Case Report

Hydrocephaly secondary to central vein thrombosis in a hemodialysis patient

Habib Emre¹, Yasemin Usul Soyoral², Fatih Mehmet Erdur³, Huseyin Begenik⁴, Refah Sayın⁵

ABSTRACT
Neurological disorders can be observed in hemodialysis patients due to uremic encephalopathy, electrolyte imbalance, infection, medications, glucose intolerance, hypoxia and psychiatric disorders. We present a case of hydrocephalus consequent to central vein thrombosis that is rarely seen in an adult hemodialysis patient and which causes neuro-psychiatric symptoms.

KEY WORDS: Hydrocephalus, Hemodialysis, Thrombosis.

INTRODUCTION
Chronic renal failure (CRF) is related with neurological disorders involving both the central and the peripheral nervous systems. Neurological disorders in hemodialysis (HD) patients can be observed due to uremic encephalopathy, electrolyte imbalance, infection, medications, glucose intolerance, hypoxia and psychiatric disorders.¹ Hydrocephalus may occur in any pathology that impairs the synthesis, circulation and absorption of the cerebrospinal fluid (CSF), and may lead to neuro-psychiatric disorders.² A non-communicating hydrocephalus case due to central vein thrombosis, which is rarely encountered in an adult HD patient, causing neuro-psychiatric findings, has been presented here.

CASE REPORT
Our patient was a 52-year-old female undergoing regular hemodialysis treatment. She had been suffering from behavior disorder, visual and auditory hallucinations, delusions, anxiety, and decreased sleep and appetite for the last six days. On physical examination; she was agitated, confused, disorientated and uncooperative; her pupils were isochoric, papillary light reflex: +/. There was no motor deficits. Deep tendon reflexes were normoactive and pathologic reflexes were absent. Other systemic examinations were normal. On laboratory analyses, there was no electrolyte imbalance and other abnormality. Lumbar puncture revealed no cells, and CSF biochemistry was normal.

Cranial computerized tomography (CCT) and magnetic resonance (MR) imaging showed dilatation in the third and lateral ventricles (non-communicating hydrocephalus) (Fig.1). On EEG, a manifest focal deceleration was observed in the anterior region of the right hemisphere, but no epileptic activity was recorded. A ventriculo-peritoneal shunt (VPS) was performed for hydrocephaly.
Following the ventriculo-peritoneal shunt, there was a dramatic recovery in the neuro-psychiatric symptoms. On the follow-up, edema in the left upper extremity, where the arterio-venous fistula was located, and collaterals on the thoracic wall were observed; CT angiography of the left upper extremity revealed thrombosis on the connection point of the left subclavian vein and the brachycephalic vein (Fig.2). Hydrocephalus was thought to be related to thrombosis. Two months after the VPS procedure, the control MRI revealed significant regression in the hydrocephalus.

**DISCUSSION**

Intracranial or extracranial obstructions, such as VCS obstruction, result in hydrocephalus. The mechanism of hydrocephalus caused by venous obstruction has not been completely explained. The opinion emphasized by the authors is that hydrocephalus occurs as a result of disrupted CSF absorption through the arachnoid villi caused by increased hydrostatic pressure in the obstructed sagittal sinus.

Hooper et al. were the first to report hydrocephalus related to VCS compression secondary to hyperplastic thymus. Similarly, some hydrocephalus cases have been reported due to VCS thrombosis, and bilateral jugular venous thrombosis. One of the common characteristics of these cases is that they are all infants or children. Our case is different as she was a 52 year old woman under hemodialysis treatment. She had a history of right and left jugular vein catheterization and edema was found on the arm with arterio-venous fistula; hence, a CT angiography was performed with the suspicion of central vein thrombosis. On CT angiography, there was obliteration at the intersection between the left subclavian vein and the brachycephalic vein. Hydrocephalus was thought to be due to this thrombosis. According to our knowledge, there is no case on a routine hemodialysis program in the literature that has developed hydrocephalus consequent to central vein thrombosis.

In conclusion, various neurological disorders may be observed in HD patients. The clinical symptoms of these disorders are non-specific and making differential diagnosis is important. In addition to the common causes, in hemodialysis patients with neuro-psychiatric complaints in the presence of central venous thrombosis, hydrocephalus should be considered in the differential diagnosis as a rare cause.

**REFERENCES**