Case Report

An Unusual Case of Primary Intracranial Germinoma with Diffuse Subarachnoid Spread Masquerading as Tuberculous Meningitis

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Abstract

Central nervous system (CNS) germinomas often extend or disseminate into the ventricular and subarachnoid space. We present a case of primary CNS germinoma consisting mainly of meningeal dissemination, which is extremely unusual and must be kept in the differential diagnosis.

Keywords: *Germinoma, subarachnoid dissemination, tubercular meningitis*

Introduction

The primary intracranial germ cell tumor (GCT) is rare constituting only a small percentage of all intracranial tumors. The most common GCT is germinoma, with the suprasellar region being the most favored site.[1] The most common mode of presentation is compression over the adjacent structures with raised intracranial pressure, visual defects, and neuroendocrine symptoms. Cerebrospinal fluid (CSF) spread has been known, but subependymal spread with CSF dissemination along the basal cistern as primary presentation is extremely rare. The aim of reporting this case is to illustrate the unusual presentation clinically and radiologically mimicking tubercular meningitis/periventricular lymphoma, causing the wrong primary diagnosis, and only histopathological examination could make the diagnosis of true neoplastic nature of the lesion.

Case Report

A 20-year-old male referred to our neurosurgical clinic as a case of multiple periventricular mass, suspected tuberculomas, with obstructive hydrocephalus on anti-tubercular therapy for 2 months. The available previous records of the patients showed a history of difficulty in walking (generalized weakness) for 2 months and altered sensorium for 5 days; there was no other significant history. Magnetic resonance imaging (MRI) brain showed prominent nodular hyperintensities around the left occipital horn, bilateral frontal horns, right thalamic region, and altered signal intensities in the corpus callosum [Figure 1]. The patient was managed conservatively and was discharged (no details were available). The patient again presented, 3 months later, with complaints of altered sensorium and no motor deficit. Routine blood and CSF investigations were within normal limits. The available images showed progression of the lesion with diffuse involvement of the left occipital horn, third ventricle, and bilateral frontal horn with the appearance of new solid-cystic lesions around the frontal horn and pineal region. Magnetic resonance spectroscopy showed lipid peak [Figure 2]. The patient was started on anti-tubercular therapy with steroids on a suspicion of multiple tuberculomas as a differential diagnosis. The patient improved clinically and was discharged. Now, the patient again presented to the neurosurgery emergency of the same hospital with complaints of multiple episodes of vomiting and generalized weakness. Noncontrast computed tomography (NCCT) scan of the brain showed significant diffuse nodular densities around the lateral and third ventricle with an irregular ventricular enlargement [Figure 3]. At the current presentation, the patient was in altered sensorium for 5 days and on examination, he was drowsy and spontaneously moving all the four limbs equally with Glasgow

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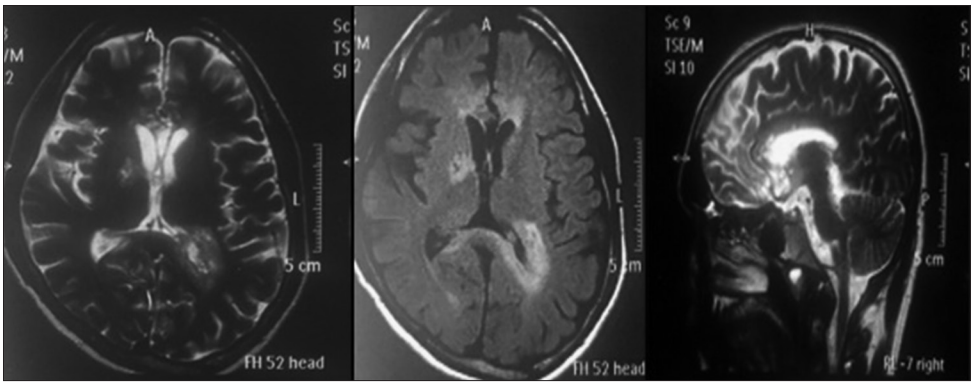

Figure 1: Magnetic resonance imaging brain showing prominent nodular hyperintensities around the left occipital horn, bilateral frontal horns, right thalamic region, and altered signal intensities in the corpus callosum

