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Case Report

Pituitary adenoma apoplexy with initial presentation mimicking bacterial meningoencephalitis: a case report

Abstract

Pituitary apoplexy is a rare but life-threatening disorder. Clinical presentation of this condition includes severe headache, impaired consciousness, fever, visual disturbance, and variable ocular paresis. Signs of meningeal irritation are very rare. However, if present and associated with headache, fever, and pleocytosis, meningeal irritation may lead to misinterpretation as infectious meningoencephalitis. To the best of our knowledge, pituitary apoplexy with an initial presentation mimicking infectious meningoencephalitis had rarely been reported in the literature. Here, we report a 57-year-old man who had acute severe headache, high fever, neck stiffness, disturbance in consciousness, and left ocular paresis. Laboratory data showed leukocytosis, an elevated C-reactive protein level, and neutrophilic pleocytosis in the cerebrospinal fluid. Because bacterial meningoencephalitis was suspected, empiric antibiotic therapy was administered but in vain. Further examinations indicated a diagnosis of pituitary adenoma with apoplexy. After the immediate administration of intravenous corticosteroid supplement and surgical decompression, the patient recovered.

Pituitary apoplexy, a rare but life-threatening condition, usually results from hemorrhage or infarction-induced swelling in a pituitary adenoma [1]. The clinical manifestations of pituitary apoplexy in general include acute headache, impaired consciousness, vomiting, visual impairment, and ophthalmoplegia. Signs of meningeal irritation are very rare and are usually not reported as symptoms on presentation [2]. However, the presence of meningeal irritation may lead to misdiagnosis as a case of infectious meningoencephalitis and delay in the correct management of the disease. To the best of our knowledge, patients who have pituitary apoplexy with initial presentation mimicking infectious meningoencephalitis were rarely reported in the literature [2-4]. Here, we describe a rare case of a patient with pituitary apoplexy with an initial presentation mimicking acute bacterial meningoencephalitis associated with a pituitary abscess. Because there was minimal clinical improvement with antimicrobial therapy, the patient was reevaluated, and pituitary adenoma with apoplexy was diagnosed after surgical treatment.

A 57-year-old man, with a history of hypertension and diabetes mellitus that were controlled with regular medication for 7 years, presented with acute severe headache in the frontal region, nausea, and vomiting after drinking some red wine. He approached the local clinic for treatment, where he was administered oral analgesics. However, the headache deteriorated. The patient presented with ptosis of the left eye, left ophthalmoplegia, and drowsiness 2 days later, and he was referred to our hospital. On examination, his blood pressure was 149/83 mm Hg; pulse rate, 74 beat/min; body temperature, 38.3°C; and respiration rate, 16 breaths/min. The patient was drowsy but still responsive. Marked stiffness in the neck was noted. No bruits could be heard over the neck and orbital regions. Neurological examination revealed a dilated left pupil, with a diameter of approximately 5 mm exhibiting no light reflex, partial ptosis of the left eye, and palsy of the left oculomotor and trochlear nerves. Complete visual field defect was noted in the left eye, and visual field defect in the temporal region was noted

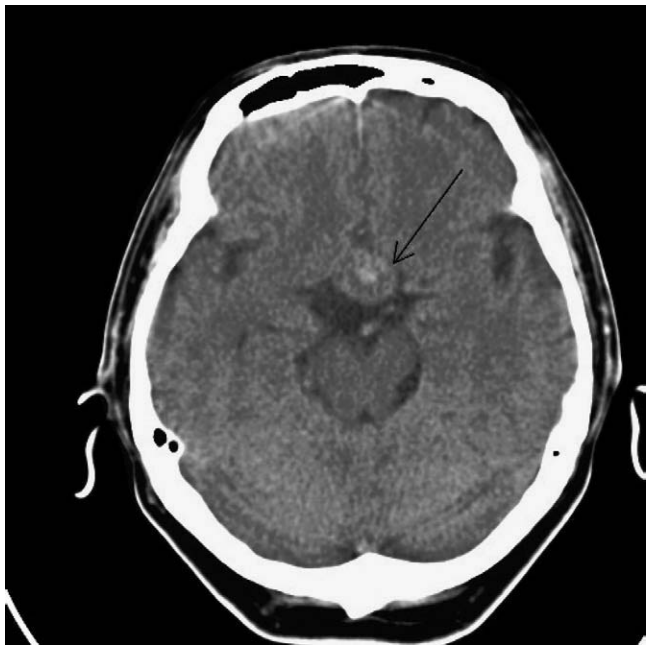

Fig. 1 Computed tomography of brain in axial plane showing a pituitary mass lesion.

