

# Tuberculoma Of The Cavernous Sinus

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## Citation

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## Abstract

**Background:** Although intracranial tuberculomas are relatively common lesions, involvement of the cavernous sinus is extremely rare, and only 6 cases have been reported in the literature, till now. In this paper, a new case of cavernous sinus tuberculoma is presented, along with the review of the previously published cases.

**Case:** A 67-year-old woman was presented with the complaints of headache, diplopia, and ptosis. Radiological examination revealed a left cavernous sinus lesion. She had no sign of any kind of systemic disease, including tuberculosis. The patient was operated, and the histopathological examination revealed the diagnosis of tuberculoma.

**Conclusion:** Intracranial tuberculomas can be situated in every location and can mimic any lesion. Pulmonary involvement is not always present and radiological studies are not conclusive. Biopsy is diagnostic and treatment is medical. Especially in the presence of risk factors, a high index of suspicion should be maintained.

## INTRODUCTION

Intracranial tuberculomas are rather common lesions, accounting for 10-30% of all intracranial masses in developing countries.[1] They are commonly located in cerebral hemispheres and basal ganglia in adults, and in cerebellar hemispheres in children.[2] Rare locations, such as brainstem, cerebellopontine angle, and pituitary gland have been reported.[3] Involvement of the cavernous sinus is extremely rare, and only 6 cases have been reported in the literature, till now.[4,5,6,7,8,9] In this paper, we report a new case of cavernous sinus tuberculoma, along with the review of the previously reported cases.

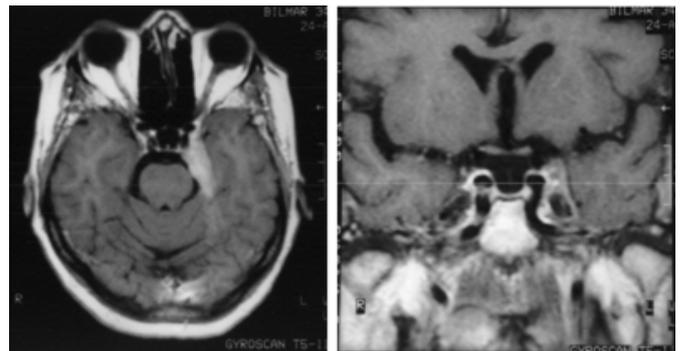
## CASE REPORT

A 67-year-old woman was presented with the complaints of headache, diplopia, and ptosis. Her physical examination was normal and she had no significant previous medical history. Neurological examination revealed involvement of 3<sup>rd</sup> and 4<sup>th</sup> cranial nerves on the left. Her blood chemistry was within normal ranges and the chest radiogram was normal. Computed tomography (CT) scans revealed a hyperdense lesion, involving the left cavernous sinus. Magnetic resonance imaging (MRI) demonstrated a globoid lesion, which was hypointense on T1 weighted images, enhancing homogenously following contrast administration, and

extending from the superior orbital fissure to the tentorium (Fig 1). Cerebral angiography did not revealed any pathological signs.

## Figure 1

Figure 1: Axial (A) and coronal (B) MRI scans of the patient following contrast administration.



The patient was operated with the pre-operative diagnosis of cavernous sinus meningioma. The lesion was approached via a left frontotemporal craniotomy coupled with an orbitozygomatic osteotomy, as described by Sekhar et al.[10] The sphenoid ridge was removed and the anterior clinoid process was drilled. The lesion was poorly vascular and loosely adherent to the lateral wall of the cavernous sinus. It was totally resected. Histopathological examination revealed

a necrotic caseous center surrounded by epitheloid cells, Langhans giant cells and lymphocytes. The diagnosis was tuberculoma.

The patient was transferred to intensive care unit (ICU) post-operatively. Her Glasgow Coma Scale (GCS) score was 13. First post-operative day was eventless, and oral feeding was initiated. On the 2<sup>nd</sup> post-operative day, she had aspirated and developed aspiration pneumonia. Clinical picture was rapidly deteriorating. She was intubated and connected to ventilator. Despite all the measures, she died on the 4<sup>th</sup> post-operative day.

