Capecitabine-Induced Leukoencephalopathy: A Case Report

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Introduction

Capecitabine is an oral prodrug of 5-fluorouracil (5-FU). Neurotoxicity is uncommon; with hardly 10% of cases with leukoencephalopathy reported in the past years.

We present a case with imaging-proven toxic leukoencephalopathy soon after starting adjuvant CAPOX, with full clinical and radiologic recovery after drug withdrawal.

CASE PRESENTATION (TIMELINE)

40-year-old male with moderately differentiated adenosquamous carcinoma of the 2nd part of the duodenum; underwent Whipple procedure in March 2024 (ypT3bN2).

Adjuvant regimen: Capecitabine 1000 mg/m² for 14 days + Oxaliplatin 130 mg/m² (CAPOX), first cycle on Apr 24, 2024.

Day 9 (May 2, 2024): Motor aphasia → slurred speech which eventually settled over the next 12 hours ; Sensory and motor examination was unremarkable along with intact cranial nerves

CT brain unremarkable. Labs incl. CBC, electrolytes, LFTs and metabolic profile were within reference ranges.

Initial impression was TIA; MRI brain was advised and neoplastic agents held until clinical recovery

Day 13: MRI brain Fig 1A was suggestive of capecitabine-induced leukoencephalopathy. No metastatic disease was seen. By this time, all of his symptoms were resolved, and he had no focal neurological deficit.

CSF was also done as per discussion with neurology ; cytology was negative along with other results.

His chemotherapy was held further as risks outweighed potential benefits and repeat MRI scan done

MRI fig 2 : (4 days after symptom onset): showed interval resolution of bilateral frontoparietal cortical and white matter signal abnormality and diffusion restriction

The patient is on surveillance since then, with no further neurological symptoms observed, and has remained disease-free for past one year.

CASE REPORT

Since all the investigations done ruled out other causes patients chemotherapy was held further as risks outweighed potential benefits and repeat MRI scan done

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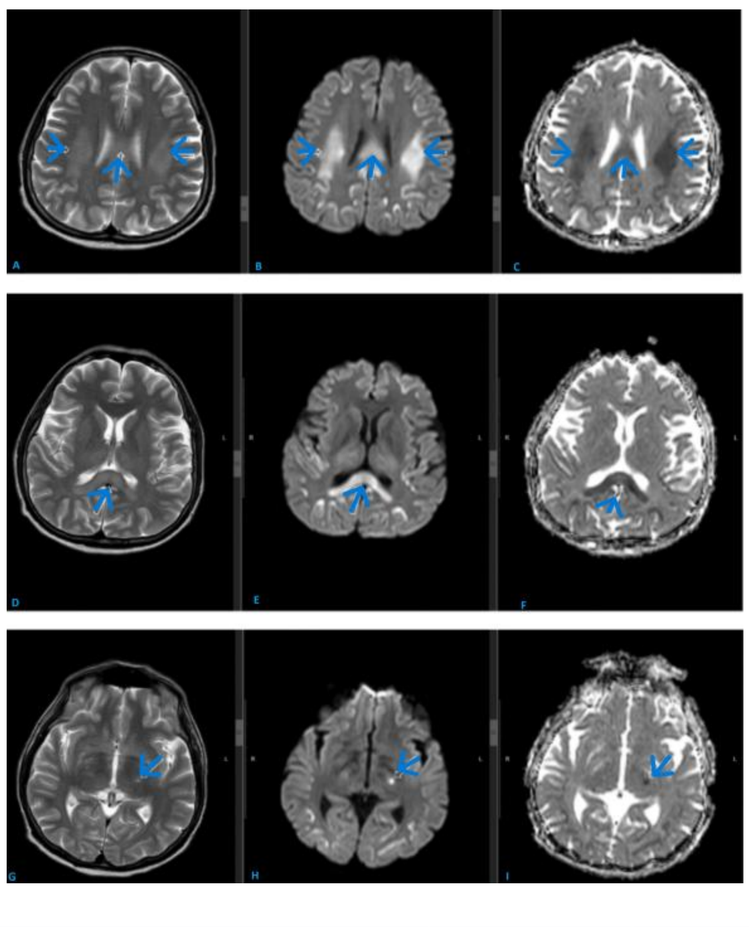
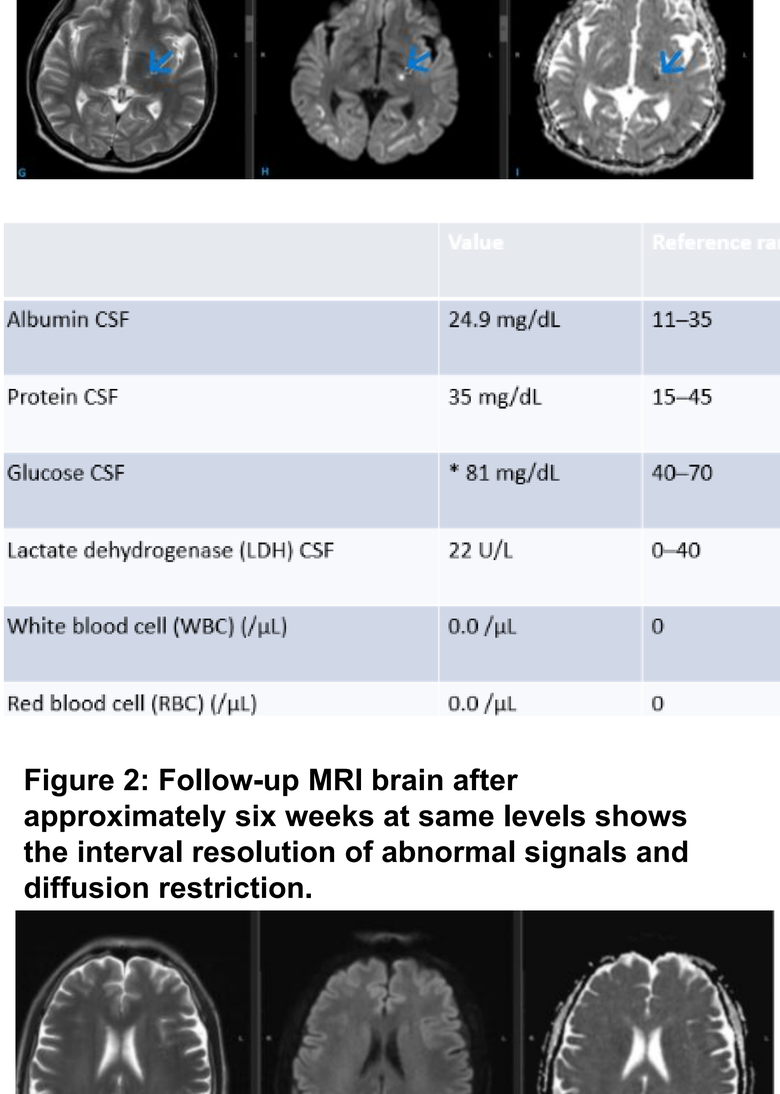
Figure 1: MR brain shows extensive abnormal T2 high signal with corresponding diffusion restriction in the bilateral frontoparietal white matter; trunk and splenium of corpus callosum and also a tiny focus in the left thalamus.



