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CASE REPORT

Differential diagnosis between pituitary tumor apoplexy and pituitary abscess – case report

Ligia Tataranu[1,2], Vasile Ciubotaru[2], Adriana Dediu[1,2]

[1]"Carol Davila" University of Medicine and Pharmacy, Faculty of Medicine, Department of Neurosurgery, Bucharest, Romania

[2]Third Department of Neurosurgery, Emergency Clinical Hospital "Bagdasar-Arseni", Bucharest, Romania

ABSTRACT

BACKGROUND. Clinical diagnosis in pituitary abscess is difficult and can be indistinguishable from other pituitary lesions. This pathology is rather characterized by long-standing headaches, a raised erythrocyte sedimentation rate and increased white blood count with endocrinology tests suggestive for hypopituitarism. A history of paranasal sinusitis and/or immunosuppressed status can be also present.

CASE REPORT. A 16 years old girl was admitted to our neurosurgery department with sudden onset of headache, nausea, vomiting, decreasing visual acuity, nuchal rigidity and photophobia. Bilateral papilledema was seen on funduscopic examination. The endocrinological status was normal. MRI of the head revealed a sellar-suprasellar mass that was centrally isointense with peripheral hyperintensity on T1–weighted images and iso-hyperintense with peripheral hyperintensity on T2-weighted images. After the administration of gadolinium, rim enhancement was seen. Treatment of choice for pituitary abscess in this case was surgical drainage of the pituitary area via transsphenoidal approach and broad spectrum antibiotic therapy with Ceftriaxone and Metronidazole for three weeks. On the head MRI scan one month after surgery, there were no signs of pituitary tumor or recurrent pituitary abscess. The patient had no endocrinological dysfunction and the visual acuity was normal.

CONCLUSION. Pituitary abscess is a rare pathology, with a high mortality rate. It is difficult to distinguish abscess from other sellar masses, and the abscess should be considered in the differential diagnosis of the pituitary lesions. After a prompt diagnosis, the surgery and antibiotic therapy should be established rapidly. The prognosis is excellent with an aggressive therapy, which implies surgery, antibiotics and hormone replacement.

KEYWORDS: pituitary abscess, pituitary apoplexy

INTRODUCTION

The clinical syndrome characterized by severe headache with sudden onset, nausea, meningismus, visual deterioration, ophthalmoplegia, restriction of visual field, partial or complete pituitary failure and impaired consciousness in a patient with a sellar mass is strongly suggestive for pituitary apoplexy[1].

Signs and symptoms of pituitary tumor apoplexy are generally consequent to an infarct or hemorrhagic event. Cranial nerves are compressed from lateral or superior extension of necrotic and/or hemorrhagic material. Subarachnoid extravasation of blood and dural irritation appear sometimes. Endocrine abnormalities are caused by acute pituitary dysfunction[1,2].

This clinical syndrome is not characteristic for pituitary apoplexy and may appear in other pituitary pathologies.

Clinical diagnosis in pituitary abscess is difficult and can be indistinguishable from other pituitary lesions. This pathology is rather characterized by long-standing headaches, a raised erythrocyte sedimentation rate and increased white blood count with endocrinology tests suggestive for hypopituitarism. A history of paranasal sinusitis and/or immunosuppressed status can be also present[3].

Corresponding author: Ligia Tataranu, MD, PhD, Assoc. Prof. "Carol Davila" University of Medicine and Pharmacy Bucharest
email: medic@neurochirurg.ro

In this study we highlight the importance of the differential diagnosis. We also emphasize the necessity of surgical exploration and histopathological examination for a correct final diagnosis. It is a difficult process, but required for an appropriate treatment.

CASE REPORT

A 16 years old girl was admitted to our neurosurgery department with sudden onset headache, nausea, vomiting, decreasing visual acuity, nuchal rigidity and photophobia. At admission, she had no fever or decreased level of consciousness. The patient presented no history of paranasal sinusitis or other infections, no immunosuppressive diseases.

Evaluation. The patient was conceit, without sensory or motor deficit. Blood pressure was 120/60 mmHg, and the pulse rate 80 beats/min. Ophthalmological examination revealed a reduced visual acuity of both eyes; there were no visual field defects. Bilateral papilledema was seen on funduscopic examination.

