

# Suprasellar tubercular abscess presenting as panhypopituitarism: A common lesion in an uncommon site with a brief review of literature

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**Abstract** Following widespread use of imaging, detection rate of abnormal sites of parenchymal neuro-tuberculosis is on a rise. A handful of cases of tuberculomas/abscesses in hypothalamo-pituitary region have been reported and most of them are diagnosed on surgical histopathology. We describe a patient of suprasellar tubercular abscess, who presented with visual disturbances, diabetes insipidus with panhypopituitarism and on histopathology had granulomas and positive acid fast bacilli.

**Keywords** Neurotuberculosis · Panhypopituitarism

## Introduction

The incidence and severity of all forms of tuberculosis has decreased with improved standards of living, vaccination, early diagnosis and effective chemotherapy [1]. With the advent of better imaging modalities, diagnosis of smaller lesions, abnormal and peculiar forms of tuberculomas/abscesses is increasing. Tuberculomas in the hypothalamo-pituitary region are not rare as reported in various necropsy series [2, 3]. However, surgically verified sellar and suprasellar tubercular abscess, either as isolated manifestation with pressure symp-

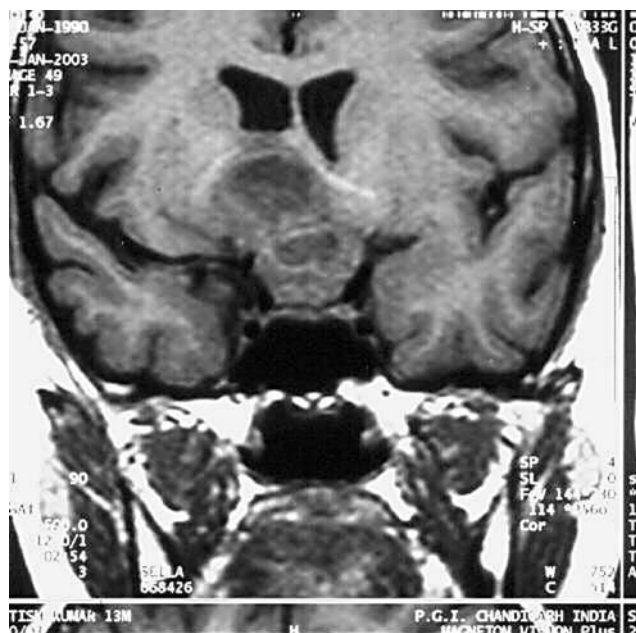
toms, or with panhypopituitarism is rare. We discuss a case of suprasellar tubercular abscess teeming with acid fast bacilli that presented as diabetes insipidus with panhypopituitarism.

