Case Report

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Primary Diffuse Leptomeningeal Gliomatosis Primararily Involving the Spinal Cord Simulating Tuberculous Meningitis

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Abstract

Primary leptomeningeal gliomatosis is a rare, neoplastic syndrome which is highly fatal. Here is a 15 year female presenting with weakness of both lower limbs for 3 months of duration. Started on ATT presuming as tuberculous meningitis. MRI studies showed subacute infarcts in the medulla, B/l cerebellar hemisphere and superior vermis, abnormal basal enhancement, and meningeal enhancement in prepontine and premedullary region, edematous cord with T2, STIR hyperintensities from D3 to D10 and with D6 to D12 diffuse nodular intramedullary and dural enhancement. CSF analysis showed increase in protein ,with low glucose with no malignant cells. Weakness progressed rapidly for last 10 days and the patient succumbed to death after receiving 2 cycles of radiotherapy. Histopathology showed leptomeningeal gliomatosis (IHC: GFAP- strongly positive in tumour cells, with Ki-67-20%) in the spinal subdural lesion. Suspected morphology should be differentiated with conditions like cord astrocytoma, lymphoma, sarcoid, tuberculosis and leptomeningeal gliomatosis should be ruled out in case of rapidly progressing disease course.

Keywords: Leptomenginges; Fibrillary Variant; Diffuse Enhancement; Nervous System; Weakness of Limbs.

Introduction

Primary diffuse leptomeningeal gliomatosis (PDLG) is a rare fatal neoplastic syndrome characterized by widespread infiltration of the meninges by tumor apparently arising from heterotopic glial nests. These heterotopias in the leptomeninges are the cell rests found in 1% of normal autopsies and in 25% of autopsies on patients with congenital neurological abnormalities. The most common heterotopias in the leptomeninges consists of a glial fibrillary matrix with astrocytes. Other cells identified being- oligodendrocytes, ependymal cells, neurons, choroid plexus etc. These rests are found most commonly around the medulla, lumbosacral spinal cord and cervical spinal cord. Heterotopic cell nests in the leptomeninges can cause a clinical picture similar to chronic infectious meningitis. Headache, papilledema, neck stiffness, back pain, paresthesia, lower extremity paresis and incontinence are common symptoms.

On imaging, diffuse, or less commonly, nodular meningeal enhancement involving brain, spinal cord . Differential diagnosis of this condition include arachnoiditis, infection (TB, CMV, HIV, Brucellosis, and Rocky Mountain spotted fever), lymphoma, sarcoid and Dejerine-Sottas disease. Leptomeningeal gliomatosis may also simulate occlusive vasculopathy such as multifocal infarcts and cerebral vasculitis.

Case Report

This 15 year old female presented with heaviness and paraesthesias of right lower limb for 3 months, weakness of both lower limbs for 3 months of duration. There was no history of fever, or trauma. There was no bowel and bladder disturbances. On examination patient was conscious, afebrile, with normal higher mental functions. Cranial nerve

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examination was normal. At the time of presentation there was right spastic gait with stepping. Tone in the lower limbs was more when compared to upper limb. Power in the upper limb was normal. In the lower limbs there was weakness in the hip flexion and adduction , knee flexion, ankle dorsiflexion bilaterally. DTR were exaggerated in the knee and ankle joints bilaterally.,with bilateral plantars upgoing. There was decreased pain, touch, vibration sensations below D10 dermatome. There was no cerebellar or meningeal signs.

CSF analysis was suggestive of increased protein (2.8 g/dl), with low glucose(40/121), with no malignant cells. Cells were RBC-80,WBC- 5(4 lymphocytes, 1 neutrophil).

ESR,USG abdomen- were normal. ADA levels were high. VEP was normal. CMV antibodies-negative.

MRI studies showed subacute infarcts in the medulla, bilateral cerebellar hemisphere and superior vermis, abnormal basal enhancement, and meningeal enhancement in prepontine and premedullary region (Figure 1).

Figures 2, 3 and 4 shows edematous cord with T2, STIR hyperintensities from D3 to D10 and with D6 to D12 diffuse nodular intramedullary and dural enhancement.