A contrast-enhanced **magnetic resonance imaging** of the head was performed and it revealed a 1.2 x 2.7 x 2.4 cm sellar-suprasellar mass that was centrally isointense, with peripheral hyperintensity on T1 - weighted images and iso-hyperintense with peripheral hyperintensity on T2 - weighted images. After the administration of gadolinium, rim enhancement was seen. The lesion had close contact with both cavernous sinuses. The optic chiasm was displaced upward (Figure 1).

Results of the hematological and biochemical tests showed just a raised erythrocyte sedimentation rate with leukocytes in normal range.

The **endocrinological status** was normal.

Based on the admission signs and symptoms (the presence of meningism, the absence of fever), the ophthalmological examination and the MRI imaging, a diagnosis of pituitary tumor apoplexy was considered to be most likely.

Surgical approach. A transnasal transsphenoidal approach was performed promptly. The mucosa of the sphenoidal sinus was normal. The sellar floor was intact and thin. After the sellar floor was removed and the dura was opened, a creamy, non-odorous, yellow fluid oozed out. There was no evident capsule. The pus was immediately sent for Gram staining and bacteria cultures. After the sellar abscess was evacuated, an intrasellar mass was removed and sent to histopathological examination. The sellar cavity was washed out repeatedly with hydrogen peroxide, sodium chloride solution and finally with gentamicin.

Gram stain of the pus revealed polymorph nuclear cells and Gram-positive cocci.

The aerobic and anaerobic cultures were sterile.

The histopathological study showed an infiltrative mixed pituitary adenoma and inflammatory cells suggestive of an infectious process. The final diagnosis was abscess formation within invasive pituitary adenoma, so the diagnosis of pituitary apoplexy was ruled out.

After the operation, broad spectrum antibiotic therapy with Ceftriaxone and Metronidazole was started and administrated for three weeks.