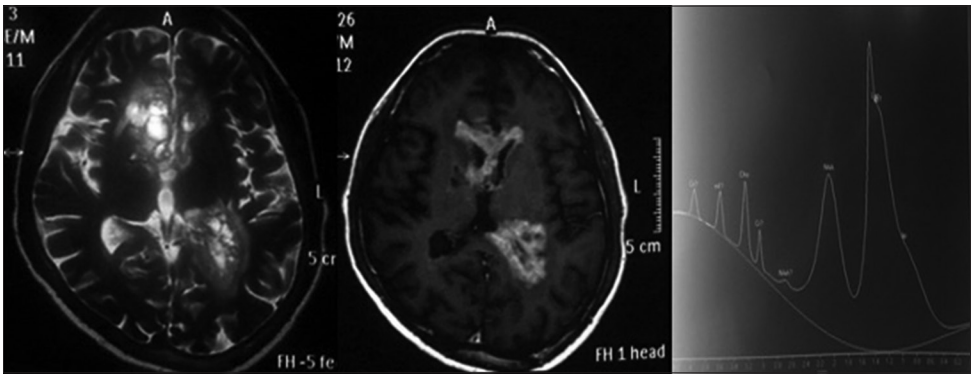

Figure 2: Progression of lesion with diffuse involvement of the left occipital horn, third ventricle, and bilateral frontal horn with appearance of new solid-cystic lesions around the frontal horn and pineal region. Magnetic resonance spectroscopy showing lipid peak

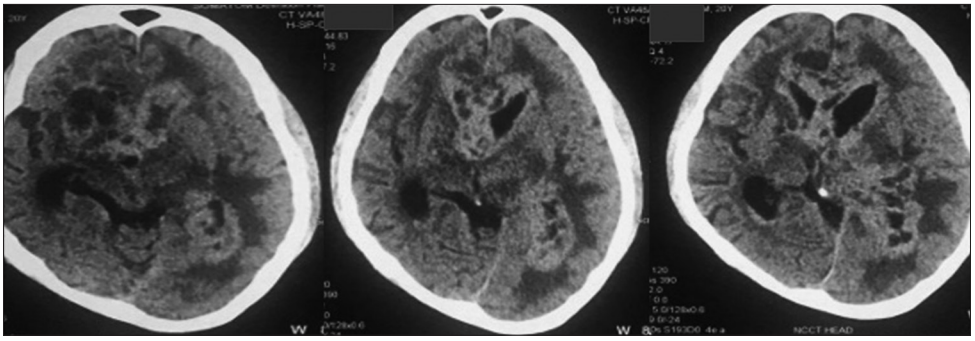

Figure 3: Noncontrast computed tomography scan of brain showing significant diffuse nodular densities around the lateral and third ventricle with irregular ventricular enlargement

Coma Scale E4V2M5; his bilateral pupils were reacting to light and fundus examination showed bilateral papilledema. A NCCT brain showed obstructive hydrocephalus along with previous lesions [Figure 4]. The patient was planned for urgent craniotomy and decompression. Right pterional craniotomy and tumor decompression was done. The lesion was heterogeneous in the consistency, mildly vascular, suckable, infiltrating into the 3rd ventricle and frontal horn, encasing the anterior cerebral artery without any plane of cleavage. The histopathological examination was suggestive of morphological features of Germinoma with immunohistochemistry features were also characteristic of Germinoma with oct3 and SALL4 positivity [Figure 5].

Discussion

Germinomas are the most common intracranial GCTs. The most common presentation of these tumors is due to infiltration and mass effect over the surrounding structures such as aqueduct causing obstructive hydrocephalus, chiasma causing visual deterioration, hypothalamic–hypophyseal dysfunction, or tectal infiltration causing features of Parinaud's syndrome, but in our patient, the presentation was atypical. The radiological features were also unusual, not favoring any particular lesion such as neoplastic, inflammatory, and infectious etiologies. In this case, considering the patient's age and clinicoradiological

