CASE REPORT

Intravascular large B-cell lymphoma confirmed by brain biopsy: a case report

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SUMMARY

Intravascular lymphoma (IVL) is a rare variant of non-Hodgkin's lymphoma characterised by neoplastic lymphoid cells growing inside the lumina of medium and small vessels. The diversity of clinical presentation owing to the possibility of its occurrence in any organ often makes it a challenging diagnosis. We present an intriguing case of intravascular large B-cell central nervous system (CNS) lymphoma in which the patient presented with a non-specific neurological symptom and had no systemic symptoms or dermatological manifestations. The patient deteriorated rapidly after presentation and succumbed to multi-organ failure within 2 weeks of admission.

BACKGROUND

We present a rare case of Intravascular CNS lymphoma, in which the patient presented with non-specific neurological symptom of a short duration and no cutaneous manifestation. The clinical course of the disease was fulminant and the patient expired within 2 weeks of presenting to the outpatients department in our hospital.

CASE PRESENTATION

A 61-year-old normotensive, euglycemic gentleman presented with a history of spillage of food from the angle of mouth bilaterally 4 days prior to presentation while having dinner. He gave no history of any motor weakness, sensory phenomenon, facial deviation, dysphagia, dysarthria or diplopia. He did not have any recent viral or bacterial infection. He had no other significant medical history except for an episode of haematuria along with epistaxis 3 months ago for which he was managed elsewhere. At that time all of his investigations, which also included blood coagulation profile and prostatic specific antigen, was normal.

Upon admission his general physical examination was normal. CNS examination revealed normal higher mental functions; bilateral 3 mm, isochoric pupils with normal reaction to light. Extraocular movements were full. Fundi were normal. No craniopathy, cerebellar signs, sensory or motor weakness was identified. Plantars were flexor bilaterally and deep tendon reflexes were brisk.

INVESTIGATIONS

Routine laboratory investigations revealed marginally reduced platelets ($91\,000/\text{mm}^3$) with a normal peripheral smear. A non-contrast CT scan of head showed right parietal isodense to hyperdense lesion with mild perifocal oedema (figure 1A). Thereafter

an MRI of the brain was performed, which was suggestive of multiple heterogeneous space occupying lesions in the supratentorial compartment with a relatively larger lesion in the right parietal lobe (figure 1B). Laboratory investigations showed progressively worsening thrombocytopenia (upto $32\,000/\text{mm}^3$) and high serum LDH levels (795 IU/l). On the basis of his history and investigations a differential diagnosis of multicentric glioma, primary CNS lymphoma, metastatic disease or infectious aetiology was considered. Subsequently, the patient underwent right parietal osteoplastic craniotomy with total excision of space occupying lesion using flameless stereotaxy. Peroperatively, the right parietal cortex lesion appeared as a greyish yellow mass 1 cm below the cortex, which was moderately vascular with heterogeneous consistency and ill-defined margins. Postoperatively the patient developed progressive respiratory insufficiency necessitating ventilation support, and in view of progressive worsening of sensorium a CSF study was performed which showed lymphocytosis with raised proteins. However, CSF samples were negative for malignant cells. A bone marrow biopsy was performed which was normal. Histopathological examination of the cerebral tissue showed oedema, blood vessels showed atypical cells in the lumen with mild variation in size. The cells had nucleus with coarse chromatin and small amount of cytoplasm. The atypical cells in the vessels showed positive staining with leucocyte common antigen and CD20 (figure 1C).

OUTCOME AND FOLLOW-UP

Over the next few days there was rapid deterioration with progressive encephalopathy and multi-organ failure. The patient eventually expired within 2 weeks of admission.