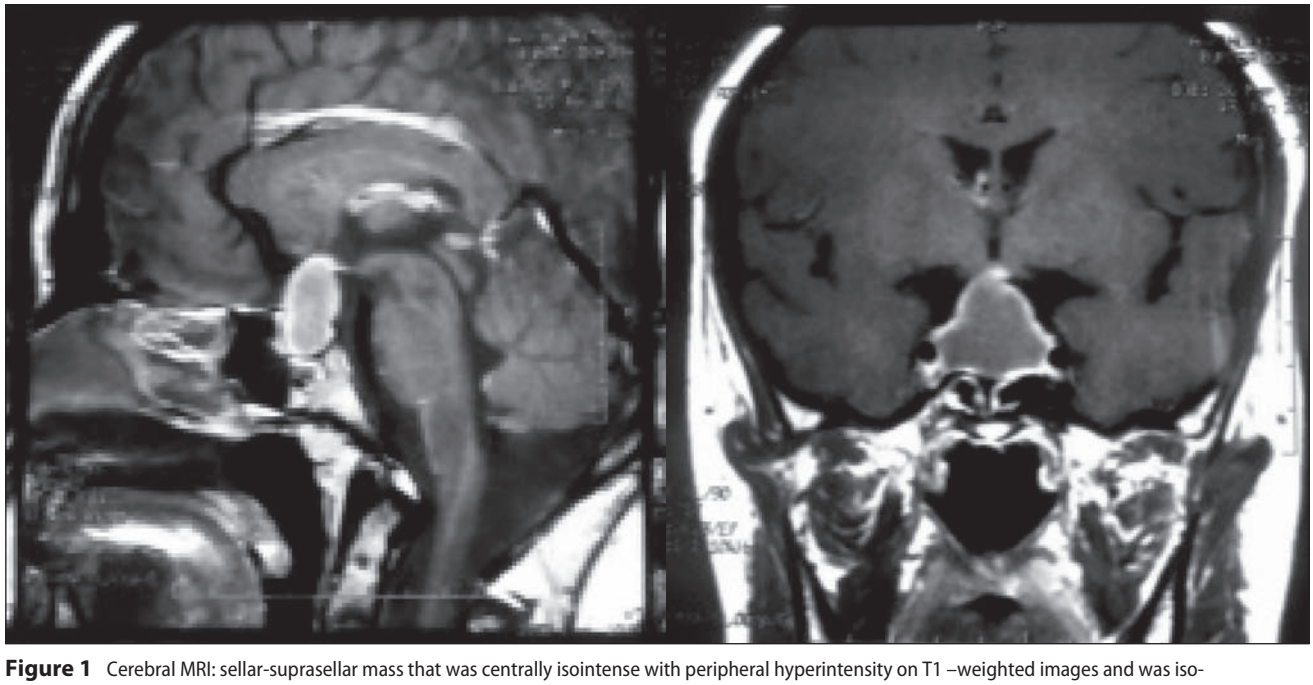

Figure 1 Cerebral MRI: sellar-suprasellar mass that was centrally isointense with peripheral hyperintensity on T1 –weighted images and was iso-hyperintense with peripheral hyperintensity on T2-weighted images. After the administration of gadolinium, rim enhancement was seen

The next day after surgery we noted the progressive improvement of visual acuity, while meningeal reaction, headache, nausea and vomiting disappeared.

Two days after surgery we found a cutaneous rash highly suggestive for varicella. The patient was transferred the same day to the Infectious Diseases Clinic, in good condition, with recovered visual acuity and recommendation to continue the antibiotic therapy.

One month after, the **magnetic resonance imaging** of the head showed no signs of pituitary tumor or recurrent pituitary abscess (Figure 2). The patient had no endocrinological dysfunction and visual acuity was normal.

DISCUSSIONS

We report a case of a young girl with sudden onset headache, nausea, vomiting, decreasing visual acuity, nuchal rigidity and photophobia, secondary to a pituitary lesion. With no prior infectious diseases history, we considered it a case of pituitary tumor apoplexy, but it proved to be a pituitary abscess.

Pituitary abscess is a rare pathology, representing less than 1% of all pituitary diseases and approximately 0.27% of all operated pituitary tumors[4].

Tuazon and Labriola demonstrated in a review of 37 cases of pituitary abscess a wide age variation - from 12 to 69 years of age. This disease is more frequent in women, especially young ones, aged between 15 and 20[5].

Pituitary abscess can be divided in two categories: primary and secondary. About 66% are primary and occur within a healthy gland. Approximately 33% are secondary and arise within a pre-existing lesion, such as adenomas, craniopharyngiomas and Rathke's cleft cysts[6,7,8]. A number of factors have been identified as being involved in the development of an abscess in a pituitary adenoma, including local immunological impairment, impaired circulation and necrosis in the adenoma[9].

Papers from the early 20th century considered that chronic hypophyseal inflammation could be determined by a metastatic spread from a generalized sepsis, meningitis, sinusitis, sphenoid osteomyelitis or thrombophlebitis of the cavernous sinus[10-12].

A number of systemic factors may predispose to the development of pituitary abscess, like AIDS, chemotherapy, hematological malignancy, organ transplant and other acquired or familial immunodeficiency[13]. All these pathologies were absent in our case.

The clinical signs and symptoms of pituitary abscess are very similar to those of pituitary adenoma, craniopharyngioma or other pituitary lesions. Symptoms may progress over a period of months or years before the diagnosis is made. Headache appears in about 90% of all cases, frequently bifrontal. It is due to the distortion of the diaphragma sellae or the irritation of the parasellar dura. Compression of the optic nerves determines the visual disturbance, especially impaired visual acuity and bitemporal hemianopsia. Endocrine dysfunctions, such as amenorrhea, hypothyroidism, polydipsia and polyuria are frequently found in patients with pituitary abscess. About 50% of the patients with pituitary abscess have diabetes insipidus[14]. Specific for our case, the symptoms had a rapid onset and there was no endocrine dysfunction.

A history of meningitis, sinusitis or rhinorrhea should be investigated for a source[6]. Our patient had no such history.

The biochemical and hematological findings of pituitary abscess are not characteristic of this pathology. Blood investigation may show a raised erythrocyte sedimentation rate and increased number of leukocytes.