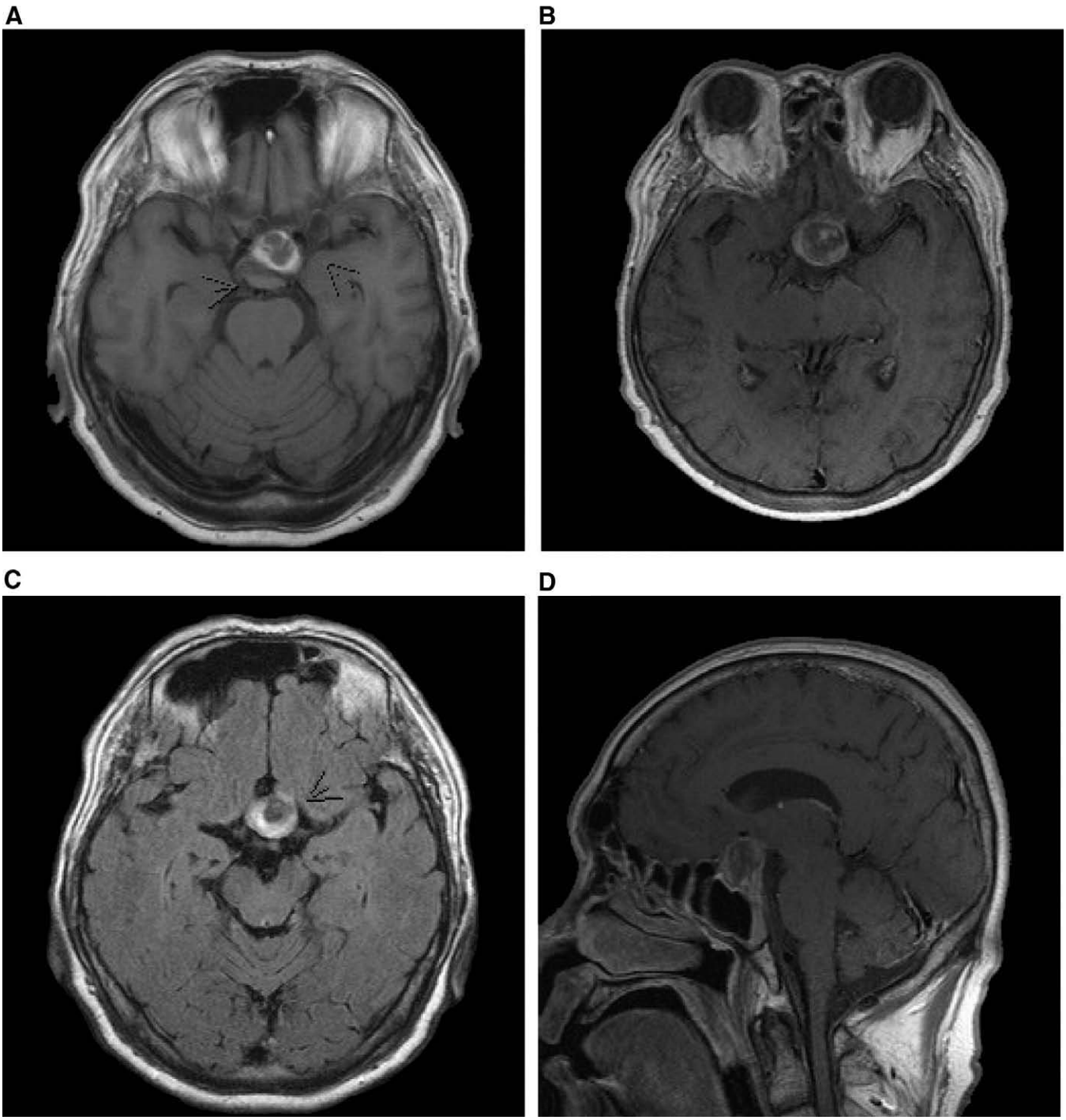

Fig. 2 Brain MRI of this patient. A, Axial view of T1WI. B, Axial view of T1WI with contrast injection. C, Axial view of fluid-attenuated inversion recovery (FLAIR). D, Sagittal view of T1WI with contrast injection.

