CASE REPORT

Cerebral Sinovenous Thrombosis (CSVT) in a Neonate with Different Manifestations

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Abstract- Cerebral sinovenous thrombosis (CSVT) is increasingly diagnosed in neonates. Despite many studies which have addressed diagnosis and management of pediatric CSVT, diagnosis of CVSD in neonates is difficult. A female neonate born by natural vaginal delivery was diagnosed with CSVT after initiation of seizure. The seizure was stabilized and after performing diagnostic tests, the diagnosis of CSVT was made. This report describes diagnosis of this rare condition in a newborn baby in order to make awareness about this serious condition in neonates.

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Introduction

By recent advances in neuroimaging techniques and development of diagnostic guidelines, cerebral sinovenous thrombosis (CSVT) is increasingly diagnosed in neonates (1). Neonatal CSVT has been reported to occur in 2.6 to 2.69 of every 100,000 living newborns each year; however, this seems to be an underestimation of the reality (2-4). Despite the fact that the clinical outcomes could be devastating, many cases are probable to remain unidentified as there are varying signs and symptoms at the time of manifestation and there are not a consensus on the diagnostic approaches which are implicated by physicians (1,5). Although numerous studies have investigated CSVT in pediatrics (2-3), few ones have studied such an event in the neonates (6-7). We hence aimed to report a neonatal case of CSVT which has occurred shortly after her first challenge with meconium swallow to highlight such an impression for a rapid move in neonatal care setting before it gets too late.

Case Report

A 2-day female neonate born by natural vaginal delivery (NVD) to a 22 years old mother of first gravidity and zero parity was admitted at neonatal intensive care unit (NICU) due to meconium swallow. Gestational age was 39 weeks with no maternal conditions or history of gestational diabetes mellitus (GDM), urinary tract infection (UTI), or hypertension. The 3500 g neonate with height of 50 cm and head contour of 37 cm had an Apgar score of 6 at minute 1 and 7 at minute 5. On physical examination, weak Moro and grasp reflex and absent sucking reflex were observed. No sign of increased intracranial pressure (ICP) including bulged fontanel or papilledema was noted. Right hemi thorax was highly set in comparison to the left side suggestive of the barrel chest and sub-costal and inter costal space were retracted, along with weak auscultation of breathing sounds over the right hemi - thorax; mild murmur (grade II/VI), tachypnea (respiratory rate over 70 per minute), and pulse rate of 150 were also notable. Remainder of the initial assessments was not remarkable.

The patient underwent cardiopulmonary resuscitation (CPR) due to the respiratory arrest and she was finally referred to a tertiary care center with equipped NICU for more evaluation after she was intubated and successfully stabilized. During admission to the NICU, the patient had seizure.

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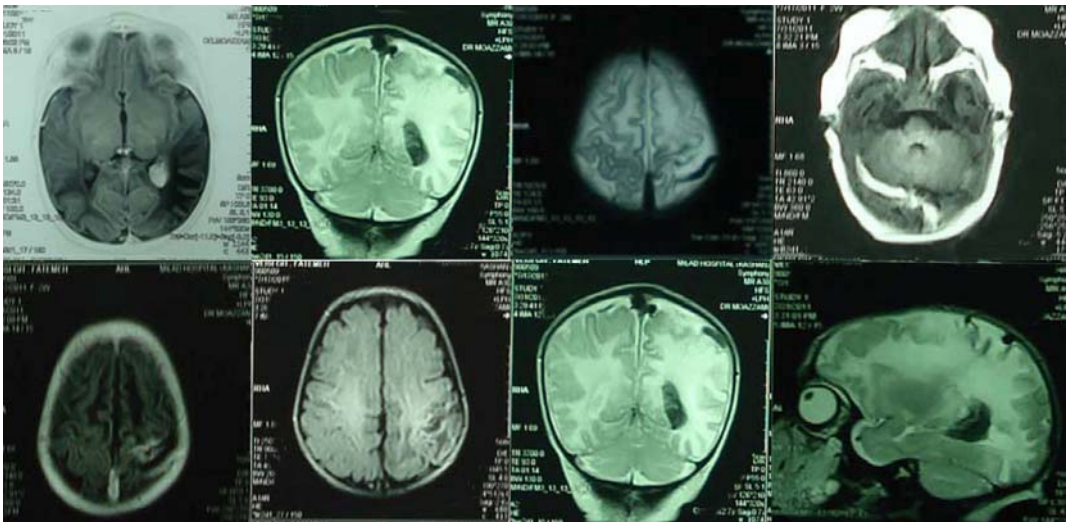

Figure 1. Thrombosis is seen in the superior sagittal sinus posteriorly and in one of the cortical veins in the left and in transverse and sigmoid sinus on the right side. Intraventricular hemorrhage (IVH) is also noted in the left trigone. Ischemic changes due to the sub- acute phase of infarct are seen in the left temporo-parietal region.

