ALL relapse with multiple cranial nerve palsies and toxic leukoencephalopathy: treatment failure with treatment toxicity

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DESCRIPTION

Acute lymphoblastic leukaemia (ALL) is one of the most common malignancies of childhood. ALL is treated with high doses of methotrexate (MTX) to prevent central nervous system (CNS) and haematological relapses. MTX is administered intravenously and via intrathecal route.[1] MTX can cause neurotoxicity by disrupting CNS folate homeostasis or by direct neuronal damage. MTX-induced acute toxic leukoencephalopathy can result in acute neurological deficit, seizures or encephalopathy.[2] We report a 27-year-old diagnosed case of ALL who presented with neurological symptoms 2 years after she was started with intensive and maintenance phase of chemotherapy. She took multiple cycles (24) of intrathecal MTX in her intensive phase and was subsequently followed up regularly after her maintenance phase for bone marrow aspiration, which showed reduced blast cells compared with the earlier report. Few weeks after completing her chemotherapy, she complained of visual blurring in the right eye followed by the left eye. It was gradually progressive painless vision loss in both the eyes associated with proptosis. Further, she noted of left-sided facial numbness and facial deviation with drooling of saliva from the angle of the mouth. Examination suggested multiple cranial nerve palsies including bilateral optic nerve with papilledema, left trigeminal nerve palsy, left facial nerve–lower motor neuron-type palsy with the left sensorineural hearing loss. Visual acuity was absent projection of light in both the eyes. Cerebrospinal fluid examination suggested malignant cytology. MRI brain showed bilateral

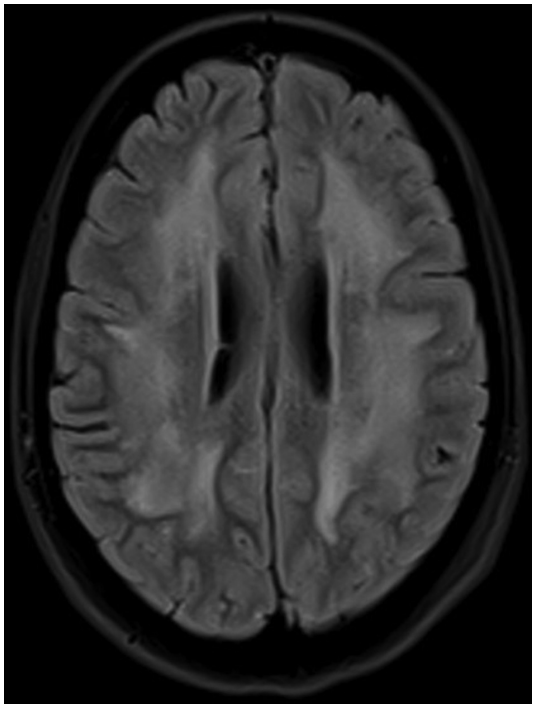

Figure 2 MRI image. T2 fluid-attenuated inversion recovery (FLAIR) sequence showing bilateral symmetrical and confluent white matter lesions.

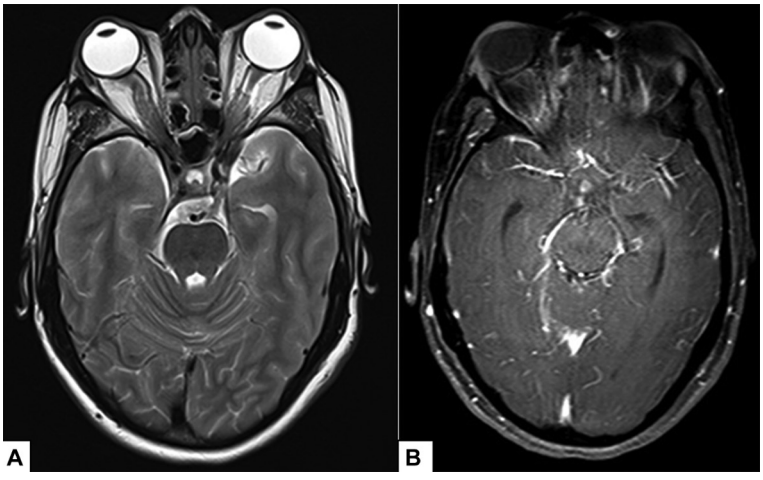

Figure 1 (A) MRI image. T2 sequence showing thickened cranial nerves—bilateral optic nerve, left trigeminal nerve in Meckel's cave. (B) Postgadolinium-enhanced axial images of MRI brain showing leptomeningeal enhancement.

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Patient's perspective

I strongly feel that such cases like mine should be reported for future references in order to make an early and definitive diagnosis. This will help in initiating correct mode of treatment for other patients.

Learning points

- Acute lymphoblastic leukaemia, being one of the most common malignancies of childhood, is often treated with high doses of methotrexate (MTX).
- High doses of MTX prevent central nervous system (CNS) recurrence as well as haematological relapses.
- However, we should keep in mind that CNS relapses and MTX-induced encephalopathy can coexist and present in various clinical manifestations including meningeal infiltration as in our case.

thickened optic nerve sheaths with postgadolinium enhancement and thickening of multiple cranial nerves suggestive of leptomeningeal enhancement (figure 1A,B). Also, symmetrical T2-weighted/fluid-attenuated inversion recovery hyperintensities noted in bilateral periventricular white matter suggestive of chemotherapy-induced leukoencephalopathy (figure 2). Although the patient had no signs pertaining to leukoencephalopathy, her symptoms were largely due to leukaemic meningeal infiltration. However, MRI brain was diagnostic for both the findings of ALL, relapse in the form of meningeal infiltration affecting multiple cranial nerves and chemotherapy-MTX-induced leukoencephalopathy. The patient was treated with cranial irradiation therapy and followed up in our neuro-oncology unit.

Contributors BSP: acquisition of data. JK: interpreted the data, conception, design, and structured the report. GuS: conducted radiological diagnosis. GaS: technical guidance.

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