

Anesthetic Management of a 20 Year Old Pregnant Woman with Arrested Hydrocephalus without Ventriculoperitoneal Shunt, Hypothyroidism and Pregnancy Induced Hypertension.

Dr. Subi Krishnan^{*}, Dr Sreelatha B

^{**}, Department of Anaesthesiology,
Saveetha medical college, Thandalam, Chennai, Tamil Nadu, India.

^{*}Corresponding Author: Dr. Subi Krishnan

Date of Submission: 16-04-2018

Date of acceptance: 02-05-2018

I Introduction

The ventriculoperitoneal (VP) shunt is an effective and mainstay of treatment for hydrocephalus. Here we present a case of 20 year old pregnant female who is a known case of arrested hydrocephalus who was asymptomatic, who refused to undergo VP shunt surgery at second trimester and wanted to proceed with pregnancy.

II Case Report

A 20 year old female who was a primi at 34weeks of gestation was admitted in our hospital for safe confinement. She is a known case of arrested hydrocephalus and hypothyroidism. 2 years ago this patient had undergone total thyroidectomy (for a huge multinodular goiter) in a government institution. Post total thyroidectomy the patient complained of nausea and chronic headache. Magnetic resonance images (MRI) of the head indicated obstructed hydrocephalus in which there was moderate dilation at the bilateral lateral ventricles, predominantly the occipital horns with normal sized fourth ventricle which are features of aqueductal stenosis. Neurosurgical consultation was obtained who advised the patient to undergo ventriculoperitoneal shunt surgery. At that time the patient was not willing to undergo another surgery due to financial and family constraints and was advised regular follow up at the time of discharge, which the patient failed to do so. One year later, she became pregnant and on regular antenatal checkups the patient was advised to undergo ventriculoperitoneal shunt surgery by neurosurgeon at second trimester to prevent any untoward complications of persisting hydrocephalus occurring during the course of pregnancy and labour. After explaining the pros and cons of the surgery, the patient after discussing with her husband and parents of both sides refused to undergo surgery as she was not having any symptoms or signs of obstruction and didn't want to take any risk regarding child's well-being and wanted to proceed with pregnancy. Her family was counselled regarding the same. She was on tablet levothyroxine 150 µg OD for hypothyroidism. At 34weeks of gestation she developed pregnancy induced hypertension and tablet labetalol 100mg BD was added. Tablet levetiracetam 500mg was added for prophylactic purpose in view of PIH and arrested hydrocephalus. After consultation with obstetrician, neurosurgeon and anesthesiologist it was decided to do an elective caesarean section at the completion of 36 weeks under general anesthesia after explaining to the mother, husband and close family members about the risks involved. A written informed high risk consent was obtained which included post op ventilation, neurosurgical intervention if required.

III Anesthetic Management

After pre-operative fasting for 6 hours the patient was posted for surgery. An intravenous line was established with 18G cannula and ringer lactate was started. She was pre-medicated with intravenous administration of inj. Ranitidine 50mg 40 minutes before induction, inj. metoclopramide 10mg was given 30 minutes before induction, pre-induction administration of non-particulate antacid sodium citrate about 30ml was given, tablet levothyroxine 150µg, levetiracetam 500mg, labetalol 100mg was continued in the morning. In the theatre her pre-induction monitors include ECG- L2, SpO₂, ETCO₂ and invasive blood pressure in right radial artery under aseptic conditions after giving local infiltration. Neurosurgeon was on stand by for any untoward complication that can occur due to arrested hydrocephalus. Her vitals prior to induction was HR-92b/m, SpO₂-98% in room air, BP-128/78mmHg. She was planned for rapid sequence intubation and Sellick's maneuver was explained. Pre-oxygenation with 100% was done till end tidal O₂ reached 92%. Induction was carried out by

