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CASE STUDY

A case report of posterior reversible encephalopathy syndrome in a patient diagnosed with emphysematous necrotizing biliary pancreatitis

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Posterior reversible encephalopathy syndrome (PRES), a clinical radiological syndrome, is characterized by the abrupt development of neurological symptoms such as headaches, convulsions, altered sensorium, and visual problems. PRES has been linked to a number of risk factors or etiologies, including the use of immunosuppressants or cytotoxins, hypertensive encephalopathy, eclampsia, preeclampsia, and underlying autoimmune diseases. A 41-year-old female was admitted with acute necrotizing emphysematous pancreatitis complicated by posterior reversible encephalopathy syndrome. She remained normotensive on presentation and during the hospital stay. All her investigations were within normal except double-stranded DNA, which came positive. This could explain the immune-mediated mechanism leading to endothelial dysfunction. This case has been presented for its rarity. When acute neurological abnormalities occur in the context of systemic inflammatory conditions, such as acute pancreatitis, it is crucial to take PRES into account.

Keywords: posterior reversible encephalopathy syndrome, emphysematous necrotizing biliary pancreatitis, PRES, pancreatitis, case report

Introduction

Posterior reversible encephalopathy syndrome (PRES), a clinical radiological syndrome, is characterized by the abrupt development of neurological symptoms such as headaches, convulsions, altered sensorium, and visual problems (1). Magnetic resonance imaging shows hyperintensity in T2 and hypointense in T1 representing white matter vasogenic edema. This is mostly a symmetric disorder with asymmetric variants. Symmetric lesions are typically located in the posterior cerebral regions. However, PRES is a misnomer as the edema is also seen in watershed zones other than parietal-occipital regions, thalamus, and sometimes in the anterior circulation. Moreover, the syndrome is not always reversible. Life-threatening complications can develop such as transforaminal cerebellar herniation and focal neurologic deficits, especially if prompt treatment is not initiated (2).

Various risk factors or etiologies have been identified with PRES such as hypertensive encephalopathy, preeclampsia, eclampsia, use of cytotoxins or immunosuppressants and also in underlying autoimmune conditions (3).

Case report

A 41-year-old female was admitted to the surgical ward as a case of Severe Acute Emphysematous Necrotizing Biliary Pancreatitis on conservative management. During the course of the hospital stay, she was intubated for 11 days and successfully extubated.

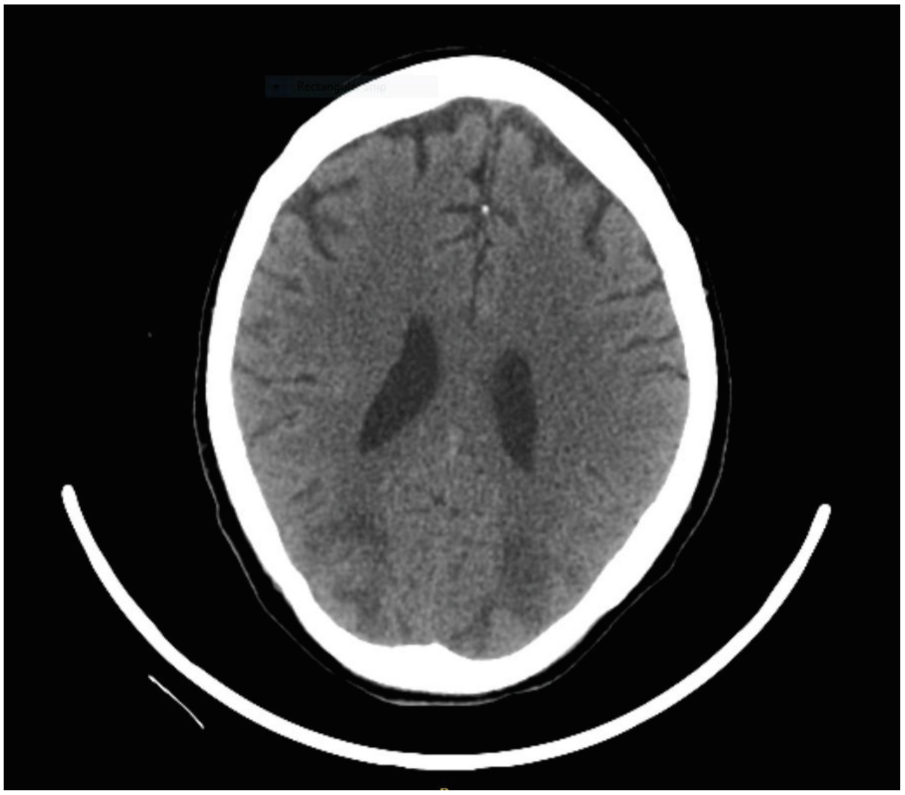

FIGURE 1 | Initial CT brain showing hypodense changes in the bilateral parieto-occipital regions.

