CASE REPORT

Pituitary apoplexy syndrome as the manifestation of intracranial tuberculoma

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SUMMARY

Pituitary apoplexy syndrome is characterised by acute neuro-ophthalmological features and usually occurs due to bleeding in a pituitary adenoma. It is an unusual presentation of tuberculoma, as only few similar cases have been reported previously. A 17-year-old girl presented with headache, vomiting, altered sensorium and vision loss. MRI of the brain revealed ring enhancing sellar lesions with other enhancing lesions and leptomeningeal enhancement. Cerebrospinal fluid microscopy, biochemistry and PCR for tuberculosis confirmed tubercular meningitis. The patient was treated with antituberculous therapy and was asymptomatic at the end of treatment.

BACKGROUND

Central nervous system tuberculosis (CNS-TB) is one of the most devastating forms of tuberculosis (TB). It usually occurs due to the haematogenous spread of *Mycobacterium tuberculosis* from a primary focus, which is pulmonary in most cases. It occurs in about 10% of people suffering from tuberculosis. The various forms of CNS-TB include tuberculous meningitis (TBM), tuberculous encephalopathy, tuberculous vasculopathy, tuberculomas, tuberculous abscess, spinal tuberculosis and tuberculous arachnoiditis.¹ TBM is the commonest form of CNS-TB. It is characterised by an intense inflammatory process affecting the meninges, which may lead to obstruction of cerebrospinal fluid (CSF) flow and its resultant complications. TBM may also be associated with vascular involvement and brain infarction. Recently, drug-resistant TBM is being increasingly reported and is becoming an important concern for developing nations.²

Intracranial tuberculomas are granulomatous lesions, spherical in shape, measuring about 2–8 cm in diameter.¹ However, the shape may be irregular and the lesions may be conglomerated in many cases, in contrast to neurocysticercosis. Tuberculomas occur due to the spread of mycobacteria to the brain parenchyma, where they form a focal granuloma with central necrosis. They constitute about one-third of the intracranial space occupying lesions in developing countries.³ Tuberculomas are commonly located in the cerebral hemispheres, basal ganglia, brainstem, cerebellum and subarachnoid space. However, tuberculomas are an unusual cause of a pituitary mass. Sellar tuberculomas are rare, and until now very few cases have been reported in the world literature with varied presentations.

Pituitary apoplexy is an emergency condition which occurs due to infarction of the pituitary or haemorrhage within the gland. The acute clinical manifestations occur due to the local mass effect, spread of blood in the subarachnoid space and deficiency of pituitary hormones.⁴ The main clinical features of pituitary apoplexy syndrome are headache, visual impairment, external ophthalmoparesis, meningismus, altered sensorium and hormone deficiencies.⁵ The usual causes of pituitary apoplexy are infarction and bleeds within the pituitary adenoma or, rarely, metastases.⁶ However, pituitary tuberculoma is an extremely unusual aetiology of pituitary apoplexy syndrome.

We report pituitary apoplexy-like presentation of sellar region tuberculoma in a 17-year-old girl. She was started on antituberculous treatment (isoniazid, rifampin, pyrazinamide and streptomycin for 3 months; followed by isoniazid and rifampin for 6 months). The patient showed a favourable clinical response to treatment.

CASE PRESENTATION

A 17-year-old girl was admitted with a history of sudden onset headache and vomiting followed by severe bilateral vision loss and altered sensorium. The headache of 10-day duration was of moderate intensity, holocranial and of pulsatile nature. It was followed by 3–4 episodes of vomiting per day which was projectile in nature. Vision loss started simultaneously with the above symptoms and was acute, bilateral, severe, painless and non-progressive. She did not report having double vision. A week after the onset of illness, the patient became drowsy and went into a state of depressed sensorium. There was no history suggestive of any cranial nerve deficit or bladder-bowel dysfunction. The patient had no history of trauma. However, there was a history of intermittent, low-grade fever for 2 weeks prior to the presenting illness.

On examination, the pulse rate was 96/min and blood pressure was 110/74 mm Hg. The patient was drowsy, disoriented and not responsive to commands. Her Glasgow Coma Scale score was 8/15 (eye opening: to painful stimulus, motor response: withdrawal in response to pain, and verbal response: incomprehensible speech). Bilateral papilloedema was noted on funduscopy. She was moving all four limbs. Deep tendon reflexes were normally elicitable and plantars were bilateral extensor.