DISCUSSION

Intravascular large B-cell lymphoma which was first described in 1959 by Pfelger and Tappeiner,¹ is a very rare subtype of diffuse extranodal large B-cell lymphoma. The characteristic feature of IVL is selective growth of lymphoma cells within the lumina of medium to small-sized vessels.^{2 3} The surprising degree of sparing of surrounding tissue and absence of lymphoma cells in lymph node reticuloendothelial system is a hallmark of the disease. A timely diagnosis of intravascular large B-cell lymphoma is often difficult because of variable non-specific clinical manifestations, and often the diagnosis was made upon biopsy after the patient succumbed to the disease. However, with the advancement of diagnostic technology, a

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Figure 1 (A) CT brain plain shows hypodense lesions in the right frontoparietal and left frontal regions, predominantly involving subcortical and periventricular white matter with associated mass effect causing sulcal effacement. (B) Axial T2-weighted MRI at the level of lateral ventricles demonstrates presence of multiple ill-defined patchy areas of T2 prolongation in right anterior frontal, right frontoparietal and left frontal regions, partly extending in the region of basal ganglia. Few focal hyperintensities are present in splenium of corpus callosum also. There is associated sulcal effacement in the right frontal region. (C) Photomicrograph of pathological specimen demonstrates atypical cells in the vessels showing positive staining with leucocyte common antigen and CD20.

regular health checkup and a high clinical index of suspicion, the diagnosis of IVL nowadays is more frequently being made at an early stage.

Owing to the rarity of the disease only retrospective studies have been reported and CNS involvement at initial diagnosis has been reported to vary from 24% to 33% according to various retrospective studies.^{4–5} CNS manifestation may manifest as sensory or motor deficit, rapidly progressive dementia, seizures, hemiparesis, dysarthria, ataxia, vertigo and transient visual loss.^{5–7} According to a literature review two-thirds of the patients with IVL had one or more of four neurological presentations: progressive multifocal cerebrovascular events (76%), spinal cord and nerve root vascular syndromes (38%), subacute encephalopathy (27%) and peripheral or cranial neuropathies (21%).⁵

This patient did not have any cutaneous manifestation; however, non-specific CNS manifestation in the form of spillage of food was present. To the best of our knowledge CNS IVL with such a manifestation has not been reported till date. In view of the rapid deterioration of the patient's condition a biopsy of the CNS lesion was performed and the diagnosis of IVL was confirmed. Our patient did have a history of haematuria. However, his renal function tests performed upon admission were subsequently normal. Though rarely IVL and CNS lesions have been diagnosed at the same time, according to a case series of five patients by Imai *et al*, cerebral mass occupying lesion owing to an extravascular component is a late manifestation.⁸

IVL in most cases is disseminated at the time of the diagnosis and warrants systemic chemotherapy. An anthracycline-based chemotherapy regimen such as cyclophosphamide, doxorubicin, vincristine and prednisone (CHOP) with the addition of monoclonal antibodies rituximab (R-CHOP) are used. However, they respond poorly in patients in whom IVL can be found in CSF either on cytopathology or PCR for IgH gene rearrangement, and should be treated with a regimen similar to that followed for primary/secondary CNS lymphomas. Plasmapheresis may

lead to a transient but significant amelioration of neurological symptoms.⁹

The most remarkable feature of this patient was that he did not have any cutaneous or specific neurological features. To the best of our knowledge CNS IVL with such non-specific features has not been reported. Upon presentation to our outpatient department there was not enough clinical evidence to suspect it as a case of IVL. However, on admission non-specific CNS symptoms, thrombocytopenia, elevated LDH levels and a rapid clinical deterioration of the patient prompted us to investigate further. We confirmed the diagnosis of IVL antepartum with a biopsy on presentation. Thus, in a scenario where the patient has non-specific neurological symptoms and intracranial space occupying lesions, a neurologist should have a high index of suspicion for IVL, especially if there is a rapid deterioration in the neurological status of the patient.

Learning points

- ▶ Perhaps the only case of central nervous system intravascular lymphoma (CNS IVL) with non-specific neurological manifestation and no cutaneous manifestations.
- ▶ A scenario where the patient has non-specific neurological symptoms and intracranial space occupying lesion, one should have a high index of suspicion of IVL, especially if there is rapid deterioration in the neurological status of the patient.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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