Table 1. Early results of laboratory tests

Laboratory test		At the time of birth	At the time of admission (24 hours after birth)
Arterial blood gas (ABG)	pH	7.03	7.24
	PCO_2	35.6	41
	PO_2	7	48
	HCO_3^-	9.7	17
Complete blood count (CBC)	WBC		20.1
	Neut		57.2%
	Lymph		35.3%
	Hb		14.4
	Htc		41.6
	MCV		107.8
	PLT		185’000
	BS		121
Kidney function	BUN		7
	Cr		1.1
Electrolytes	Ca^{++}		10
	Na^+		141
	K^+		3.4
Liver enzymes	AST		140
	ALT		50
	ALP		396

Therefore, phenobarbital was administered through intravenous line; however, as the seizure was not controlled and gaze of the eyes to the right side and pedaling movement of left side of the body set beside the previous manifestations, phenytoin was also added to the initial anti-epileptic treatment. Neurologic consult was requested and asphyxia was confirmed as a result of the seizure. Also, Magnetic Resonance Imaging (MRI) was performed to assess intracranial abnormalities which revealed edematous hemispheres of the brain and protruded sagittal and transverse sinuses especially in the left side with no signs of hemorrhage; it also showed a hyper dense lesion in the occipital lob (Figure1). 8 hours after admission (32 hours after birth), the laboratory tests were ordered of which the results are summarized in table 1. Following admission to the NICU, chest tube was inserted to the right chest which drained purulent secretions. Antibiotic therapy with Ampicillin and Amikacin was initiated intravenously and the neonate was connected to the ventilator for assisted breathing.

The patient went on a healing process from the second day with no further development of any other complications and then was discharged from NICU with prescribed oral phenobarbital and suggesting ascertaining a follow up brain CT scanning for reassurance.

Discussion

Although CSVT is very rare among neonates, its impacts on cognitive and neuromotor development is

remarkable (3,8). It is important to bear this diagnosis in mind to be able to manage the patients. So not uncommonly, CSVT may be missed or delayed to be dealt with and hence leaves irreversible effects (9) and this is why a precaution is essential in this regard. Whether in the early 48 hours of the birth or at the late neonatal period, CSVT presents by a variety of manifestations from a bulged fontanel, irritability, lethargy, poor feeding, or apnea (3,6-8). It may also occur in association with a variety of other co-morbidities including congenital anomalies, sepsis, anemia, or other systemic conditions like respiratory failure (7).

Our case finally revealed its own diagnosis in correlation with a common but rarely reported co-morbidities and that is the onset of the patient's complications with meconium swallow. Although it has been shown that different risk factors, co-morbidities, and complications are associated with CSVT, but our case presented with a different set of signs compared to previous reports. However, she also presented some of the other common signs including asphyxia, respiratory distress, systemic illness, and sinus compression and calvaria molding during the delivery. But if we had paid attention to the possibility of the meconium swallow as a potential trigger of such a disorder, we would then be able to take the patient under observation more quickly with much more time saving. Fortunately we did not miss the patients and all of the essential steps were taken to reach to an acceptable outcome. Impairment of sinus draining flow due to traumatic delivery along with other predisposing factors such as male gender (a source of high production of testosterone) and hypercoagulopathy is believed to be the underlying etiology of CSVT. The personated case, however, did not experience any unusual trauma during delivery. But it seems that dehydration status would predispose her to the low flow of sinus tracts and further developing CSVT.

In conclusion we should recommend that it is wise to give caution to the pediatricians and other primary care physicians to highlight such a diagnosis in their list of suspicions to be able to bring CVST in the circle from the corner. By this, they probably will avoid the tragedy of such a poor prognosis misfortune in the future of neonates' life.

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