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A Rare Case of Empty Sella Syndrome Complicated with Pituitary Crisis First Diagnosed at the Department of Gastroenterology and Hepatology

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Abstract: *Empty sella syndrome (ESS) contains serious of symptoms such as intractable headache, pituitary insufficiency, impaired vision and endocrine dysfunctions due to an anatomical condition of empty sella. Pituitary crisis is a critical clinical syndrome characterized by "shock, coma and metabolic disorders". Here we report a rare case of empty sella syndrome complicated with pituitary crisis. The diagnosis was established through hypoglycemia, electrolyte disorders, endocrine dysfunctions and magnetic resonance images. The patient received hormone replacement therapy and the disorders were corrected properly.*

Abbreviations: *ACTH: adrenocorticotropic hormone, CT: computed tomography, ESS: empty sella syndrome, FSH: follicle stimulating hormone, FT_3: free triiodothyronine 3, FT_4: free triiodothyronine 4, HRT: hormone replacement therapy, LH: luteinizing hormone, MRI: magnetic resonance imaging, PPI : proton pump inhibitor, TSH: thyroid stimulating hormone.*

Keywords: *Empty sella syndrome, pituitary crisis, hyponatremia, hypochloremia, hypoglycemia*

1. Introduction

ESS refers to a situation where the pituitary is compressed from herniated cerebrospinal fluid, resulting in secondary symptoms such as intractable headache, pituitary insufficiency, impaired vision, and endocrine dysfunctions [1]. The pituitary crisis is a critical clinical syndrome present with shock, coma, and metabolic disorders, based on original pituitary insufficiency. Early diagnosis is crucial for managing both ESS and pituitary crises. We report a rare case of empty sella syndrome complicated with the pituitary crisis. The report aims to help clinicians improve their ability to recognize the diseases early, especially those not endocrinologists.

2. Case Description

A 47-year-old man visited the emergency department for melena which started five days earlier. He experienced abdominal pain, vomiting, and nausea concurrently. Physical examination revealed lethargy, pale conjunctival mucous membrane, palpebral edema, and anasarca. The patient had a history of coronary heart disease for 13 years and denied a history of trauma or surgery. He was triaged to the department of gastroenterology and hepatology for admission. The patient received intravenous fluid infusion and proton pump inhibitor (PPI) treatment after admission. The hemoglobin level was 88g/L, and biochemical examination showed significant hypoglycemia, hypokalemia,

hyponatremia, and hypochloremia (Table 1). Intravenous glucose supplementation, 0.9% physiological saline solution, concentrated sodium chloride, and potassium chloride infusions were given immediately. However, these disorders have not been improved (Table 1). An abdominal computed tomography (CT) scan showed no significant abnormalities except for hepatolith. These clinical features indicated the possibility of endocrine diseases. An endocrine examination was then performed. In addition to thyroid hormone deficiency, the absence of cortisol and various sex hormones were also observed (Table 2). Decreased FT3, FT4, cortisol, testosterone, estradiol, LH, and FSH suggested impaired functions of the pituitary-gonadal axis, pituitary-thyroid axis, and pituitary-adrenal axis. Magnetic resonance imaging (MRI) showed enlarged sella turcica with long T1 and long T2 cerebrospinal fluid signals and the flattened pituitary gland (Figure 1). By detailly inquiring medical history again, 13 years of poor appetite and loss of libido were complained of. Diagnoses of empty sella syndrome complicated with the pituitary crisis were given according to the above manifestations. The patient was then transferred to the Department of Endocrinology and Metabolism for hormone replacement therapy (HRT). Initially, the patient was given intravenous hydrocortisone 100 mg/day as well as PPI. Melena stopped after the patient was transferred, and the concentration of serum glucose, potassium, sodium, and chlorine recovered significantly after hydrocortisone supplementation treatment for two days (Table 1). Then intravenous hydrocortisone was reduced to 50mg/day, followed by a reduction to an oral dose of 20mg/day (15mg in the morning and 5mg in the afternoon). A low dose of oral levothyroxine (25 μg/day) was then given for thyroxine replacement. The patient was discharged on hydrocortisone (12.5 mg/day) and levothyroxine (25 μg/day) 9 days after being admitted.

Table1. *Biochemical parameters on admission and follow-up*

Analyte	During hospital			Normal range
	Day 1	Day2	Day4 (After HRT)	
serum glucose(mmol/L)	2.47	2.47	5.20	3.90-6.10
potassium(mmol/L)	2.90	2.80	4.50	3.50-5.50
sodium(mmol/L)	116.0	113.0	140.4	135.0-145.0
chlorine(mmol/L)	85.0	84.0	106.4	101.0-111.0

