Hydrocephalus and pregnancy

- Cytomegalovirus (CMV) Infection in Pregnancy Resulting in Neonatal Mortality Due to Congenital CMV: A Case Report
- Identification and functional characteristics of a novel splice site variant in L1CAM caused X-linked hydrocephalus
- Differences in brain development and need for CSF diversion based on MMC level: Comparison between prenatal and postnatal repair
- Normotensive Posterior Reversible Encephalopathy Syndrome of an Unknown Etiology
- Risk factors for neural tube defects in the war and siege-affected tigray regional state of ethiopia: a case-control study
- Cavum Septi Pellucidi et Vergae in the Pathogenesis of Prenatally Detected Ventriculomegaly
- Delayed-Interval Delivery in Multifetal In Vitro Fertilization (IVF) Pregnancies: Two Case Reports
- PROFILES FOR SOME KEY CYTOKINES AND AUTO-ANTIBODIES IN LATENT TOXOPLASMOSIS IN ABORTED WOMEN

Patients with CSF shunts may become pregnant, and there are case reports of patients developing hydrocephalus during pregnancy requiring shunting

Any of the shunt problems discussed in the following sections may occur in a pregnant patient with a shunt. With VP shunts, distal shunt problems may be higher in pregnancy. The following are management suggestions modified from Wisoff et al.

Preconception management of patients with shunts

1. evaluation, including:

a) evaluation of shunt function: preconception baseline MRI or CT. Further evaluation of shunt patency if any suspicion of malfunction. Patients with slit ventricles may have reduced compliance and may become symptomatic with very small changes in volume b) assessment of medications, especially antiseizure medications

2. counseling, including:

a) genetic counseling: if the HCP is due to a neural tube defect (NTD), then there is a 2–3% the chance that the baby will have an NTD

b) other recommendations include early administration of prenatal vitamins and avoiding teratogenic drugs and excessive heat (e.g., hot tubs). Neural tube defects, Risk factors

Gravid management

1. close observation for signs of increased ICP: headache, N/V, lethargy, ataxia, seizures… Caution:

these signs may mimic preeclampsia (which must also be ruled out). 58% of patients exhibit signs of increased ICP, which may be due to:

a) decompensation of partial shunt malfunction

b) shunt malfunction

c) some show signs of increased ICP in spite of adequate shunt function, which may be due to increased cerebral hydration and venous engorgement

d) enlargement of the tumor during pregnancy

e) cerebral venous thrombosis: including dural sinus thrombosis & cortical venous thrombosis

f) encephalopathy related to disordered autoregulation

2. patients developing symptoms of increased ICP should have CT or MRI to compare ventricle size to the preconception baseline study

a) if no change from the preconception study, puncture shunt to measure ICP and culture CSF. Consider radioisotope shunt-o-gram

b) if all studies are negative, then physiologic changes may be responsible. Treatment is bed rest, fluid restriction, and, in severe cases, steroids and/or diuretics. If symptoms do not abate, then early delivery is recommended as soon as fetal lung maturity can be documented (give prophylactic antibiotics for 48 hrs before delivery)

c) if ventricles have enlarged and/or shunt malfunction is demonstrated on testing, shunt revision is performed

● in the first two trimesters: VP shunt is preferred (do not use peritoneal trocar method after first trimester) and is tolerated well

● in the third trimester: VA or ventriculopleural shunt is used to avoid uterine trauma or induction of labor

Intrapartum management

1. prophylactic antibiotics are recommended during labor and delivery to reduce the incidence of shunt infection. Since coliforms are the most common pathogen in L&D, Wisoff et al recommend ampicillin 2 g IV q 6 hrs, and gentamicin 1.5 mg/kg IV q 8 hrs in labor and × 48 hrs postpartum

2. in patients without symptoms: a vaginal delivery is performed if obstetrically feasible (lower risk of forming adhesions or infection of the distal shunt). A shortened second stage is preferred since the increase in CSF pressure in this stage is probably greater than during other Valsalva maneuvers

3. in the patient who becomes symptomatic near term or during labor, after stabilizing the patient a C-section under general anesthesia (epidurals are contraindicated with elevated ICP) is performed with careful fluid monitoring and, in severe cases, steroids and diuretics

Safety of Pregnancy and Delivery With Shunted Hydrocephalus

Pregnancy and delivery in women with shunted hydrocephalus (a condition managed by the placement of a ventriculoperitoneal (VP) or ventriculoatrial (VA) shunt to drain excess cerebrospinal fluid) generally proceed safely with appropriate management. However, certain considerations are important:

Key Considerations for Safety: 1. **Monitoring Shunt Function**:

1. The risk of shunt malfunction or infection remains present throughout pregnancy. Symptoms of shunt malfunction, such as headaches, nausea, or changes in vision, may be mistaken for normal pregnancy-related changes. Close neurological follow-up is recommended.

2. **Hydrocephalus and Increased Intracranial Pressure**:

1. Shunt malfunction could result in increased intracranial pressure (ICP), a serious condition that requires urgent intervention. Pregnant women with shunted hydrocephalus should be educated on recognizing signs of elevated ICP and seek prompt medical attention if these occur.

3. **Delivery Method**:

1. **Vaginal delivery** is generally considered safe in most cases. The strain of labor does not typically affect shunt function, and there is no evidence that pushing during labor causes shunt malfunctions.
2. **Cesarean section (C-section)** may be recommended in some cases where complications arise, but it is not routinely required for women with shunted hydrocephalus.

4. **Use of Anesthesia**:

1. Epidural anesthesia is usually safe, but anesthesiologists should be informed about the presence of a shunt to adjust anesthetic management as needed. In rare cases, a shunt in the lumbar region might impact the decision to use an epidural.

5. **Multidisciplinary Care**:

1. Management during pregnancy should involve a team including obstetricians, neurologists or neurosurgeons, and anesthesiologists. This ensures the shunt's functionality is continuously monitored, and any concerns are addressed quickly.

Conclusion: With appropriate multidisciplinary care and close monitoring of shunt function, women with shunted hydrocephalus can generally have safe pregnancies and deliveries [1)].

1)
Discenza M, Papadakis JE, Little S, Madsen JR. Safety of Pregnancy and Delivery With Shunted Hydrocephalus. JAMA Netw Open. 2024 Sep 3;7(9):e2434688. doi: 10.1001/jamanetworkopen.2024.34688. PMID: 39292463.