in right eye. Results of other neurological examinations were normal. Urgent computed tomography (CT) and magnetic resonance imaging (MRI) scans of the brain showed a pituitary mass lesion (Figs. 1 and 2). The laboratory evaluations revealed neutrophilic leukocytosis (13 600/mm^3, 66% neutrophils); elevated C-reactive protein (108.74 mg/L), creatinine (2.15 mg/dL), and blood sugar (498 mg/dL); an absence of blood keto acids; and normal blood osmolarity. Taking into account the stiffness in the neck, leukocytosis, and elevated C-reactive protein level, acute meningitis was suspected, and the cerebrospinal fluid (CSF) was examined. The opening and closing pressures were 175/135 mmH_2O, respectively. CSF analysis revealed an increased leukocyte count (580/μL), with neutrophilic granulocytes (84%) predominating, increased total protein content (153.4 mg/dL), and elevated lactate (37.8 mg/dL)

level. The sugar content of the CSF was found to be 136 mg/dL. The results of the Gram staining of CSF, cryptococcal antigen level, tuberculosis polymerase chain reaction, and culture were normal.

After admission, vancomycin (1 g/d), ceftriaxome (2 g per 12 hours), and metronidazole (500 mg per 6 hours) were used for treating the suspected bacterial meningitis. However, the patient's consciousness continued to deteriorate, and high fever (up to 39.9°C) was noted in the next 5 days. Increased C-reactive protein level (239 mg/L) and decreased cortisol levels (3 μg/dL at 8:00 AM, 2 μg/dL at 4:00 PM) were noted. A complete analysis of the anterior pituitary hormones was performed (Table 1). Cortisone substitution was immediately started (methylprednisone, 40 mg per 12 hours). The patient's consciousness and body temperature improved gradually. However, ptosis and ophthalmoplegia in the left eye were still noted. On day 7, the patient was operated on using a left-supraorbital keyhole approach, and 1 gray-reddish capsulated mass was noted between the left optic nerve and the internal carotid artery, with impingement into the left oculomotor nerve. The tumor was completely removed. The pathological reports indicated pituitary adenoma with apoplexy. Antibiotic therapy was discontinued on day 10, and the fever subsided. There was an improvement in the patient's ophthalmoplegia 2 weeks after the operation; however, partial ptosis in the left eye persisted.

Pituitary apoplexy is a rare and potentially life-threatening condition. The incidence of this condition reported in the literature is variable and ranges from 0.6% to 27.7% [5]. The clinical features of pituitary apoplexy include acute severe headache, vomiting, ophthalmoplegia, and, occasionally, signs of meningeal irritation [2]. When patients present with signs of meningeal irritation, headache, and fever, pituitary apoplexy may be misdiagnosed as subarachnoid hemorrhage, acute meningoencephalitis, or migraine, and this misdiagnosis may lead to delayed treatment [4]. Our patient presented with acute headache, drowsiness, fever, stiffness of the neck, and ptosis and ophthalmoplegia in the left eye. In addition, laboratory findings indicated leukocytosis, an elevated C-reactive protein level, and neutrophilic pleocytosis. All the above findings led to an initial diagnosis of acute bacterial meningoencephalitis. Although the initial CT scan of the brain showed a pituitary mass lesion, we considered that it might be a pituitary abscess associated with bacterial meningitis. This assumption was influenced by the patient's history of diabetes mellitus, due to which he was in a relatively immunocompromised status. Further, the patient exhibited typical symptoms of acute meningoencephalitis. However, results of the cultures of the CSF and blood were all negative, and the patient's general condition deteriorated despite empiric antibiotic therapy. In addition, adrenal insufficiency was also noted later. Within 2 days of the start of cortisone substitution, the patient showed an improvement in consciousness and fever. After surgical treatment, the patient was rediagnosed with apoplexy in an adenoma with anterior pituitary dysfunction and secondary hypocortisolism, initially misinterpreted as bacterial meningitis. Several explanations account for the diagnostic delays and the inaccurate initial diagnosis of acute bacterial meningitis. Although the high temperature was indicative of infection, it can also be a typical finding in pituitary apoplexy associated with secondary adrenal insufficiency [4]. Eye muscle paresis might have been due to the effects of pressure on the cranial nerves secondary to swelling of the pituitary lesion (eg, pituitary abscess); however, this is also a frequently reported and classical finding in pituitary apoplexy [5,6]. In addition, definite diagnosis of a pituitary mass lesion (eg, pituitary abscess and pituitary adenoma with apoplexy) with brain CT or MRI studies is difficult even if hemorrhage is present [5,7].