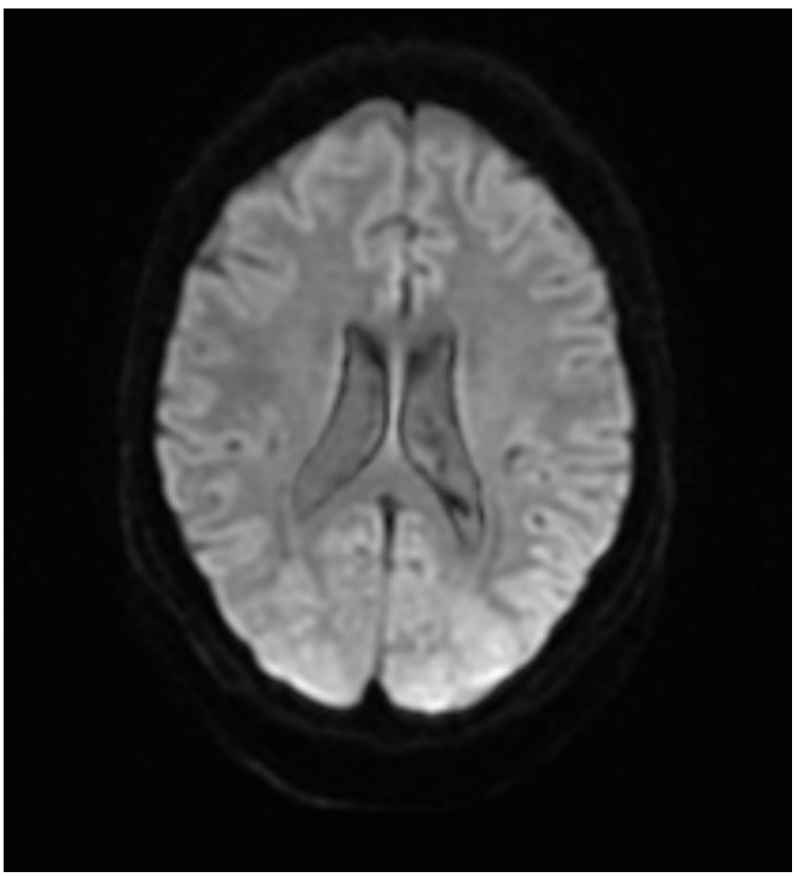

FIGURE 2 | MRI DWI showing diffusion restriction in bilateral parieto-occipital region.

