Symptomatic hypopituitarism revealing a primary empty sella turcica

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Summary
A 64-year-old nulliparous woman presented with clinical signs of thyroid and adrenocortical insufficiency. Subsequent hormonal investigations demonstrated a failure of all anterior pituitary functions. Pneumotomo-encephalography revealed a large arachnoid herniation, leading to the diagnosis of primary empty sella turcica syndrome with secondary panhypopituitarism. This unusual observation emphasizes the necessity of ruling out an empty sella turcica syndrome in patients with pituitary insufficiency.

Introduction
Primary empty sella turcica syndrome is a frequent cause of enlarged sella turcica (Weisberg, Zimmerman and Frantz, 1976), although in a few cases it has also been documented in sellas of normal size (Bergland, Ray and Torack, 1968). In some subjects, the syndrome remains asymptomatic for prolonged periods and the diagnosis is only made at post-mortem or following routine X-rays (Neelon, Goree and Lebovitz, 1973). When clinical signs are present, headache is the most frequent initial symptom (Berke, Buxton and Kokmen, 1975; Jordan, Kendall and Kerber, 1977). Clinical signs of endocrine disturbances are uncommon (Brisman, Hughes and Holub, 1972; Faglia et al., 1973). The present article reports an unusual case of empty sella turcica, with clinical symptoms of panhypopituitarism.

Case report
A 64-year-old woman was referred to the hospital because of muscular cramps, intense asthenia, anorexia, nausea, postprandial vomiting and severe constipation. These symptoms developed one month before admission. This nulliparous patient had normal menses until the age of 44 years. She had had a mixed parotid tumour, treated by surgery and radiotherapy 20 years before, and had suffered minor cranial trauma without loss of consciousness 5 years before. Headaches were noted subsequently but were never investigated.

Physical examination revealed an apyretic obese woman (74 kg, 164 cm). Her skin was dry and pale, her hair was brittle, sparse and coarse. Pubic and axillary hair was scarce. The relaxation phase of deep tendon reflexes was prolonged. Blood pressure was 100/60 mmHg in supine and standing positions. Heart rate was 72/min. The rest of the examination was normal.

Laboratory investigations are summarized in Table 1 and as follows: thyroxine 37-4 nmol/l; triiodothyronine 0-7 mmol/l; sodium 115 mmol/l; potassium 3-8 mmol/l; chloride 96 mmol/l; haematocrit 29%. Basal plasma concentrations of thyroid hormones and of cortisol, and urinary excretion of 17-hydroxysteroids (17-OHCS) and 17-ketosteroids (17-KS) were sub-normal. Plasma gonadotrophins were low, especially if compared with post-menopausal values. Plasma thyroid stimulating hormone (TSH) was undetectable. Hyponatraemia and normochromic microcytic anaemia were present. Fasting plasma glucose concentrations were within normal limits.

Despite a fall of the plasma glucose concentrations to 1-5 mmol/l (induced by only 0-05 u./kg body weight of insulin), no increase of plasma cortisol, growth hormone or prolactin was observed following insulin-induced hypoglycaemia. Metyrapone elicited no significant steroid response. In contrast, a marked cortisol increase occurred after intravenous injection of tetraacosactrin. Plasma values of thyrotrophin, gonadotrophins and prolactin remained unchanged during a combined LHRH-TRH stimulation test.

Visual fields and eye fundus were normal, standard X-rays of the skull and sellar tomography disclosed
moderate enlargement and ballooning of the sella turcica.

These findings were consistent with a diagnosis of panhypopituitarism secondary to a pituitary tumour. Considering the patient's clinical state, corticoid and thyroid replacement therapy was immediately started, before completing further investigations. Therefore, a pneumotomo-encephalographic examination was performed only several months later. It allowed visualization of a large arachnoid herniation, which filled up the sella turcica with air, leaving a small pituitary residue in the postero-inferior region, without any sign suggesting a pituitary tumour (Fig. 1). Thus, the final diagnosis was primary empty sella turcica syndrome with secondary panhypopituitarism. Hormonal therapy at present consists of cortisone acetate (25 mg in the morning, 12-5 mg in the evening) and of l-thyroxine (0-15 mg daily).

**Discussion**

The empty sella turcica syndrome accounts for about 25% of enlarged sellas (Weisberg et al., 1976). Most patients are obese (75–95%), hypertensive (29–58%) females (87–91%) (Neelon et al., 1973; Jordan et al., 1977). The syndrome is most often diagnosed in patients aged 40–55 years. The clinical symptoms include headache (45–80%), rhinorrhoea (0–8%) (Weisberg et al., 1976; Berke et al., 1975), but 38% are asymptomatic. A clinical picture of pituitary insufficiency is exceptional, although abnormal hormonal status may be revealed by laboratory studies (Weisberg et al., 1976; Brisman et al., 1972).

