

# Pregnancy and Vaginal Delivery in Epidural Analgesia in Woman with Cerebrospinal Fluid Shunt

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## ABSTRACT

*Hydrocephalus is a medical condition characterized by enlargement of cerebral ventricles due to abnormal cerebrospinal fluid accumulation. Hydrocephalic women with cerebrospinal fluid (CSF) shunts are now surviving to reproductive age, but still there are doubts regarding the mode of delivery, analgesia and anesthesia. Postpartal complications are more frequently described in deliveries ended by cesarean section than in spontaneous vaginal deliveries. We present a case of labor in the 32-year old woman, with congenital hydrocephalus and a preexisting ventriculoperitoneal (VP) shunt. After thorough review of current literature, we came to conclusion that without absolute neurosurgical indication or acute development of listed symptoms (headaches, irritability, light sensitivity, hyperesthesia nausea, vomiting, vertigo, migraines, seizures, weakness in the arms or legs, strabismus and double vision) the best way to finish the pregnancy of woman with VP shunt is spontaneous vaginal delivery with the use of epidural analgesia, mediolateral episiotomy and vacuum extraction.*

**Key words:** regional anesthesia, vaginal delivery, ventriculoperitoneal shunt, cesarean section

## Introduction

Hydrocephalus is a medical condition characterized by enlargement of cerebral ventricles due to abnormal cerebrospinal fluid accumulation. In case of congenital hydrocephalus the origin is usually genetic but can be acquired too. It can be diagnosed in utero. The main characteristic of congenital hydrocephalus is ventriculomegaly caused by obstruction of the cerebral aqueduct flow or disorder in the development of cerebral nervous system (Arnold Chiari or Dandy Walker malformation). Acquired hydrocephalus can appear at any age. Main causes of acquired hydrocephalus are obstruction, insufficient absorption or increased secretion of cerebrospinal fluid (CSF). The incidence of congenital hydrocephalus is ap-

proximately 0.4–1.0 in 1000 births and no reliable data are available about the prevalence of acquired hydrocephalus<sup>1</sup>. From the late 1950's, prognosis for hydrocephalus has improved significantly. It happened when surgical approach became a method to obtain CSF homeostasis by implantation of silicone tubing, ventriculoatrial (VA) and later ventriculoperitoneal (VP) shunts. Hydrocephalic women with CSF shunts are now surviving to reproductive age, but still there are doubts regarding the mode of delivery, analgesia and anesthesia<sup>2–4</sup>. We present a case of labor in the 32-year old woman, with congenital hydrocephalus and a preexisting VP shunt.

## Case Report

32-year old woman (165 cm height, 65 kg weight) was admitted to our Labor and Delivery Unit at 39+4/7 weeks of gestation with intact membranes and no contractions. Initial laboratory tests (blood counts, coagulation) were normal. It was known that she has congenital hydrocephalus and a preexisting VP shunt. Her first pregnancy at 18 years of age was artificially terminated. Her medical history included congenital hydrocephalus due to Dandy Walker syndrome. At 9 months of age she had an VA shunt (Hakim valve mechanism) installed. At 14 years shunt was replaced with a VP shunt (Pudenz valve mechanism), because of shunt malfunction and hypertensive hydrocephalus. During this pregnancy she had no neurologic complications. After detailed literature overview, we decided to let her deliver spontaneously, using epidural analgesia, mediolateral episiotomy and vacuum extraction at the end of second stage. Intravenous (IV) fluids were started prior to the procedure of placing the epidural catheter for analgesia. Epidural catheter insertion was performed using an aseptic technique. An 18-gauge Tuohy needle (Perifix®, BBraun Mel-sungen AG, Germany) was blindly inserted into the lumbar epidural space at the L3–4 level in the left decubitus position using loss of resistance (LOR) technique. After ensuring that there was no CSF or blood leak, epidural catheter was inserted without any resistance about 4 cm (up to Th10 level). A test of 2 mL of 2% lidocaine was slowly injected. The epidural catheter was then secured and the parturient placed in the supine position with left uterine displacement with the head of the bed elevated 20–30 degrees and observed for 5 min for the development of sensory blockade changes.

At 4 cm cervical dilatation and upon request for labor analgesia 10 mL of 0.125% levobupivacaine (Chirocaine®, Abbott Laboratories) with fentanyl 2 µg/mL was injected as a bolus, following with continuous infusion of 6–8 mL/h to achieve a bilateral block at <sup>3</sup>Th10 sensory

level. Vaginal birth occurred after 5 hours, at 40 weeks of gestation. A healthy male baby with birth weight 3020 g (49<sup>th</sup> percentile) and length 48 cm (25<sup>th</sup> percentile) was born. There were no complications in the postnatal period for mother or baby. Antibiotic prophylaxis was started after delivery with cephalosporine (3 doses during first 24 hours). Mother and baby were discharged from hospital 8 days after birth.

## Discussion

In current literature postpartal complications are more frequently described in deliveries ended by cesarean section than in spontaneous vaginal deliveries<sup>1–3</sup>. Possible complications include shunt malfunction, shunt failure, and shunt infection. In such cases the cerebrospinal fluid accumulates again and a number of symptoms that indicate urgent neurosurgical treatment develop (headaches, nausea, vomiting, photophobia/light sensitivity, seizures)<sup>5</sup>. There are still doubts regarding mode of delivery, analgesia and anesthesia of woman with ventriculoperitoneal shunt. After thorough review of current literature, we came to conclusion that without absolute neurosurgical indication or acute development of listed symptoms (headaches, irritability, light sensitivity, hyperesthesia, nausea, vomiting, dizziness, vertigo, migraines, seizures, weakness in the arms or legs, strabismus, and double vision) the best way to finish the pregnancy of woman with VP shunt is spontaneous vaginal delivery with the use of epidural analgesia, mediolateral episiotomy, and vacuum extraction<sup>1,3,4</sup>. An antibiotic prophylaxis is optional, but recommended. Collaboration of neurosurgeon, neurologist and obstetrician is essential.

In conclusion, without absolute neurosurgical indication or acute neurologic condition we consider spontaneous vaginal delivery with shortened second stage of labor the best way to finish the pregnancy in patient with congenital hydrocephalus and a preexisting VP shunt.

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## **TRUDNOĆA I VAGINALNI POROD U EPIDURALNOJ ANESTEZIJI KOD TRUDNICE S CERE BROSPINALNIM ŠANTOM**

### **S A Ž E T A K**

Hidrocefalus je medicinsko stanje koje karakterizira proširenje moždanih klijetki uslijed abnormalnog nakupljanja likvora. Danas žene s cerebrospinalnim šantom preživljavaju do reproduktivne dobi, ali još uvijek postoje dvojbe o načinu dovršetka trudnoće, analgezije i anestezije. Poslijeporođajne komplikacije su češće opisane kod poroda sa carskim rezom, nego u spontanih vaginalnih poroda. Prikazali smo slučaj 32-godišnje trudnice, s prirođenim hidrocefalusom i postojećim ventrikuloperitonealnim (VP) šantom. Nakon temeljitog pregleda literature, došli smo do zaključka da bez apsolutne neurokirurške kontraindikacije i uz odsutnost neuroloških simptoma (glavobolja, razdražljivost, osjetljivost na svjetlost, mučnina, povraćanje, vrtoglavica, migrena, epileptički napadi, slabost u rukama i nogama, strabizam i dvoslike) najbolji način dovršenja trudnoće kod žene s VP šantom je spontani vaginalni porod uz korištenje epiduralne analgezije, mediolateralne epiziotomije i vakum ekstrakcije.