Table2. *Endocrine hormone investigations*

Analyte	Measured value	Normal range
FT_3(pmol/L)	<1.64	2.43-6.01
FT_4 (pmol/L)	<5.15	9.01-19.50
TSH (uIU/mL)	1.4046	0.35-4.94
Cortisol(8:00am)(nmol/L)	12.89	268.94-579.39
Testosterone (ng/mL)	<0.025	2.49-8.36
Estradiol (pmol/L)	27.91	94.8-223
LH (mIU/mL)	0.12	1.7-8.6
FSH (mIU/mL)	0.17	1.5-12.5
ACTH (8:00am)(pg/mL)	2.042	0-40

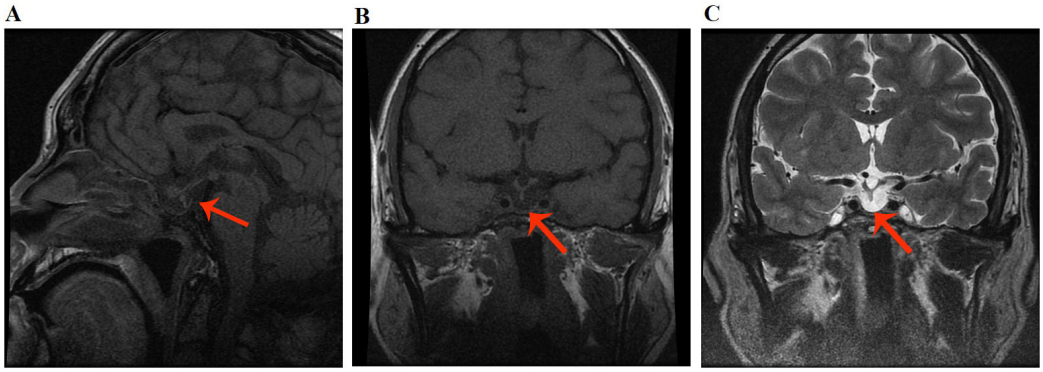

Figure1. *MRI showed Long T1 and long T2 signals in sella turcica and flattened pituitary gland (indicated by the red arrow). (A) the sagittal plane;(B)(C) the coronal plane.*

3. Discussion

Empty sella, first defined by Busch in 1951, refers to an anatomical condition characterized by the sella turcica wholly or partially filled with cerebrospinal fluid resulting in a displacement of the normal pituitary gland [2,3]. Empty sella syndrome (ESS) contains a series of clinical manifestations such as intractable headache, pituitary insufficiency, impaired vision, and endocrine dysfunctions, which occur due to the presence of empty sella[1]. Pituitary crisis, also known as acute pituitary insufficiency, is a clinical syndrome characterized by "shock, coma and metabolic disorders" based on original pituitary insufficiency. It is usually stimulated by stress conditions such as infection, trauma, and dehydration [4].Cases of ESS complicated with pituitary crisis are uncommon in clinical practice.

In addition to searching for primary diseases, the treatment principle for both ESS and pituitary crisis also includes hormone replacement, such as supplementing glucocorticoids and thyroid hormones [5]. Hydrocortisone is the first choice for glucoco- rticoids. Levothyroxine sodium tablets are usually used for thyroid hormone supplementation. However, it should be noted that adrenocortical hormone should be applied before thyroid hormone supplementation. It is because if thyroid hormone were supplemented first, it would inhibit the secretion of adenohypophyseal hormone and aggravate the lack of glucocorticoid. At the same time, the thyroid hormones' metabolic effect can promote glucocorticoids' metabolism, thereby worsening the adrenal cortex crisis.

Other treatments include injection of glucose, physiological saline solution, and concentrated sodium chloride to correct hypoglycemia, hyponatremia, and hypochloremia. Hypothermic patients should keep warm, and antibiotics should be used if there is a shock. Surgery is necessary when patients have severe intracranial hypertension and nerve compression symptoms[6].

4. Conclusions

Among many factors that affect ESS and pituitary crisis management, the most important is early diagnosis. A medical history of trauma or pituitary tumor, hypotension or shock on physical examination, or laboratory examination indicating hypoglycemia, hyponatremia and low pituitary hormone level are all important clues for rapid diagnosis. HRT and symptomatic treatment should be given immediately once the diagnosis is confirmed.

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References

[1] Chiloiro S, Giampietro A, Bianchi A, De Marinis L. Empty sella syndrome: Multiple endocrine disorders. Handb Clin Neurol.2021; 181:29-40.

[2] Busch W. Die Morphologie der Sella turcica und ihre Beziehungenzur Hypophyse. Virchows Arch Pathol Anat Physiol Klin Med.1951; 320(5):437-458.

[3] Lenz AM, Root AW. Empty sella syndrome. Pediatr Endocrinol Rev. 2012; 9(4):710-5.

[4] Jain S , Aggarwal R , Sud R, Jain N. Abstract #805 Acute on Chronic Pituitary Insufficie ncy– A Near Fatal Miss. EndocrPract.2018; 24:173-174.

[5] Alexandraki KI, Grossman A. Management of Hypopituitarism. J Clin Med.2019;8(12):2153

[6] Fouad W. Review of empty sella syndrome and its surgical management. Alex J Med.2011;47(2):139-147.

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