In a few cases, hormonal disturbances could be related to the association of empty sella turcica with the infarction of a hormonally active pituitary adenoma revealed at pneumoencephalography (5 cases of prolactinomas (Jordan et al., 1977; Schaizon and Metzger, 1969; Bar, Mazzaferr and Malarkey, 1975; Bryner and Greenblatt, 1977), 2 cases of Cushing's disease (Ganguly et al., 1976; Mortara and Norrell, 1970), 2 cases of acromegaly (Neelon et al., 1973; Molitch et al., 1977). Diabetes insipidus associated with primary empty sella syndrome was reported in 4 cases (Schaizon and Metzger, 1969; Cupps and Wolff, 1978; Marisson and Pimstone, 1973). Two cases with gonadotrophic insufficiency (Neelon et al., 1973; Bernasconi, Giovanelli and Papo, 1972) were also described. Five patients were found to have panhypopituitarism; 2 of them presented with clinical

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**Table 1. Stimulation tests**

<table>
<thead>
<tr>
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<th>Insulin tolerance test (0:05U./kg i.v.)</th>
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<tbody>
<tr>
<td>Time (min)</td>
<td>-30</td>
</tr>
<tr>
<td>Glucose (mmol/l)</td>
<td>4-0</td>
</tr>
<tr>
<td>Cortisol (μmol/l)</td>
<td>55-2</td>
</tr>
<tr>
<td>GH (μU./ml)</td>
<td>≤1-1</td>
</tr>
<tr>
<td>PRL (μU./ml)</td>
<td>21</td>
</tr>
</tbody>
</table>

**Metyrapone stimulation test**

(750 mg/4 hr for 24 hr)

<table>
<thead>
<tr>
<th>Metyrapone stimulation test (750 mg/4 hr for 24 hr)</th>
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<tbody>
<tr>
<td>Day</td>
</tr>
<tr>
<td>Urinary 17-OHCS (μmol/24 hr)</td>
</tr>
<tr>
<td>Urinary 17-KS (μmol/24 hr)</td>
</tr>
<tr>
<td>Time (min)</td>
</tr>
<tr>
<td>Urinary 17-OHCS (μmol/24 hr)</td>
</tr>
<tr>
<td>Urinary 17-KS (μmol/24 hr)</td>
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**Tetracosactrin stimulation test (0:25 mg i.v.)**

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<thead>
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<tbody>
<tr>
<td>Time (min)</td>
</tr>
<tr>
<td>Cortisol (μmol/l)</td>
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**Gonadotrophin releasing (LHRH) and thyrotrophin releasing hormone (TRH) stimulation test**

(200 μU. and 100 μU. i.v.)

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<th>Gonadotrophin releasing (LHRH) and thyrotrophin releasing hormone (TRH) stimulation test (200 μU. and 100 μU. i.v.)</th>
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</thead>
<tbody>
<tr>
<td>Time (min)</td>
</tr>
<tr>
<td>TSH (μU./ml)</td>
</tr>
<tr>
<td>PRL (μU./ml)</td>
</tr>
<tr>
<td>LH (μU./ml)</td>
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<tr>
<td>FSH (μU./ml)</td>
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</tbody>
</table>

TSH = thyroid stimulating hormone; PRL = prolactin; LH = luteinizing hormone; FSH = follicle stimulating hormone.
myxoedema (Neelon et al., 1973; Cupps and Woolf, 1978), one patient was admitted with generalized weakness and loss of appetite (Mortara and Norrell, 1970), and two subjects had a picture of panhypopituitarism (without further details), secondary to meningo-encephalitis and cranial trauma respectively (Schaison and Metzger, 1969).

The patient described in the present paper was, as usual, an obese female, but the clinical picture was quite unusual. Although headache was present, the clinical status was dominated by signs of thyroid and adrenocortical insufficiency. Because of the age of the patient, clinical signs of possible gonadotropic and somatotropic insufficiency were not observable. Subsequent hormonal investigations demonstrated a failure of all anterior pituitary functions. Despite the absence of clinical, biological and radiological signs of pituitary tumour, the hypothesis of an association of empty sella turcica with infarction of a pituitary adenoma could not be absolutely ruled out.

This cause emphasizes the need to rule out an empty sella turcica syndrome in all cases presenting with a pituitary insufficiency, a sellar enlargement, or both.

Acknowledgments
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References

Case reports

FIG. 1. Sagittal tomogram of sella turcica during pneumo-encephalography.
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