rapid sequence induction with inj. thiopentone 5mg/kg and inj. rocuronium 1mg/kg. . IV esmolol 0.5mg/kg was given to attenuate pressor response. Endotracheal tube size 6.5mm was inserted, position confirmed by auscultation, capnometry and airway was secured. Her blood pressure raised from 128/78mmhg to 146/90mmhg. Anesthesia was maintained with 50:50 mixture of O₂ and N₂O and isoflurane at 0.6% with intermittent doses of rocuronium. A healthy infant with Apgar score of 10 was delivered. Post baby delivery inj. fentanyl 80mcg was given IV and 15IU of oxytocin was added to the RL on flow. At the end of the procedure under aseptic precautions ultrasound guided bilateral TAP block was administered using inj. bupivacaine 0.25% 15ml on each sides, residual neuromuscular blockade was reversed with neostigmine and glycopyrrolate. Patient was extubated awake, hemodynamically stable and shifted to PACU.

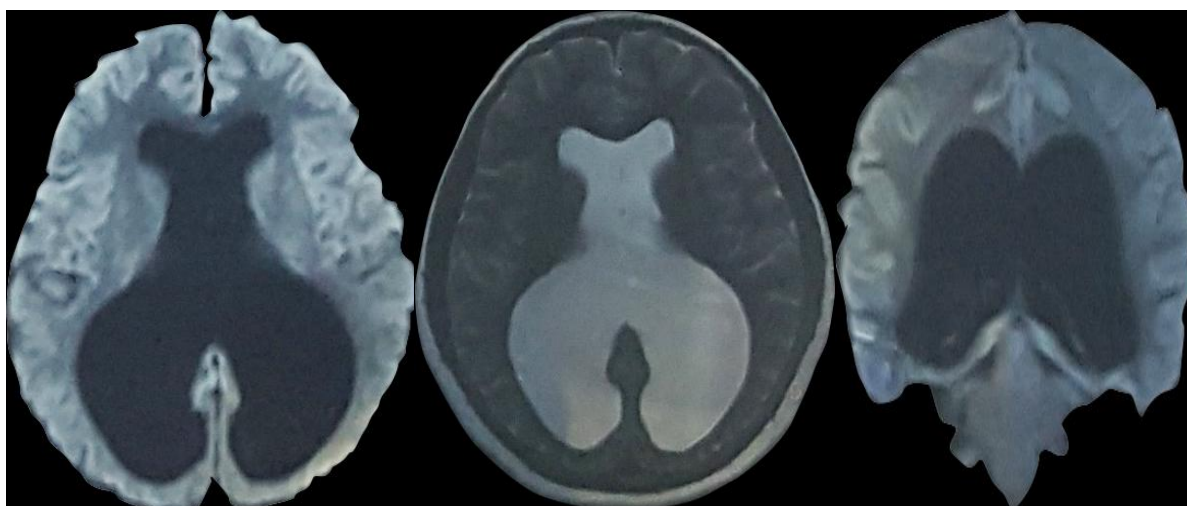


Fig 1: magnetic resonance image (MRI) showing moderate dilation at the bilateral lateral ventricles, predominantly the occipital horns.

IV Discussion:

The VP shunt is the most effective method to provide an improved neurological outcome for patients with hydrocephalus. However in this case the patient refused to undergo VP shunt surgery even after explaining the risks involved if she proceeded with the pregnancy, as she didn't want to take any undue risk and complications occurring to the baby was a challenge itself. Wisoff et al. [1] reported that neurological complications occurred in 76 % of pregnancies in patients with pre-existing shunts, including symptoms of increased intracranial pressure (59 %), exacerbation of seizure disorder (12 %), and severe headaches without increased intracranial pressure (6 %). So it is suggested that all procedures should be consulted by neurosurgeons and obstetricians to achieve better outcome.

To best of our knowledge, this is the first reported case in which an elective cesarean section was performed under general anesthesia in an asymptomatic arrested hydrocephalus patient without a VP shunt. The cesarean section was performed due to obstetrical and neurological indications and as there is increased risk of raised intracranial pressure during normal vagina delivery. General anesthesia is relatively safe and could decrease the intracranial pressure by using proper agents. Fluctuations in blood pressure and heart rate was closely monitored, neurological status was closely monitored by the neurosurgeons. The management must be individualized and multi-disciplined according to the neurological condition and gestational age by obstetricians, neurosurgeons and anesthesiologists.