## Case report

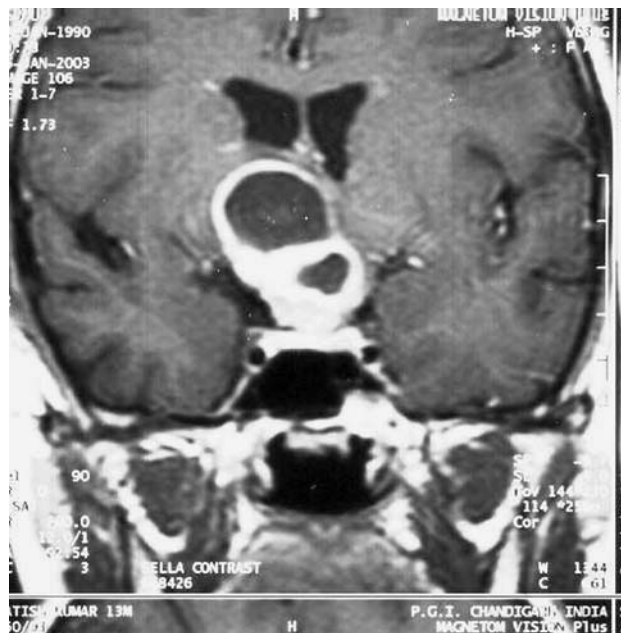
A 13-year-old boy presented with acute meningitic illness which was treated elsewhere as ‘acute pyogenic meningitis’ but had no improvement. He presented to us with headache, diminution of vision and polyuria. He also had decreased appetite and cold intolerance of unspecified duration. On examination, the child was drowsy, febrile and had a BP of 100/60 mmHg. His right pupil was dilated with sluggish reaction to light but perception of light was present. The left eye had visual acuity of 6/18 with loss of temporal field of vision. Both the optic disc were pale. He had features of arrested puberty (A<sub>2</sub> P<sub>2</sub>, testicular volume, 4 ml). Other systemic and general physical examination was unremarkable. On investigations CSF fluid analysis revealed lymphocytic pleocytosis, low glucose and high adenosine deaminase (ADA). Mantoux test was strongly positive (25 × 25 mm) with purified protein derivative. Chest radiograph was normal. MRI brain revealed complex solid-cystic mass lesion measuring 4 × 3.3 × 2 cm in the suprasellar region involving hypothalamus, optic chiasm and the right temporal lobe (Figs. 1 and 2). The pituitary stalk was thickened. Serum T<sub>3</sub> was 0.7 ng/ml (N 0.6–1.6), T<sub>4</sub> 2.5 μg/dl (N 4.5–14), TSH 3.4 μIU/ml (N 0.5–5.5), LH 1.56 mIU/ml (N 0.5–5.5), FSH 2.5 mIU/ml (N 5–15), testosterone 3.1 nmol/L (N 9–27), cortisol (0800 h) 98 nmol/L (N 400–600); Peak growth hormone level after insulin hypoglycemia was 2 ng/ml (N > 10). Water deprivation test confirmed central diabetes insipidus. He underwent stereotactic aspiration and biopsy of the suprasellar lesion. It revealed pus which was strongly positive for acid fast bacilli on Ziehl-Neelsen staining

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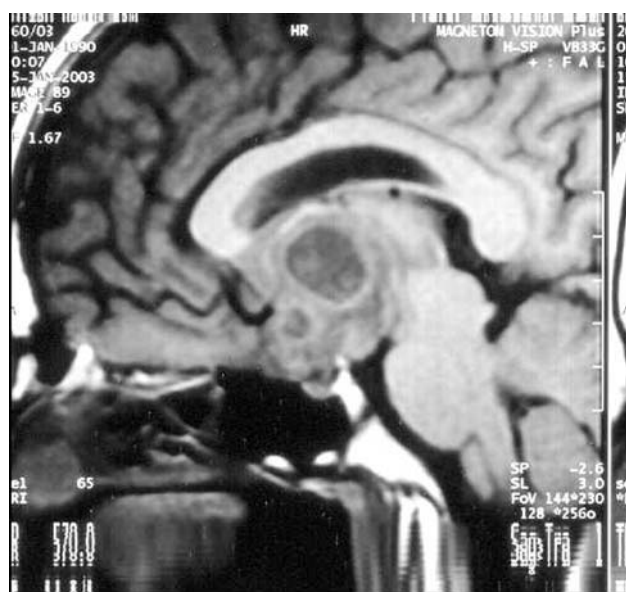
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(a)



(a)



(b)



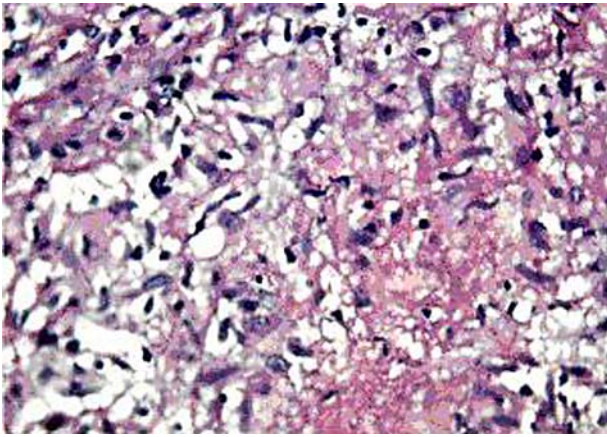
(b)