The patient was initially admitted in the neurology department of our hospital with intial diagnosis of transverse myelitis. In view of raised ADA levels and imageology, the patient was started on ATT in addition to steroid. As there was no improvement in the power of the lower limbs, in fact due to progression of the disease condition, surgery was planned. D12 and L1 laminectomy was performed.

Intraoperatively, after opening dura, there was brownish grey, highly vascular, soft tissue found over the cord which was adherent to the cord without a clear plane.

The Histopathologic sections showed an astrocytic tumor with hypercellularity, frequent mitosis and focal necrosis (Figure 5 and 6). Immuno-histochemistry with GFAP showed strong staining in the tumor cells and Ki 67 index was 30%. The morphology was consistent with glioblastoma (WHO grade IV). In view of predominant leptomeningeal involvement without a mass lesion, diagnosis of primary leptomeningeal gliomatosis was favored.

The patient was started on radiotherapy. There was rapid progression of the weakness of lower limbs with bladder symptoms. Had weakness of upper limb during the hospital course and had respiratory embrassment and cardio respiratory arrest and succumbed to death after 3 days of starting radiotherapy.

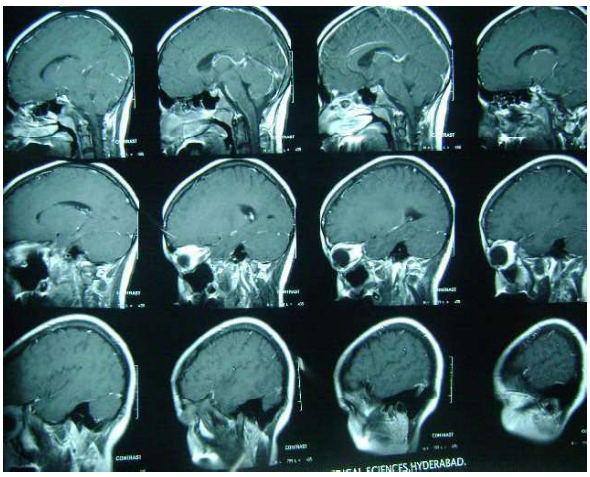

Fig. 1:

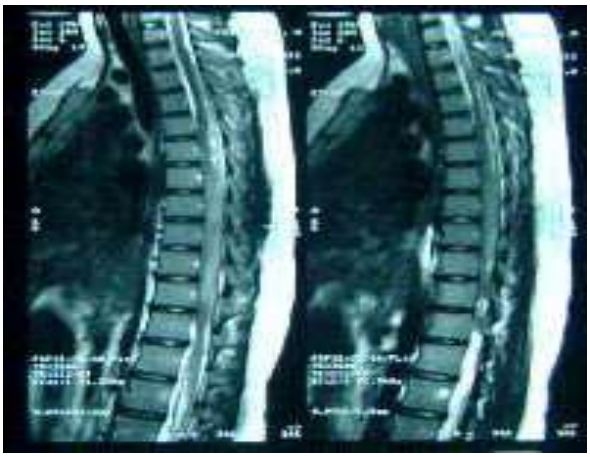

Fig. 2:

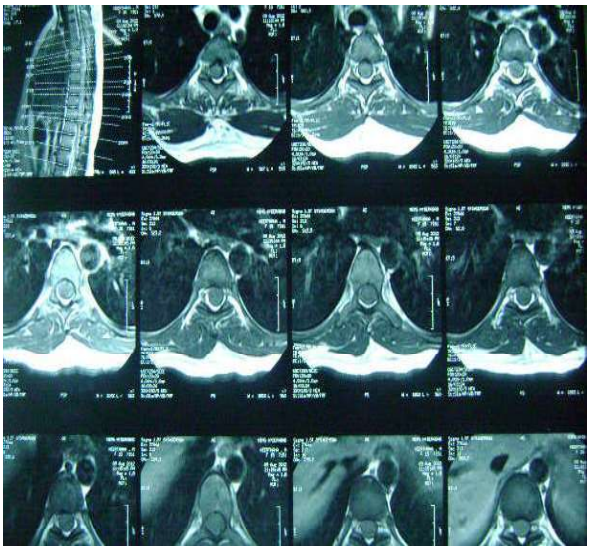

Fig. 3:

