Abstract No. ABS000032

Optic Neuritis And Ischaemic Optic Neuropathy As First Sign Of Central Nervous System Relapse in Acute Myeloid Leukemia: MRI Findings And Its Diagnostic Challenge

Michelle Cheung, Benjamin XH Fang, Raymand Lee, Wendy WM Lam, Tina PW Lam
Department of Radiology, Queen Mary Hospital, Hong Kong SAR

Objective

To illustrate a case and discuss the MRI findings of optic neuritis and ischaemic optic neuropathy as first sign of CNS relapse in a patient with background of AML in complete remission (CR).

Case illustration

22 year old patient with history of AML in CR presented with bilateral painless visual blurring. CE-MRI brain + orbits showed diffuse enhancement of right optic nerve with swelling with no other significant intracerebral abnormalities (Fig. 1). CSF cytology was negative for blast cells.

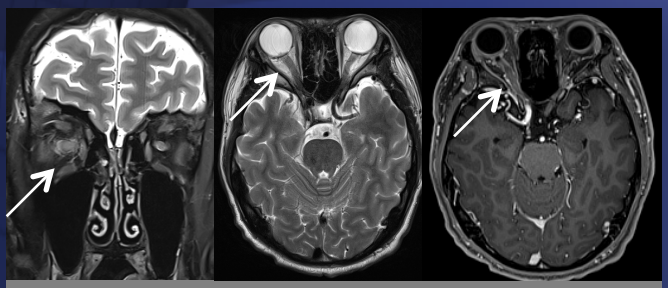

Fig. 1. (L to R): Coronal T2W, Axial T2W & T1W Post Gd

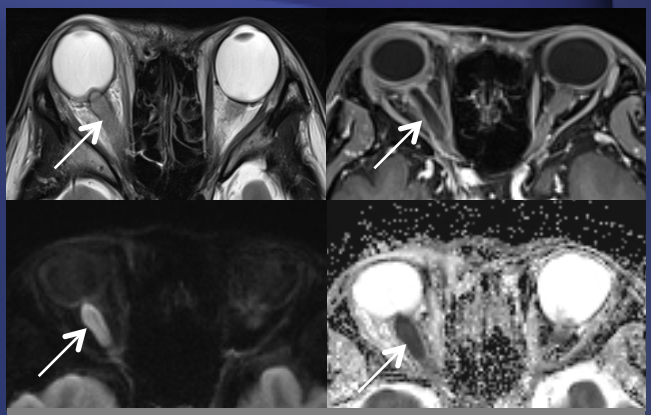

Fig.2. (top): T2W, T1W Post Gd, (bottom): DWI, ADC

Patient developed deterioration of both eyes with no light perception 2 weeks later. Second MRI performed showed non-enhancement of the swollen right optic nerve with restrictive signals on DWI, highly suggestive of acute ischaemic optic neuropathy (Fig. 2). Left optic nerve was also swollen with diffuse increased T2W signal and enhancement. There was also leptomeningeal enhancement (Fig. 3). CSF cytology found 97% blast cells. Clinical diagnosis of CNS relapse with leukaemic optic nerve infiltration was arrived at. High-dose Ara-C and high-dose methylprednisolone was started. Unfortunately, vision never returned.

Discussion

Central nervous system involvement in adult AML relapse is relatively rare with current therapies. Imaging plays an important role in the detection of CNS involvement, particularly when CSF cytology is negative. Our case illustrated how radiological findings had preceded cytological positivity. MRI is the imaging modality of choice for evaluation of the optic pathway in patients with optic neuropathy.[1] Both leukaemic infiltration and inflammation of the optic nerve have comparable signs and symptoms that are highlighted in our case (optic nerve T2W hyperintensity, thickening and enhancement Fig. 1). Presence of other associating imaging findings of CNS involvement on MRI is helpful in distinguishing between the two. These include presence of leptomeningeal and pachymeningeal enhancement (Fig. 4), or enhancement of other cranial nerves (Fig. 5).[2,3]

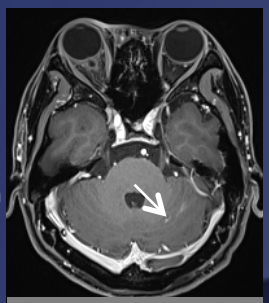

Fig. 3. T1W Post Gd

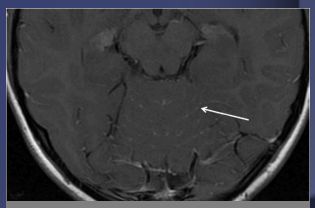

Fig. 4. T1W Post Gd [2]

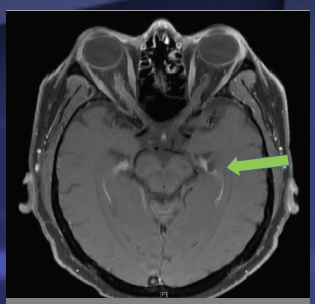

Fig. 5. T1W Post Gd, CN5 [3]

In patients with known or history of leukaemia in CR, presence of thickening and enhancement of the optic nerve, even if as sole finding, should raise concern for leukaemic infiltration and necessitates a differentiation from optic neuritis.[2] We postulate the progression into ischaemic optic neuropathy in our patient could be a result of hypercellularity (Fig. 2). Leukaemic optic nerve involvement is a neuro-oncological emergency; prompt recognition and management is crucial as it may lead to acute ischaemic optic neuropathy, and ultimately irreversible visual loss, which unfortunately was the case for our patient.

References

1. Gala, F. Magnetic resonance imaging of optic nerve. Indian J Radiol Imaging. 2015;25(4): 421-438.
2. Yo, H.R. Enhancement of Optic Nerve in Leukemic Patients: Leukemic Infiltration of Optic Nerve versus Optic Neuritis. IMRI. 2016;20(): 167-174.
3. Patel, SA. Acute Myeloid Leukemia Relapse Presenting as Complete Monocular Vision Loss due to Optic Nerve Involvement. Case Reports in Hematology. 2016;2016:1–4.