**Fig. 1** Coronal (a) and sagittal (b) precontrast section shows heterogenous suprasellar lesion with central hypointensity and peripheral heterogenous isointensity. The pituitary gland is separately seen (arrowed portion in 1b)

and ill-formed granulomas, and vascularised granulation tissue infiltrated with acute and chronic inflammatory cells (Figs. 3 and 4). He was put on L-thyroxine, desmopressin nasal spray 10  $\mu$ g/day, and antitubercular therapy in the form of isoniazid, rifampicin, ethambutol and pyrazinamide. He received dexamethasone in doses of 4 mg q6 hourly intravenously for a week as anti-inflammatory as well as replacement therapy. Later he was shifted to prednisolone. After 2

**Fig. 2** Coronal (a) and sagittal (b) post-contrast section shows marked enhancement of the peripheral solid part and non-enhancing central liquefied area

weeks, he had marked improvement in vision (visual acuity of 6/9 on the right side and 6/6 on the left side). He was discharged a month later. At 6 months of follow-up, repeat MRI of brain showed marked reduction in the size of the lesion. Subsequently he was lost to follow up and was reported to have died probably because of cessation of steroids.

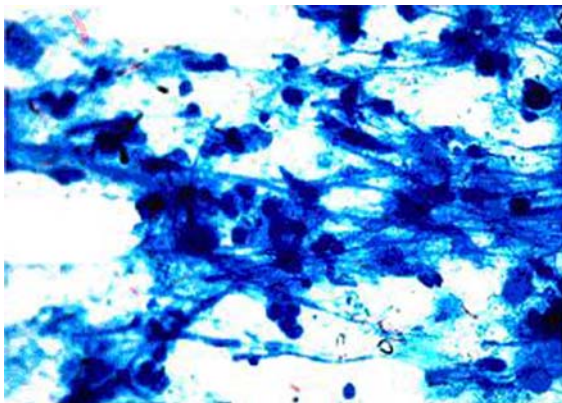


**Fig. 3.** High power photo micrograph ( $\times 440$ ) showing necrotic material, acute inflammatory cells and ill formed granuloma

### Discussion

We have described a patient who presented as ‘acute meningitic’ illness with features of anterior pituitary dysfunction and diabetes insipidus. MR imaging showed a suprasellar cystic mass and histology confirmed granulomatous lesion with positive acid fast bacilli consistent with tuberculosis.

Tuberculomas/tubercular abscesses in the hypothalamo-pituitary region are extremely rare [2–4,17]. The usual presenting symptoms are headache, fever, diminution of vision and/or field defects, infrequently overt anterior pituitary dysfunction and rarely diabetes insipidus. Occasionally suprasellar tubercular abscess can present as ‘acute meningitic illness’. An analysis of compiled data of 20 cases of tuberculoma/ tubercular abscess showed that headache (85%) and visual symptoms (50%) were the most common presenting manifestations. More than half of the patients (60%) had anterior pituitary dysfunction and only 10% had diabetes insipidus (Table 1). Our patient presented as an acute meningitic illness with concurrent features of panhypopituitarism



**Fig. 4.** Ziehl-Neelsen staining showing acid fast bacilli in a background of necrotic material and acute inflammatory cells

and diabetes insipidus. Of the 20 patients of tuberculoma/ tubercular abscess, fifteen (75%), had suprasellar extension (5 with suprasellar and 10 with both sellar and suprasellar component), two were confined to sella only and in three details were not available.

The differential diagnosis of a suprasellar mass in an adolescent includes craniopharyngioma, germinoma, Rathke’s cyst, glioblastoma and rarely tuberculoma [13–15]. These possibilities are further narrowed down if the lesion has a solid-cystic component. Lack of calcification in the lesion makes the possibility of craniopharyngioma less likely. Infundibular thickening, perilesional edema, thick septae of cystic wall and acute meningitic like illness are strong indicators of a tuberculous etiology. Stereotactic biopsy is not routinely recommended to establish the etiological diagnosis of suprasellar mass. However, because of above mentioned features in our patient, cyst fluid aspiration and biopsy was performed. Biopsy showed ill formed granulomas with infiltration of chronic inflammatory cells and the thick pus teeming with acid fast bacilli. Most of the cases reported could not document any bacteriological evidence of tuberculosis and were diagnosed postoperatively.