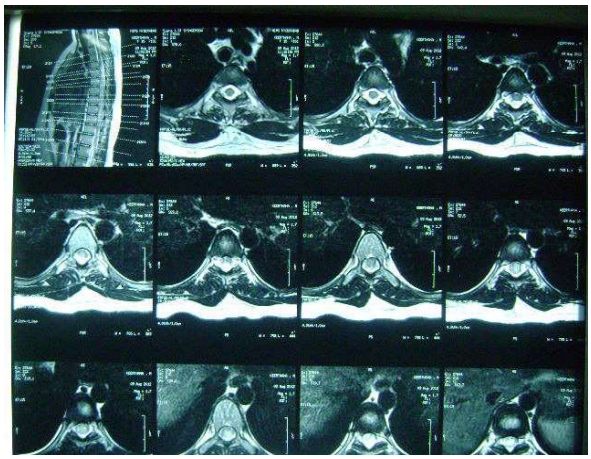

Fig. 4:

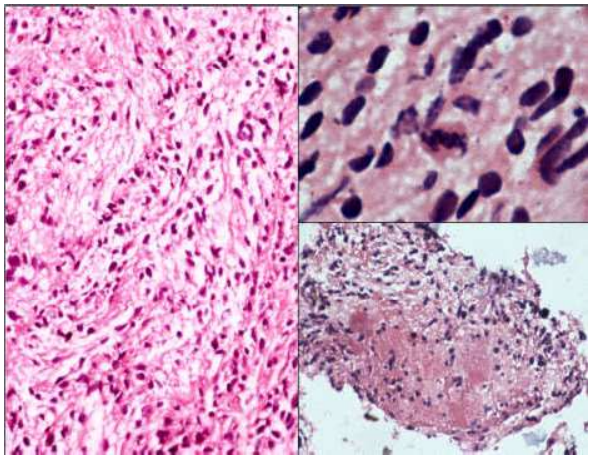

Fig. 5:

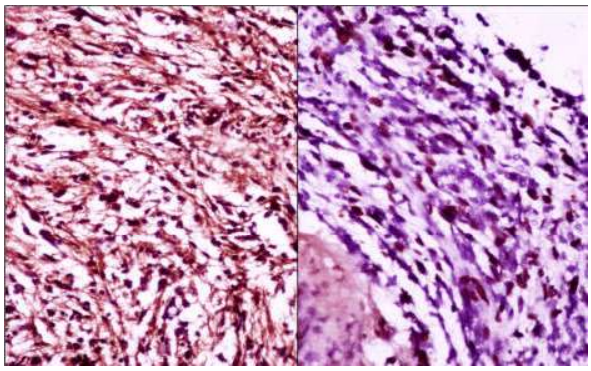

Fig. 6:

Discussion

Primary diffuse leptomeningeal gliomatosis (PDLG) is a rare neoplastic disorder of the meninges, in the absence of primary tumor within the brain or spinal cord. The disease lacks specific clinical, radiological and laboratory diagnostic criteria and the disease progresses very rapidly, hence the disease is often made very late, generally during autopsy. Hence the appropriate management of the affected patients is often delayed. The disease is often fatal in many of the cases despite some reports showed some improvement with intensive chemotherapy and radiotherapy.

In reported cases of PDLG without a clear premortem diagnosis (as in our patient) antituberculous treatment is almost always tried. Patients treated additionally with radiation or chemotherapy survive slightly longer than with drug treatment alone.Survival is also associated with different factors such as the World Health Organisation (WHO) grade of the tumour, complicating lesions such as infarcts (due to vascular compression by adventitial tumour mass) and the site of the lesion—for example, involvement of vital centers. The overall poor prognosis (comparable with gliomatosis cerebri) suggests a worse biological behavior than predicted by WHO grade of the biopsy in many cases.

Conclusion

Despite the misleading clinical presentation, with probability of tuberculous meningitis (due to high incidence) and the absence of a parenchymal lesion, the diagnosis of PLDG must be considered in cases which are a little unusual in presentation. More challenging are the cases with primary spinal cord involvement or cases without any contrast-enhancing lesions. However, the prognosis of PDLG is very poor (like our case). The case presented here indicates that PDLG may exist with clinical symptoms mimicking those of tuberculous meningitis, and the accurate diagnosis is is made only by histopathology.

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