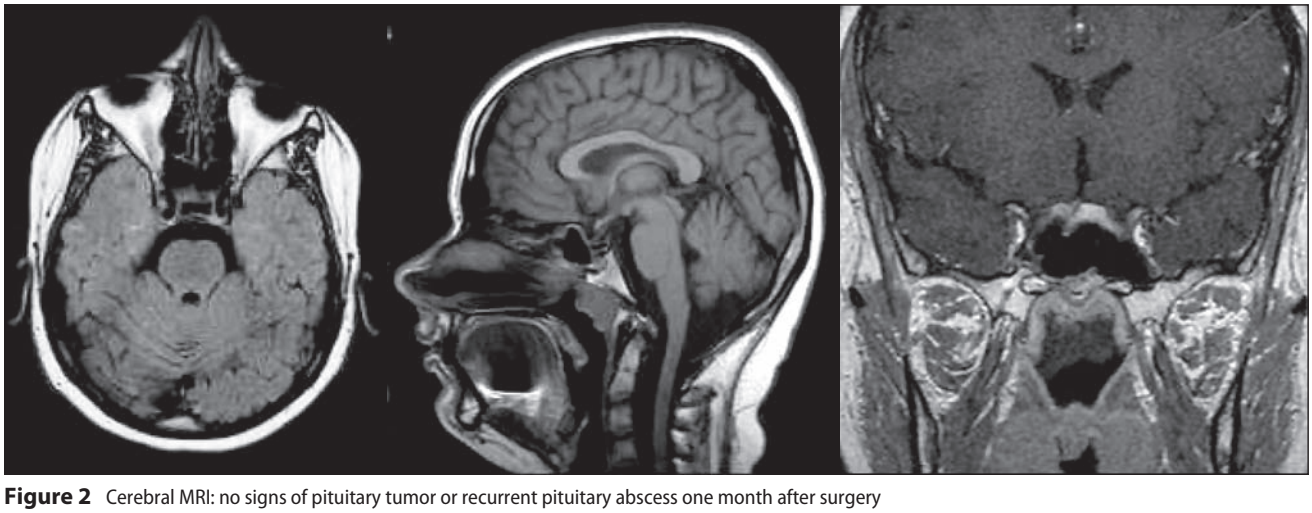

Figure 2 Cerebral MRI: no signs of pituitary tumor or recurrent pituitary abscess one month after surgery

Frequently, plain X-ray may show sellar enlargement or erosion of the dorsum sella. In our case, the sella turcica has a normal aspect. On computed tomography, pituitary abscess appears as a homogenous low density mass. MRI aspect of pituitary abscess is not a particular one; it tends to be high signal on T2-weighted images, and it usually appears as a hypo-isointense sellar mass on T1-weighted images. A peripheral contrast enhancing rim is present in most cases[6].

Diagnosis of pituitary abscess by cultures of abscess material can also be difficult. The most common microorganisms are *streptococci*, *staphylococci*, *pneumococci*, *Klebsiella*, *Proteus*. In rare cases, *Aspergillus*, *Candida* and *Salmonella* typhi have been identified as causative organisms[6,10].

After the diagnosis of pituitary abscess is made, the surgical procedure should be performed immediately. For this pathology, we can use the transsphenoidal approach or transcranial approach. Treatment of choice for pituitary abscess is the surgical drainage of the pituitary area via transsphenoidal approach. The transsphenoidal approach is considered a better choice, because it provides a prolonged drainage of the sella, decompression of the optic chiasma and management of a possible sinusitis. The transcranial approach assumes an increased risk of CSF contamination and meningoencephalitis[6,14].

Broad-spectrum antibiotic therapy must be initiated as soon as the diagnosis of pituitary abscess is confirmed. After identification of the organism, a specific antibiotic therapy should be continued for two to eight weeks. The optimal period of treatment is not exactly known[3,6,14].

Endocrinopathy is frequently found in patients with pituitary abscess, so hormonal replacement is needed (particularly corticosteroids). Our patient had a normal hormonal status and the hormonal therapy was not necessary.

Mortality in pituitary abscess is about 30%, but it can rich 50% for an untreated pituitary abscess associated with large pituitary tumor or meningitis. The mortality rate of a pituitary abscess with *Aspergillus* can be extremely high, close to 100%[6].

The prognosis for pituitary abscess is very good with the appropriate treatment. Neurological and endocrinological outcome are also good, with strong potential for recovery of the normal visual and hormonal functions[14,15].

CONCLUSIONS

Pituitary abscess is a rare pathology, with a high mortality rate. It is difficult to distinguish abscess from other sellar masses, and the abscess should be considered in the differential diagnosis of the pituitary lesions. After a prompt diagnosis, the surgery and antibiotic therapy should be established rapidly. The prognosis is excellent with an aggressive therapy, which implies surgery, antibiotics and hormone replacement.

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