Assessment of pituitary dysfunction in patients with sellar and/or suprasellar mass lesions and appropriate replacement for respective hormone deficiencies prior to intervention is essential. Majority of these patients have hormone deficiencies as shown in Table 1. The most frequent hormone deficiencies encountered in these patients are adrenocorticotropic hormone (ACTH), thyroid stimulating hormone (TSH) and hyperprolactinemia [5–7]. However, growth hormone (GH) reserve was not assessed in most of these patients. Our patient had panhypopituitarism with GH, ACTH, TSH, LH, FSH and ADH deficiency. His basal 0800 hour cortisol was  $< 100$  nmol/l indicative of a poor adrenal reserve which did not require any further dynamic testing for assessment of HPA axis.

Parenchymal neuro-tuberculosis usually presents as tuberculomas and rarely as tubercular abscesses [18, 19]. Tubercular abscess is characterized by an encapsulated collection of pus containing viable tubercle bacilli and without classical tubercular granulomas and epithelioid cells [18, 19]. The pathogenesis of abscess involves a series of events including a tuberculoma undergoing caseation, liquefaction and polymorphonuclear infiltration possibly by the hydrolytic enzymes present in brain [20].

Due to limited experience, the type of antitubercular drug regimens and duration of treatment is not defined. However antitubercular therapy combined with surgery yields better outcome than surgery alone [21–23]. Some patients may have a paradoxical increase in size of abscess despite being on antitubercular therapy [21–24]. Our patient had a remarkable improvement after stereotactic aspiration, antitubercular therapy and steroids.

Table 1.

Study	Age/Sex	Presentation	Tuberculosis elsewhere	Sellar involvement	Supra-sellar involvement	Stalk	Endocrine status before treatment	Endocrine status after treatment
Coleman et al. [5]	57 F	Headache, visual symptoms	No	+	-	-	-	-
Brooks et al. [6]	59 F	Headache, amenorrhea	Lungs	+	+	-	Hypopit	Improved
Esposito et al. [7]	54 F	Headache	Lungs	+	-	-	N	N
Eckland et al. [8]	37 F	Headache, visual symptoms, cranial nerve palsies	Lymph node	+	+	-	Hypopit	Improved
Delisdine et al. [9]	45 F	Headache, amenorrhea, deafness	Sinusitis, otitis	+	0	-	↑ PRL	↑ PRL
Taparia et al. [10]	40 M	Headache visual symptoms	No	+	+	-	N	Normal
Ghosh et al. [11]	35 F	Headache, amenorrhea, visual symptoms	No	+	+	-	Hypopit	Normal
Ranjan et al. 1992	32 F 40 M	Headache, nausea Headache, lethargy	Not known Not known	+	+	-	↑ PRL 4 hypopit	Worse (Abnormal)
Pereira et al. [14]	18 F	Headache, vomiting	Not known	+	+	-		
Ashkan et al. [16]	27 M	Headache, lethargy	Not known	+	+	-		
Ashkan et al. [16]	35 F	Headache visual symptoms, galactorrhoea amenorrhea	Not known	+	+	-	Hypopit	Normal
Pereira et al. [14]	55 F	Headache, visual symptoms	No	+	+	-	Panhypopit	Not mentioned
Ashkan et al. [16]	33 F	Headache, amenorrhea	Lymph node, Eyes	+	+	+	Panhypopit	Not mentioned
Ashkan et al. [16]	31 F	Headache, amenorrhea, galactorrhoea	Lung	+	+	+	Panhypopit	Partial recovery
Manghani et al. [17]	24 M	Headache, decreased libido	Not mentioned	+	+	+	0	0
Jain et al, 2001	5 M	Irritability central diabetes insipidus	No	+	+	+	Hypopit	Normal
Altunbasak et al. [15]		-	No	0	+	+	Hypopit	Improved
Gucuyener et al. [13]			No	0	+	+	0	0
Poon et al. [12]			-	0	+	+	0	0
Bhansali et al. 2004	13 M	Headache, visual symptoms, diabetes insipidus	No	0	+	+	Pan- hypopit	DI improved

+ : positive; - : not done/not mentioned; 0 : Absent

In conclusion, tuberculosis is an important differential diagnosis of suprasellar mass lesions in adolescents especially in developing countries. Early recognition and multimodality treatment with antitubercular therapy and surgery is rewarding.

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