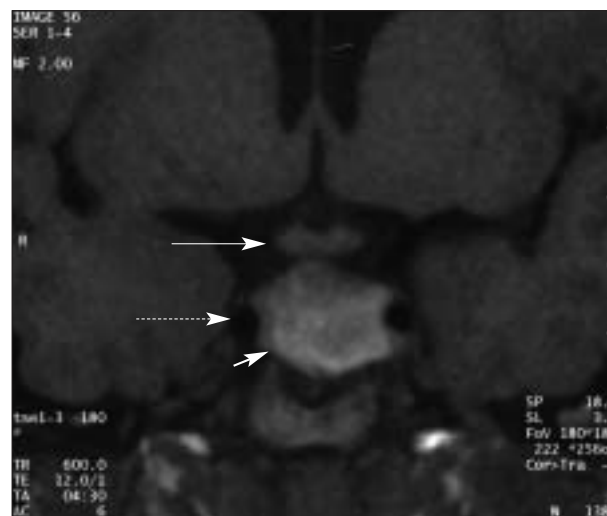
The consulting neurologist's most probable diagnosis was a sagittal sinus thrombosis and an MRI scan combined with MRA was performed. No signs of thrombosis were present, however a 2 cm large pituitary tumour was seen (figures 1a and b). On the  $T_1$  weighted image the signal intensity was high and on  $T_2$  low, compatible with haemorrhage in a pituitary mass.

When first seen by the endocrinologist she was in shock and after blood was drawn 100 mg of hydrocortisone was given directly intravenously, followed by a constant infusion of 200 mg per 24 hour. Intravenous fluid expansion was given to restore adequate circulation in the next hour followed by infusion of a 0.9% sodium-chloride solution. Subsequently polyuria developed for which treatment with desmopressin was initiated.

Laboratory results before hydrocortisone were as follows: cortisol 0.69  $\mu$ mol/l, prolactin 912 mU/l (normal 70 to 500),  $FT_4$  5.9 pmol/l (normal 11 to 24), IGF-I 4.9 nmol/l (normal 10 to 45). In the next few days the patient developed temporary paresis of both fourth cranial nerves followed by complete recovery of all ocular pareses. Clinical improvement continued in the following days and after suppletion of hydrocortisone, thyroxine and desmopressin, the pregnancy developed uneventfully. A new MRI eight weeks later showed regression of the pituitary mass with signs of invasion of the left cavernous sinus, comparable with a pre-existing pituitary tumour. Delivery after 38 weeks of pregnancy was uneventful and a healthy son was born. One year after the event no signs of pituitary tumour growth or hormone overproduction are present, although panhypopituitarism remains.

## DISCUSSION

Pituitary apoplexy, first described by Baily in 1898, is an endocrine emergency with significant morbidity and mortality if not recognised in time.<sup>1</sup> The incidence in surgical series of pituitary tumours is somewhere between 0.5 and 10%.<sup>2,5</sup> In 80% of cases, pituitary apoplexy is the presenting symptom of a pituitary adenoma, as in our patient.<sup>4,5</sup> It is thought to be caused by either infarction, haemorrhage or possibly both in the pituitary; however the pathophysiology remains unknown.<sup>6,7</sup> Asymptomatic necrosis and/or haemorrhage occurs more often and is found in up to 28% of pathologically examined pituitary adenomas.<sup>2</sup> Pituitary apoplexy has been associated with several conditions, such



**Figure 1A**  
*Coronal  $T_1$ -weighted image of the pituitary gland*  
White arrow: optic chiasm, short arrow: pituitary gland, broken arrow: internal carotid artery.



**Figure 1B**  
*Sagittal  $T_1$ -weighted image of the pituitary gland*  
White arrow: haemorrhagic part of pituitary gland, broken arrow: enlarged pituitary mass, short arrow: pituitary stalk.

as hypertension, dynamic testing of pituitary function, use of GnRH analogue, bromocriptine, anticoagulants and general anesthesia.<sup>4,8-16</sup> Pituitary apoplexy during pregnancy is very rare. We found only seven cases in the literature: three were macroprolactinomas, two growth hormone-secreting adenomas, one was nonsecretory and no information was presented in one case.<sup>17-23</sup> Table 1 shows the presenting symptoms and signs, treatment and outcome. In retrospect, no clinical signs of hormone overproduction were present in our patient at the event and during her follow-up no signs of a hormonally active adenoma were measured or observed either.

In pregnancy, especially in the third trimester the clinical picture of pituitary apoplexy shows considerable resemblance to lymphocytic hypophysitis. Both can present as a suprasellar mass on magnetic resonance imaging. On T<sub>1</sub> weighted images they can be differentiated as haemorrhage usually shows hyperintensity and hypophysitis is classically hypointense compared with the rest of the brain.<sup>24</sup> Pituitary apoplexy in a case of lymphocytic hypophysitis during pregnancy has also been reported.<sup>25</sup> Our patient's most likely underlying disease is a pituitary adenoma as on follow-up MRI there is clear invasion of the cavernous sinus.

Although cavernous sinus invasion has been reported in lymphocytic hypophysitis this has only occurred in males thus far.<sup>2</sup> The normal pituitary gland increases in size during pregnancy with a total increase of 3 mm at the end of pregnancy. The existing adenoma in our patient together with the normal increase in the pituitary gland during the pregnancy could have compromised the blood supply too, either leading to infarction or haemorrhage. Oestrogens in an experimental animal model cause hyperaemia of the hypophysis and could therefore contribute to the risk of pituitary apoplexy in pregnancy.<sup>27</sup> Treatment of pituitary apoplexy consists of replacement of the deficient hormones, especially glucocorticoids, close surveillance and transsphenoidal surgery. Some advocate conservative management except if no spontaneous improvement or worsening of visual impairment and/or consciousness occurs.<sup>28</sup> Others prefer direct surgery, preferably within the first eight days after the event, claiming that this intervention improves outcome regarding both visual impairment and pituitary function.<sup>5,29</sup> No clinical trials comparing these two treatment strategies have been carried out so far. Although transsphenoidal surgery during pregnancy is safe,

we chose conservative management in our patient as rapid clinical improvement followed treatment with glucocorticoids and desmopressin. Whether pituitary function could have been saved by early surgery in our patient remains unknown.

In conclusion we present a rare complication of a pituitary tumour during pregnancy with severe consequences underlining the importance of the diagnosis pituitary apoplexy.

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**Table 1**

*Signs, symptoms, treatment and outcome in six cases of pituitary apoplexy presenting during pregnancy as reported in the literature*

REFERENCE	FUNCTIONALITY TUMOUR	SIGNS/SYMPTOMS	TREATMENT	OUTCOME
17	Prolactinoma	Headache, vomiting, left abducens paresis, fatigue	Hydrocortisone, thyroxin	Uneventful pregnancy, complete recovery
18	Prolactinoma	Headache, left-sided ptosis, coma	Left frontal craniotomy, bromocryptine	Left-sided third cranial nerve palsy
19	Growth hormone	Headache, bitemporal hemianopsia, decreased visual acuity	Transsphenoidal decompression	Complete recovery of vision and visual fields
20	Growth hormone	Headache, vomiting, blurred vision	Transsphenoidal decompression	Complete recovery
22	Prolactinoma	Headache, hemianopsia, left-sided ophthalmoplegia	Transsphenoidal decompression	Complete recovery
23	Nonsecretory	Headache, bitemporal hemianopsia	Transsphenoidal decompression	Minimal diplopia

No data were available for reference 21.

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