Table 1 Serum hormone levels in the patient

	Value	Normal value
Cortisol (μg/dL)		
8:00 AM	3	4.3-22.4
4:00 PM	2	3.1-16.7
Free thyroxine (μg/dL)	6.2	4.8-12.5
Thyrotropin (μIU/mL)	0.081	0.35-5.5
Adrenocorticotropic hormone (pg/mL)	<5.0	≤46
Prolactin (ng/mL)	4.53	2.8-29.2
Lutenizing hormone (mIU/mL)	<0.5	0.8-57.3
Follicle-stimulating hormone (mIU/mL)	0.79	0.8-20.9

The most misleading results were the findings of the CSF analysis. The presence of sterile CSF in some cases of pituitary apoplexy is well documented in the current literature [6,8,9]. However, several case reports have noted neutrophilic pleocytosis in pituitary apoplexy that may lead to the misdiagnosis of infectious meningoencephalitis. The abnormal CSF findings could be attributed to the leakage of blood and necrotic tissue from the infracted pituitary gland into the subarachnoid space, which subsequently caused fever, meningeal irritation, and altered consciousness [1]. There are a number of predisposing factors for pituitary apoplexy. Hypertension, head trauma, anticoagulant therapy or bleeding disorders, diabetes, and postpartum hemorrhage may increase the incidence of pituitary apoplexy [5]. Our patient had a history of hypertension and diabetes mellitus, which could have been the predisposing factors for pituitary apoplexy in this case.

The initial management of a patient who presents with pituitary apoplexy includes close observation and, if necessary, the administration of corticosteroid therapy. The timing of surgical decompression is still debatable. Some previous studies advocate urgent decompression of the pituitary fossa, especially when vision is severely affected [5,10]. Others adopt a more conservative approach, especially when progressive neuro-ophthalmological deficit does not exist [11]. Recently, Randeva et al [5] suggested that in

patients with visual field or visual acuity defects, surgical decompression should be performed as soon as possible, preferably within the first week, because this appears to optimize the visual outcome. Although conservative medical management may stabilize a patient's condition, it does not address the underlying pituitary adenoma. Kaplan et al [12] and Onesti et al [13] have also recommended early surgical decompression when ocular paresis and visual disturbance are present, and they achieved good outcomes. Surgical decompression may not only improve the visual outcome and pituitary function but may also prevent recurrent apoplectic episodes or tumor growth. Recurrent apoplexy is well documented in patients who were managed conservatively during their first apoplectic episode. In addition, when there is some debate regarding the initial diagnosis, as in the case of our patient, early surgical decompression can both facilitate accurate pathological diagnosis as well as relieve the pressure on the pituitary mass lesion.

It is important to include pituitary apoplexy in the differential diagnosis of infectious meningoencephalitis and subarachnoid hemorrhage if the patient presents with an acute headache associated with fever, meningeal irritation, and ocular paresis. Rapid and early diagnosis of pituitary apoplexy allows for aggressive endocrine management and neurosurgical decompression, which decreases mortality and morbidity rates from 100% to 6.7% [14]. Thus, the cornerstones of managing pituitary apoplexy include a highly suspicion, appropriate investigations, endocrine replacement therapy, and surgical decompression when required.

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