INVESTIGATIONS

The patient's routine haematological and biochemical investigations were within normal limits. Her

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Figure 1 Sagittal T1-weighted contrast MRI showing multiple contrast enhancing lesions. The solid arrow points to suprasellar tuberculoma, whereas the empty arrow shows sellar tuberculoma. The sellar tuberculoma is seen to fill the entire sella turcica, and the normal pituitary is not visible.

chest radiograph was normal and sputum smear examination for acid-fast bacilli was negative. MRI of the brain is depicted in figures 1–4. In figure 4, the enlargement of the fourth ventricle shows that the patient had communicating hydrocephalus. Leptomeningeal enhancement was also seen in the presence of hydrocephalus. Hormonal assays of the patient showed serum prolactin level 9.64 ng/mL (normal 2.1–17.7), serum growth hormone 1.6 ng/mL (normal 2.1–17.7), thyroidstimulating hormone 11.25 mIU/mL (0.35–5.5), triiodothyronine 87.3 ng/dL (60–200) and thyroxine 5.8 mg/dL (4.5–12). CSF analysis showed 240 cells/mm³, of which 85% were lymphocytes and

Figure 2 Sagittal T1-weighted contrast MRI focusing on the sellar mass (solid arrow), which is comprised of contrast enhancing, and conglomerated tuberculomas which are also seen to compress the upper brainstem. Contrast enhancement is also seen in the local basal meninges.

Figure 3 Coronal T1-weighted contrast MRI showing the contrast enhancing sellar and suprasellar mass (blue arrow), along with the hydrocephalus, which is demonstrated by the enlargement of lateral ventricles (solid white arrows), enlargement of the third ventricle (empty white arrow), opening and enlargement of the temporal horns of lateral ventricles (arrowheads).

Figure 4 Axial T1-weighted contrast MRI at the level of pons, showing sellar tuberculomas (blue arrow), opening and enlargement of temporal horns of lateral ventricles (solid white arrows) and enlargement of the fourth ventricle (empty white arrow).

15% were neutrophils. Gram staining, Ziehl-Neelsen staining and Indian ink preparation for cryptococci were negative. CSF protein levels were 196 mg/dL, sugar 45 mg/dL and chloride 118 mEq/L. PCR for tuberculosis (TB-PCR) was positive in the CSF. Thus, based on clinical features, neuroimaging and investigations, a diagnosis of pituitary tuberculoma with pituitary apoplexy syndrome was made. It took 7 days for the results of TB-PCR to be available. However, we had started antituberculous therapy (ATT) based on the clinical picture, MRI findings along with CSF microscopy and biochemistry results, which pointed towards the diagnosis of tuberculous meningitis with sellar tuberculomas.

DIFFERENTIAL DIAGNOSIS

The differential diagnoses of this patient were as follows:

- ▶ Pituitary haemorrhage: MRI in our patient did not show any evidence of pituitary haemorrhage. Furthermore, the CSF was negative for red blood cells, making a diagnosis of pituitary haemorrhage less likely.
- ▶ Pituitary adenoma: Bleeding within a pituitary adenoma is a common cause of pituitary apoplexy syndrome. However, the absence of a solid pituitary mass lesion ruled out the presence of pituitary adenoma.
- ▶ Cryptococcal infection: Cryptococcal CNS infection may lead to intracranial cryptococcomas. However, such lesions rarely involve the pituitary. In our patient, CSF microscopy with Indian ink preparation did not reveal any cryptococci.
- ▶ Bacterial meningitis: Possibility of bacterial meningitis was ruled out on the basis of CSF examination.
- ▶ Pituitary metastases: The CSF and MRI pictures were not in favour of pituitary metastasis.
- ▶ Dermoid cyst, lymphoma, germinoma and aneurysm: These lesions were excluded by MRI findings of conglomerated ring enhancing lesions suggesting tuberculoma.

TREATMENT

The patient had presented with features of raised intracranial pressure (ICP). She was treated with intravenous mannitol and oral acetazolamide. The features of raised ICP improved over 1 week. She was immediately started on ATT with isoniazid 5 mg/kg body weight; rifampicin 10 mg/kg body weight; pyrazinamide 25 mg/kg body weight and streptomycin 15 mg/kg body weight along with pyridoxine supplementation (20 mg/day) for 3 months followed by isoniazid and rifampin for 6 months. In addition, she also received dexamethasone for 6 weeks. The patient's urine output was about 1500 mL/day and she did not require antidiuretic hormone supplementation.

