

# Gemcitabine and Cisplatin Induced Reversible Posterior Leukoencephalopathy Syndrome: A Case Report

Erkan Dogan<sup>1,\*</sup>, Cemile Ayse Gormeli<sup>2</sup>, Mehmet Fatih Ozbay<sup>3</sup>, Edip Gonullu<sup>4</sup>, Alper Can<sup>5</sup>, Harun Arslan<sup>6</sup>

<sup>1</sup>Department of Medical Oncology, Yuzuncu Yil University Medical Faculty, Van, Turkey

<sup>2</sup>Department of Radiology, Van Training and Research Hospital, Van, Turkey

<sup>3</sup>Department of Internal Medicine, Van Training and Research Hospital, Van, Turkey

<sup>4</sup>Department of Anesthesiology, Van Training and Research Hospital, Van, Turkey

<sup>5</sup>Department of Medical Oncology, Yuzuncu Yil University Medical Faculty, Van, Turkey

<sup>6</sup>Department of Radiology, Yuzuncu Yil University Medical Faculty, Van, Turkey

\*Corresponding author: [dr\\_erkandogan@hotmail.com](mailto:dr_erkandogan@hotmail.com)

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**Abstract Background:** Reversible Posterior Leukoencephalopathy Syndrome (RPLS) is a rare clinic-radiological condition. The clinical characteristics of this syndrome are headache, seizures, visual disturbances, confusion, and changes in mental status and focal neurological signs. The radiological characteristic of RPLS is bilateral symmetrical reversible vasogenic edema in the grey and white matter of the posterior part of the parietal-occipital lobes, consistent with hyperintensity in magnetic resonance imaging and computer tomography scans of the brain. Herein we report RPLS during the therapy with gemcitabine and cisplatin in a female patient with pancreatic cancer.

**Case Report:** A 66-year-old female patient was admitted to the hospital because of abdominal pain. The results of computer tomography scans of the abdomen showed a 6-cm mass lesion in the tail of the pancreas and multiple metastatic lesions in the liver. A 'tru-cut' biopsy of the liver lesion proved to be consistent with adenocarcinoma. A combination chemotherapy regimen consisting of gemcitabine and cisplatin was planned. During this therapy, RPLS developed as a complication. Subsequent administration of chemotherapy was cancelled, and antihypertensive and anti-edema treatments were begun. Following this treatment the patient's symptoms rapidly improved. There was a dramatic decline in vasogenic edema in control MRI scans which were performed a week later. **Conclusion:** Failure to diagnose the RPLS and correct the precipitating cause may result in catastrophic permanent brain injury or even death.

**Keywords:** reversible posterior leukoencephalopathy syndrome, gemcitabine, cisplatin

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## 1. Introduction

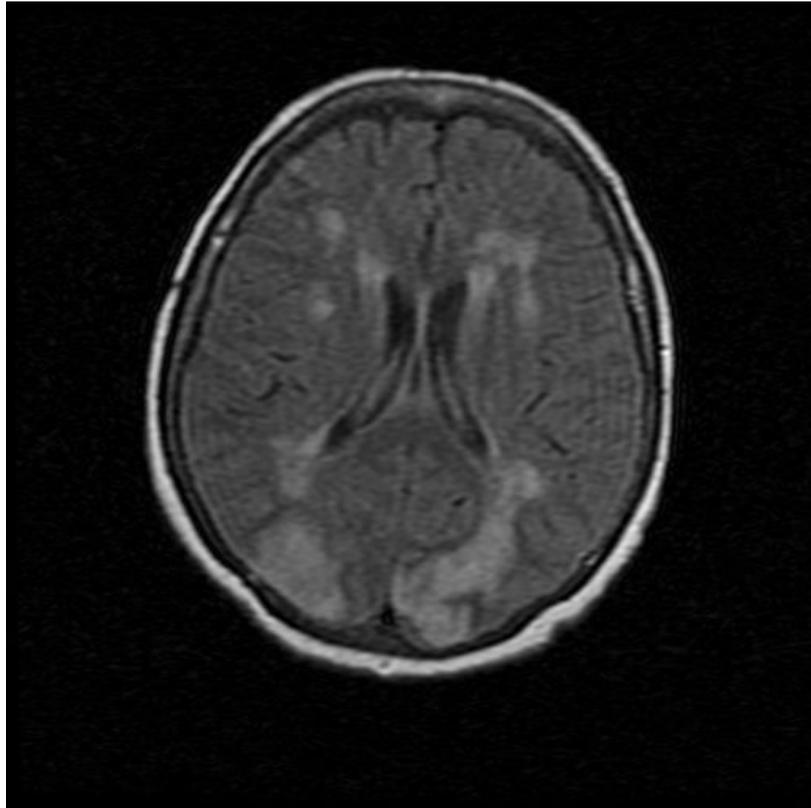
Reversible Posterior Leukoencephalopathy Syndrome (RPLS) was first defined by Hinchey et al. in 1996 [1]. RPLS is a rare clinic-radiological condition, but with each passing day is more frequently diagnosed. The clinical characteristics of this syndrome are headache, seizures, visual disturbances, confusion, and changes in mental status and focal neurological signs [1]. The radiological characteristic of RPLS is bilateral symmetrical reversible vasogenic edema in the grey and white matter of the posterior part of the parietal-occipital lobes, consistent with hyperintensity in magnetic resonance imaging and computer tomography scans of the brain [1].