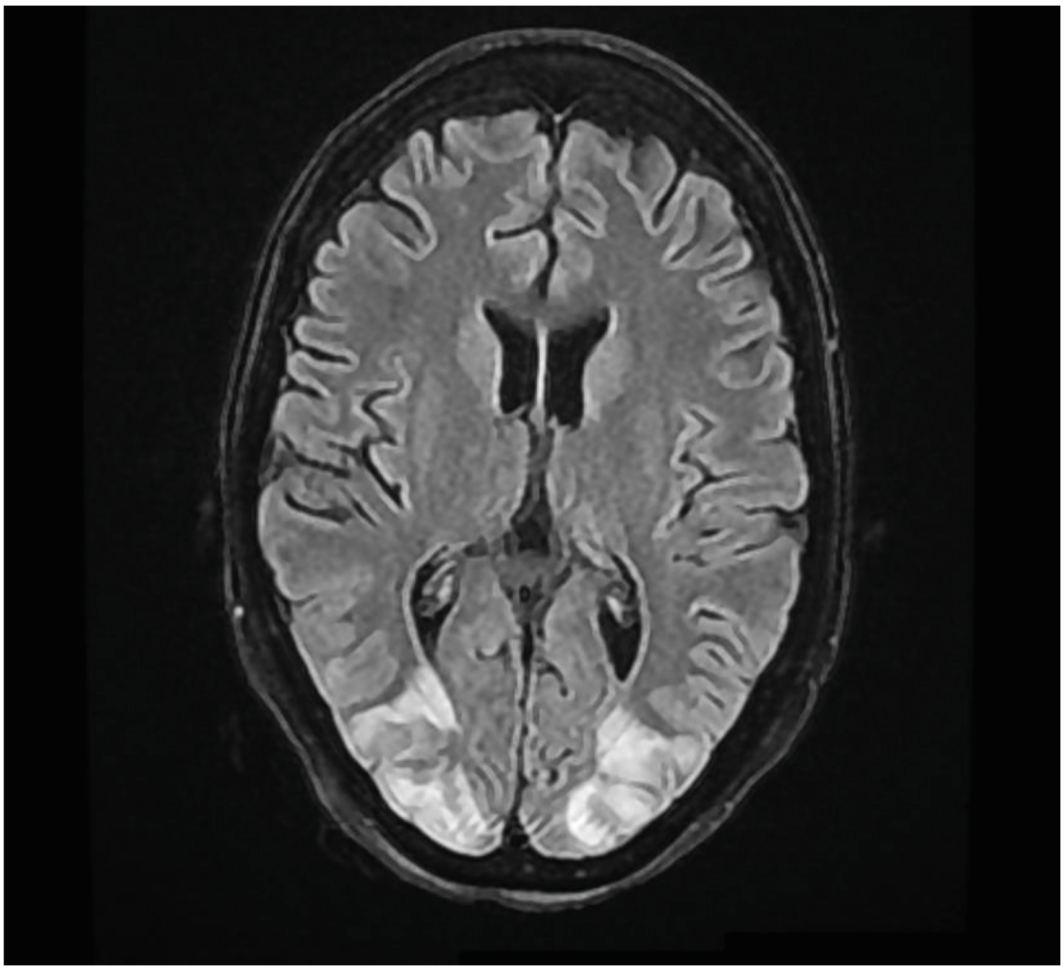

FIGURE 3 | MRI flair image showing signal change in bilateral parieto-occipital region.

On the 56th day, it was noticed during surgical rounds that the patient was not communicating and she was referred to a neurologist. On examination, the patient was conscious, awake, making eye contact, not communicating, not responding to commands. The pupils were 3 mm reacting to light, and the patient was spontaneously moving her eyeballs in all directions. She had no obvious facial asymmetry and was moving all her limbs to pain. Her reflexes were normal and plantar - bilateral flexor.

CT brain (**Figure 1**) and MRI brain (**Figures 2**, **3**) were done, which showed evidence of posterior reversible encephalopathy syndrome. After returning from CT brain, the patient developed 2 episodes of convulsions.

She was treated conservatively with anti-epileptics and angioedema measures. Routine blood investigations were normal while autoimmune workup showed positive anti-dsDNA. Blood pressure remained stable throughout the admission.

The repeat CT Brain (**Figure 4**) done after almost 20 days showed a regressive course of PRES. The patient symptomatically improved and was discharged.

Discussion

The pathophysiology behind PRES is unknown. Various explanations have been proposed like cerebral vasoconstriction resulting in brain infarcts, cerebral auto-regulation failure with vasogenic edema, and endothelial injury with blood–brain barrier disturbance resulting in vasogenic edema. This vasogenic theory explains that development of PRES in cases of accelerated hypertension. The posterior circulation of the brain is comparably less innervated with sympathetic nerves, which is most likely the cause of PRES's preferential involvement of the posterior portion of the brain (4, 5).