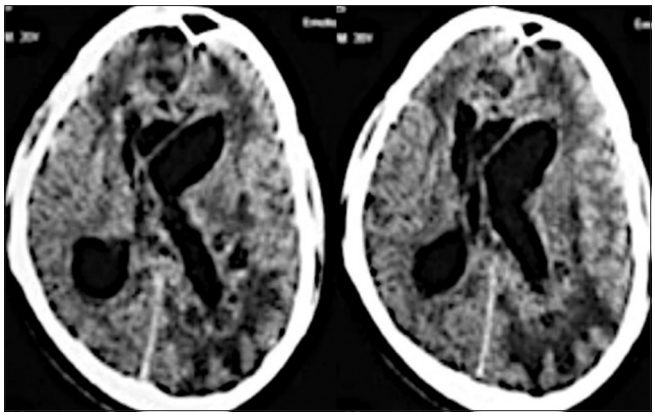

Figure 4: Noncontrast computed tomography brain showing obstructive hydrocephalus along with previous lesions

features, meningitis of tubercular etiology must have been kept as a primary diagnosis with lymphoma as a second possibility. The characteristic neuroimaging features of tubercular meningitis include leptomeningeal and basal cisternal enhancement with thick basilar exudates, especially in the interpeduncular fossa, prepontine cistern, ambient cistern, suprasellar cistern, and Sylvian fissures, presenting as confluent enhancing lesions. On MRI, ependymitis presents with a thickened and enhanced ependymal lining, dilated ventricles, and presence of debris with irregular margins in the dependent portions of the ventricles. Periventricular infarcts are also frequently seen. Lymphoma is generally a homogeneous lesion, whereas germinoma is more often heterogeneous with microcystic areas and the surrounding edema is generally less marked in lymphoma than other intracranial tumors with low or no mass effect. Although ependymal and sub-arachnoidal extension/dissemination are frequent in central nervous system lymphomas, they can be seen in other tumors such as germinoma, high-grade astrocytoma, pineoblastoma, and metastasis. In this case, the Germinoma was not considered as a differential diagnosis due to atypical radiological features, non-availability of tumor markers, and very few reports in the literature of Germinoma with diffuse subependymal dissemination. The significant progressive degree of ependymitis and subarachnoid spread could have been responsible for the mistaken diagnosis of tubercular meningitis clinicoradiologically. The leptomeningeal dissemination can be diagnosed by a single CSF study, but unfortunately, it was not available. In the available literature, very few cases have been reported either as a case of periventricular germinoma mostly involving ventricles only, or a midline lesion with the involvement of lateral ventricle, or a midline lesion with the involvement of one or more ventricle.[4,7,8] In Indian literature, only one reported case may be found, of an intracranial germinoma with subarachnoid spread.[9]

Conclusion

This case represents an unusual rare presentation of primary intracranial germinoma, which must be kept in

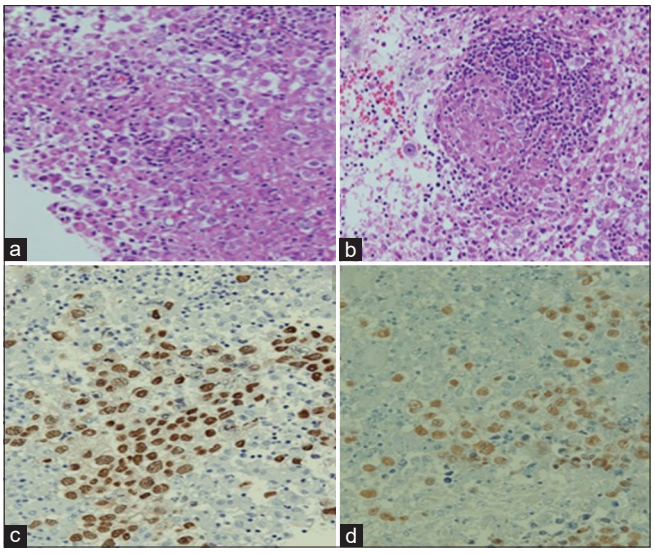

Figure 5: (a) H and E, ×20, showing tumor cells having large vesicular nuclei and prominent eosinophilic nuclei, admixed are numerous mature lymphocytes. (b) H and E, ×10, granuloma with cuff of lymphocytes at one end. (c) Immunohistochemistry for oct3 showing strong nuclear positivity, characteristic of germinoma. (d) Immunohistochemistry for SALL4 showing strong nuclear positivity, characteristic of germinoma

diagnosis with diffuse subependymal spread, and CSF analysis must be done for the diagnosis of subarachnoid dissemination, as positive CSF cytology may be considered sufficient for initiating radiation therapy for such curable radiosensitive tumor even without the invasive tissue diagnosis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the legal guardian has given his consent for images and other clinical information to be reported in the journal. The guardian understands that names and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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