	Value	Reference range
Albumin CSF	24.9 mg/dL	11–35
Protein CSF	35 mg/dL	15–45
Glucose CSF	* 81 mg/dL	40–70
Lactate dehydrogenase (LDH) CSF	22 U/L	0–40
White blood cell (WBC) (/µL)	0.0 /µL	0
Red blood cell (RBC) (/µL)	0.0 /µL	0

Figure 2: Follow-up MRI brain after approximately six weeks at same levels shows the interval resolution of abnormal signals and diffusion restriction.



DISCUSSION

Capecitabine-induced leukoencephalopathy, first reported in 2004, occurs mainly in older adults and may be linked to its metabolite crossing the blood-brain barrier.
Risk factors include DPD deficiency, renal/hepatic impairment, prolonged treatment, and concurrent neurotoxic drugs.
Radiologic findings typically show symmetric lesions in white matter tracts, particularly the corpus callosum.
Oxaliplatin, another chemotherapeutic agent, can cause reversible posterior leukoencephalopathy with different imaging patterns and clinical presentation including acute sensory toxicity .
In this case, clinical and imaging features pointed to capecitabine-induced toxicity, confirmed by symptom resolution after stopping chemotherapy.

	Value	Reference range
White blood cell (WBC)	6.74 × 10^3/µL	4.52–10.93
Hemoglobin (HB)	* 11.6 g/dL	13.2–16.7
Platelet (PLT)	315 × 10^3/µL	150–450
Sodium	136 mmol/L	136–145
Potassium	4.07 mmol/L	3.5–5.1
Creatinine	* 0.82 mg/dL	0.90–1.30
Bicarbonate	28.8 mmol/L	22–29
Ca, corrected	9.734 mg/dL	8.5–10.5
Magnesium	1.70 mg/dL	1.6–2.6
Phosphorus	4.3 mg/dL	2.9–4.7
Blood sugar level (BSL)	135 mg/dL	70–140

CONCLUSION

Clinicians should remain vigilant for rare neurotoxic side effects of capecitabine, especially in high-risk patients. New-onset neurological symptoms shortly after starting treatment warrant prompt metabolic workup and brain imaging to identify the cause and rule out other conditions. Given the variable presentation of leukoencephalopathy, early imaging is crucial, as timely drug withdrawal often leads to full symptom resolution.

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