**DISCUSSION**

Tuberculosis is still a serious health problem in developing countries. There is also resurgence in developed countries due to human immunodeficiency virus (HIV), immigration and development of multi-drug resistant strains.[1] Central nervous system involvement of tuberculosis is 10%, and it may appear as tuberculous meningitis, tuberculoma, abscess or Pott's disease.[11] Tuberculomas account for 10-30% of all intracranial masses in developing countries, and 0.5-2% in developed countries.[2] They are commonly located in cerebral hemispheres and basal ganglia in adults, and in cerebellar hemispheres in children, due to the large blood supply to these areas.[4] Rare locations, such as brainstem, cerebellopontine angle, and pituitary gland have also been reported.[3] Involvement of the cavernous sinus is extremely rare, and only 6 cases have been reported (Table 1). Present case is the 7<sup>th</sup> case in the literature.

**Figure 2**

Table 1: Summary of the 7 patients with tuberculoma of the cavernous sinus.

CASE NO	1 [7]	2 [8]	3 [5]	4 [6]	5 [4]	6 [9]	7*
AGE	42	33	65	48	44	44	67
SEX	Female	Male	Female	Male	Male	Female	Female
CRANIAL NERVE INVOLVEMENT	5 <sup>th</sup> , 6 <sup>th</sup>	3 <sup>rd</sup> , 4 <sup>th</sup> , 6 <sup>th</sup>	3 <sup>rd</sup> , 4 <sup>th</sup> , 6 <sup>th</sup>	3 <sup>rd</sup> , 5 <sup>th</sup>	3 <sup>rd</sup> , 4 <sup>th</sup> , 6 <sup>th</sup>	3 <sup>rd</sup> , 4 <sup>th</sup>	3 <sup>rd</sup> , 4 <sup>th</sup>
PULMONARY TUBERCULOSIS	(-)	(-)	(-)**	(+)	(+)	(-)	(-)
SURGERY	(+)	(+)	(-)	(+)	(-)	(+)	(+)
MEDICATION	IRP	IRPE+St	IRPE	IRE	IRPS+St	IRP	None
RESOLUTION OF DEFICITS	Complete	Complete	Partial	Complete	Complete	Complete	Died

\* Present case  
 \*\* Cervical lymph node biopsy confirmative of tuberculosis  
 \*\*\* I = Isoniazid, R = Rifampin, P = Pyrazinamide, E = Ethambutol, S = Streptomycin, St = Steroids

Patients generally present with the complaints of ptosis, headache, and diplopia. Neurological examination reveals involvement of the cranial nerves contained within the cavernous sinus. Pulmonary tuberculosis was present in only two of the cases [4, 6], and in one of the cases [5] there was cervical lymph node involvement.

CT scans of a tuberculoma reveal an iso – to – hyperdense

lesion with varying contrast enhancement pattern.[12] T1-weighted MRI demonstrates an iso – to – hypointense lesion. On T2-weighted images, it can appear as a hyperintense lesion or a hyperintense center surrounded by a hypointense rim.[13] Therefore there are no pathognomonic radiological findings for a tuberculoma. There is also a recent paper regarding diffusion-weighted MRI and MRI spectroscopy in the diagnosis of tuberculoma, but it is concluded that these techniques are also unable to provide a specific characterization.[14]

Surgery was performed in 5 of the 7 cases, in order to establish a diagnosis or with a pre-operative diagnosis of meningioma, such as in our case. In one of the cases, the patient had pulmonary tuberculosis, so empiric therapy was initiated.[4] In another case, cervical lymph node biopsy was positive for tuberculosis.[5] In the remaining five cases; the lesion was partially or completely resected.

Histopathological examination of a tuberculoma reveals a necrotic caseous center surrounded by a capsule composed of fibroblasts, epitheloid cells, Langhans giant cells and lymphocytes.[1] Biopsy of the lesion is essential for establishing a diagnosis. Recent papers also suggest stereotactic biopsy as an alternative to craniotomy, and diagnostic yields up to 85% have been reported.[15]

Mainstay of treatment in intracranial tuberculomas is medical. Surgery is reserved for large, solitary lesions with significant mass effect and unresponsive to medical treatment.[2] Medical treatment consists of isoniazid, rifampin, and pyrazinamide for the initial 2 months, followed by only isoniazid and rifampin for the remaining time.[11] Although the recommended duration of treatment is 12 months, shorter and longer courses are proposed.[4]

Addition of steroids to the regimen is advised, in order to prevent paradoxical expansion of the lesion during medical treatment.[16] Overall mortality is 10%. [13]

**CONCLUSION**

In conclusion, intracranial tuberculomas can be situated in every location and can mimic any lesion. Pulmonary involvement is not always present and radiological studies are not conclusive. Biopsy is diagnostic and treatment is medical. Especially in the presence of risk factors, a high index of suspicion should be maintained.

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