V Conclusion:

The management of pregnant woman who has not undergone any treatment for arrested hydrocephalus prior to pregnancy and who refused to undergo VP shunt surgery in the course of pregnancy was a challenging case for neurosurgeons, obstetricians and anesthesiologist alike. Female patients with hydrocephalus should be individually evaluated and properly counselled about the importance of VP shunt before getting pregnant. General anesthesia was considered to be the safest option in this type of patients where increase in intracranial pressure can be reduced using proper agents. Therefore general anesthesia is considered to be the safest option for similar case scenarios in the future.

Funding: None

Conflict of interest: None

References:

- [1]. Wisoff JH, Kratzert KJ, Handwerker SM, Young BK, Epstein F (1991) Pregnancy in patients with cerebrospinal fluid shunts: report of a series and review of the literature. *Neurosurgery* 29(6):827–831.
- [2]. Schiza S, Stamatakis E, Panagopoulou A, Valsamidis D (2012) Management of pregnancy and delivery of a patient with malfunctioning ventriculoperitoneal shunt. *J Obstet Gynaecol* 32(1): 6–9. doi:10.3109/01443615.2011.622058.
- [3]. Riffaud L, Ferre JC, Carsin-Nicol B, Morandi X (2006) Endoscopic third ventriculostomy for the treatment of obstructive hydrocephalus during pregnancy. *Obstet Gynecol* 108(3 Pt2):801–804. Doi: 108/3/801.
- [4]. Nikolov A, Surchev Z, Nalbanski B, Diavolov V, Dimitrov A (2008) Pregnancy and delivery in women with cerebrospinal fluid shunt due to hydrocephalus. *Akush Ginekol (Sofia)* 47(2):3–10.
- [5]. Bradley NK, Liakos AM, McAllister JP 2nd, Magram G, Kinsman S, Bradley MK (1998) maternal shunt dependency: implications for obstetric care, neurosurgical management, and pregnancy outcomes and a review of selected literature. *Neurosurgery* 43(3):448–460 discussion 460-441.
- [6]. Hwang SC, Kim TH, Kim BT, Im SB, ShinWH (2010) acute shunt malfunction after cesarean section delivery: a case report. *J Korean Med Sci* 25(4):647–650. doi:10.3346/jkms.2010.25.4.647.
- [7]. Olatunbosun OA, Akande EO, Adeoye CO (1992) Ventriculoperitoneal shunt and pregnancy. *Int J Gynaecol Obstet* 37(4):271–274.
- [8]. Littleford JA, Brockhurst NJ, Bernstein EP, Georgoussis SE (1999) Obstetrical anesthesia for a parturient with a ventriculoperitoneal shunt and third ventriculostomy. *Can J Anaesth* 46(11):1057–1063. Doi: 10.1007/BF03013202.
- [9]. Monfared AH, Koh KS, Apuzzo ML, Collea JV (1979) Obstetric management of pregnant women with extracranial shunts. *Can Med Assoc J* 120(5):562–563.
- [10]. Xiaoliang Wang • Handong Wang • Youwu Fan Management of acute hydrocephalus due to pregnancy with ventriculoperitoneal shunt *Arch Gynecol Obstet* DOI 10.1007/s00404-013-2858-0.

From: * Final year post graduate, ** Associate Professor, Department of anesthesia, Saveetha Medical College, Thandalam, Chennai, Tamil Nadu, India.

Address for correspondence: Dr Subi Krishnan, plot no 13, 14A, vijayam, Shyamala Street, V.G.N Mahalakshmi Street EXTN-111, Perumalagaram, Thiruverkadu, Chennai -77, Tamil Nadu, India.

Dr. Subi Krishnan." Anesthetic Management of a 20 Year Old Pregnant Woman with Arrested Hydrocephalus without Ventriculoperitoneal Shunt, Hypothyroidism and Pregnancy Induced Hypertension.."IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 4, 2018, pp 52-54