At least 20% of patients with PRES have normal blood pressure throughout the course of the disease. Endothelial dysfunction in these patients is probably caused by immune-related mechanisms, such as the secretion of inflammatory cytokines like interleukin 1, tumor necrosis factor-1, and interferon factor gamma.(5)

To the extent of for knowledge, very few cases of PRES associated with pancreatitis have been reported. Murphy et al. and Magno have presented reports of PRES associated

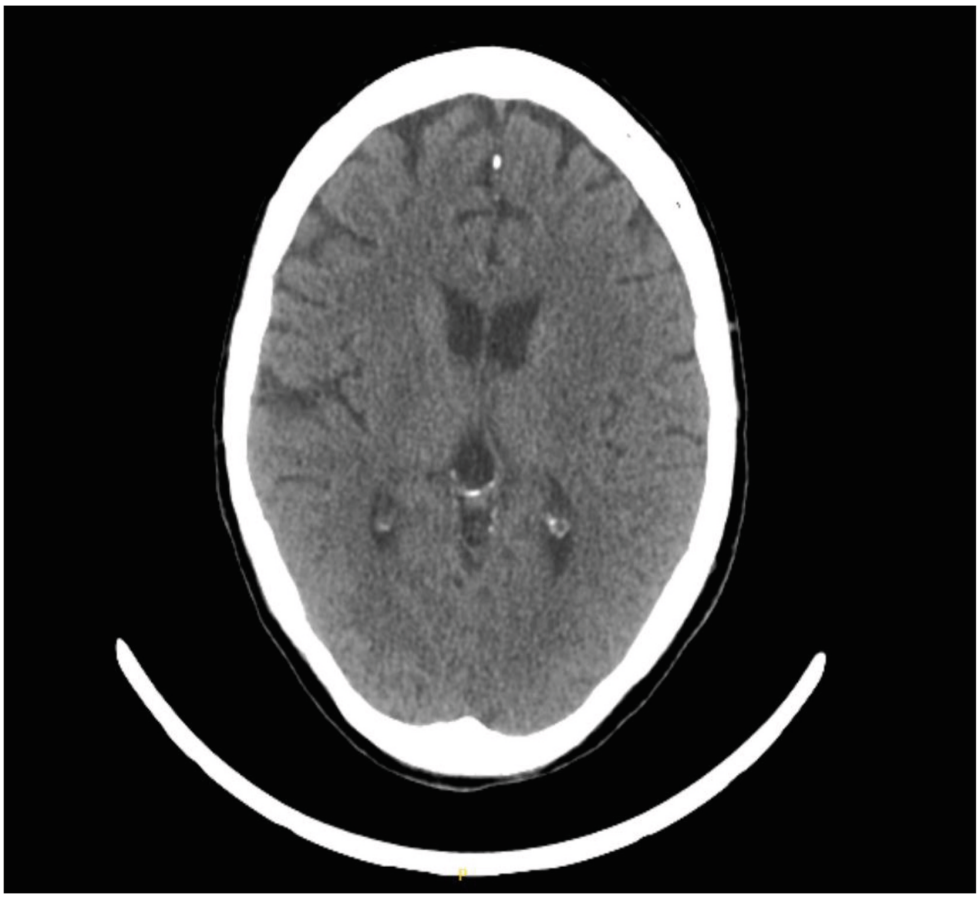

FIGURE 4 | Follow-up CT brain showing regression of previous signal changes.

with pancreatitis due to alcoholism (6, 7). Palmer et al. have presented a case report of PRES associated with pancreatic carcinoma (8).

Posterior reversible encephalopathy syndrome should be taken into consideration when a patient with acute pancreatitis experiences headache, visual impairment, and seizures. Acute pancreatitis may cause cytotoxic and vasogenic edema by damaging secondary cerebral vascular endothelium through both local and systemic inflammatory pathway activation (3).

Our patient presented with Severe Acute Emphysematous Necrotizing Biliary Pancreatitis leading to PRES. She remained normotensive on presentation and during the hospital stay. All her investigations were within normal except double-stranded DNA, which came positive. This could explain the immune-mediated mechanism leading to endothelial dysfunction.

Conclusion

This case has been presented for its rarity. When acute neurological abnormalities occur in the context of systemic inflammatory conditions, such as acute pancreatitis, it is crucial to take PRES into account.

To the extent of our knowledge, this is the first case with emphysematous necrotizing pancreatitis leading to PRES with complete recovery.

Conflict of interest

The authors declare that research was conducted in the absence of any commercial or financial relationships that could be construed as potential conflict of interest.

Ethics statement

As per Emirates health service policy, ethical committee approval is not needed for case reports.

Author contributions

MA: study design and conceptual development. AD: study design and conceptual development. SI: data acquisition and analysis. DK: conceptual development.

All authors contributed to the article and approved the submitted version.

Consent for publication

Written consent for publication is taken from the patient.

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