## 2. Case Report

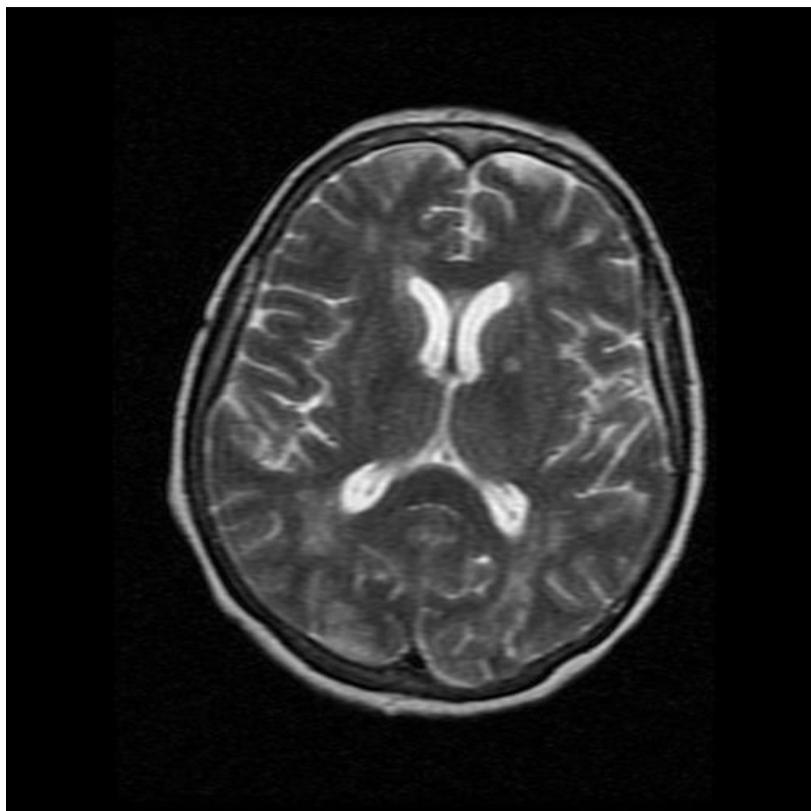
A 66-year-old female patient was admitted to the hospital because of abdominal pain. The results of

computer tomography scans of the abdomen showed a 6-cm mass lesion in the tail of the pancreas and multiple metastatic lesions in the liver. A 'tru-cut' biopsy of the liver lesion proved to be consistent with adenocarcinoma. A combination chemotherapy regimen consisting of gemcitabine and cisplatin was planned. The patient had no history of neurological disease or hypertension. Following the first cycle of chemotherapy, sudden loss of vision, headache, dizziness and problems with balance occurred. Therefore, magnetic resonance imaging (MRI) scans of the cranium were urgently taken. The MRI results revealed a vasogenic edema characterized by diffuse, symmetrical hyperintense areas in T2 and FLAIR images, in the bilateral centrum semiovale, periventricular areas and bilateral occipital lobes (Figure 1). The patient's blood pressure was determined to be 170/95 mm Hg. RPLS has been diagnosed in patients with similar findings. Subsequent administration of chemotherapy was cancelled, and antihypertensive and anti-edema treatments were begun. Following this treatment the patient's symptoms rapidly improved. There was a dramatic decline in

vasogenic edema in control MRI scans which were performed a week later (Figure 2).



**Figure 1.** RPLS Typical Findings in MRI



**Figure 2.** Post-Treatment Findings in Control MRI

### 3. Discussion

Pathophysiological mechanisms in RPLS have not been fully elucidated. No single antineoplastic class or agent, or

any other disease, has been consistently associated with RPLS. Until now, the documented factors that play a role in the etiology of RPLS are systemic hypertension, cytotoxic and immunosuppressive drugs, bevacizumab, cisplatin, gemcitabine, cyclosporin A, cytarabine,

dexamethasone, interferon, metotreksat, rituksimab, sorafenib, tacrolimus, pre-eclampsia/eclampsia, interaction with general anesthesia and renal failure [2,3,4]. Proposed pathophysiological mechanisms involved in the development of this syndrome are cerebral vasospasm and ischemia, with the resulting fluid extravasation causing disturbance of cerebrovascular autoregulation in affected vascular areas of the brain [5,6]. In this syndrome, clinical and radiological findings are nonspecific and do not suffice for the differential diagnosis of the etiologic causes. By eliminating the underlying disease or condition causing RPLS, radiological and clinical findings are typically resolved within 2 weeks [7]. Otherwise, permanent neurological damage may arise with progression to infarction, hemorrhage or even death [3,8].

The typical finding in RPLS is vasogenic edema in the bilateral parieto-occipital region, characterized by hyperintensity in T2-weighted and FLAIR imagings in MRI. Lesions usually disappear with proper treatment. However, the possibility of lesions improving varies depending on the underlying disease, the localization of the lesions and signal characteristics in MRI. Early diagnosis is the most critical factor in the treatment of this syndrome.

#### 4. Conclusion

RPLS is a rare complication of chemotherapy in cancer patients. Accordingly, failure to diagnose the syndrome

and correct the precipitating cause may result in catastrophic permanent brain injury or even death.

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