OUTCOME AND FOLLOW-UP

The patient showed gradual improvement in sensorium and vision in the first week during hospitalisation and was asymptomatic at the end of an intensive phase of antituberculous chemotherapy. She received ATT for 9 months.

DISCUSSION

The most common cause of a pituitary mass is a pituitary adenoma. Other causes include a pituitary haematoma, Rathke's cyst, histiocytosis or granulomatous disorders.⁷ Tuberculoma is an uncommon cause of a pituitary mass. Although intracranial tuberculomas are quite common, pituitary tuberculoma is an unusual condition, even in endemic countries like India. Coleman and Meredith⁸ had reported the first case of pituitary tuberculoma, and Sharma *et al*⁹

presented a series of 18 cases of pituitary tuberculoma. Radiologically, it is difficult to differentiate this condition from pituitary adenoma. However, in our case, the presence of other ring enhancing lesions, leptomeningeal enhancement, hydrocephalus and a CSF picture suggesting tuberculous meningitis pointed towards diagnosis of pituitary tuberculoma. The bacteriological diagnosis of tuberculous meningitis is made on the basis of CSF microscopy (showing lymphocytic pleocytosis and increased proteins), CSF culture for *M tuberculosis* and CSF TB-PCR. However, the results of CSF culture are obtained after 4–6 weeks and the culture may not be positive in many cases, as CNS-TB is a paucibacillary disease. The sensitivity and specificity of CSF PCR for the diagnosis of *M tuberculosis* meningitis have been observed to be 50% and 98.6%, respectively.¹⁰ Hence, in such cases, empirical treatment with antituberculous drugs is usually started, without waiting for the results of TB culture and TB-PCR.

On MRI, pituitary tuberculoma appears as an isointense mass on T1-weighted (T1W) and T2W images with heterogeneous areas. Contrast enhancement can be uniform, heterogeneous or a peripheral rim-like enhancement is described. The non-enhancing areas consist of foci of caseous necrosis. Thickening and enhancement of the pituitary stalk may also be demonstrated.¹¹ However, features such as presence of simultaneous ring enhancing lesions, meningeal contrast enhancement and non-communicating hydrocephalus help to differentiate pituitary tuberculoma from adenoma.

Presentation of pituitary tuberculoma with a 'pituitary apoplexy'-like clinical picture is rare, with only few cases being reported previously.^{12–13} Pituitary apoplexy syndrome, which is seen in about 8–10% of pituitary adenomas, usually occurs due to infarction or haemorrhage in the adenoma and presents with vision loss, ophthalmoplegia, impaired mentation, meningismus and endocrinal abnormalities.⁵ Acute management of pituitary apoplexy should be initially focused on assessment and maintenance of fluid and electrolyte balance and maintaining haemodynamic status of the patient. Acute deficiency of adrenocorticotrophic hormone may lead to a steroid deficient state which should be corrected by steroid replacement therapy. Decongestant therapy should be given if the patient shows signs of raised ICP. Indications for surgery include vision loss and ophthalmoparesis due to involvement of the third, fourth or sixth cranial nerves.¹⁴

The cause of such presentation in a pituitary tuberculoma can be due to inflammatory vasculitis within the lesion, causing either infarction or bleeding.¹² Similar to other cases of pituitary apoplexy, surgery is indicated for decompression and relief of neuro-ophthalmic features and also for diagnostic purposes.

Learning points

- ▶ Tuberculoma is an unusual cause of sellar mass and should be considered in the differential diagnosis of sellar masses.
- ▶ Tuberculoma may be radiologically indistinguishable from a pituitary adenoma.
- ▶ Ring enhancement, thickening and enhancement of the pituitary stalk and leptomeningeal enhancement help to distinguish between pituitary tuberculoma and adenoma.
- ▶ Pituitary apoplexy-like presentations can occur with tuberculoma and warrant a high index of clinical suspicion.

A transsphenoidal surgery is preferred.¹³ A surgery may help to restore vision and relieve external ophthalmoparesis by reducing the compression over the optic nerve and ocular motor nerves. It also serves diagnostic purposes by obtaining tissue for histopathological diagnosis in cases where the diagnosis is not certain. However, our patient was treated conservatively and responded to ATT.

Contributors RV formulated the hypothesis and the other authors helped in the drafting of the manuscript.

Competing interests None.

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