Maternal Hydrocephalus in Pregnancy and Delivery
A Report of Two Cases

H Fletcher[1], IW Crandon[2], D Webster[2]

ABSTRACT

We present two cases of maternal hydrocephalus in pregnancy. In one case, the patient had no medical problems and had a spontaneous vaginal delivery of a normal neonate at term. In the second case, the patient had an uneventful pregnancy until 36 weeks when she presented to the labour ward with drowsiness and decreasing consciousness. She only recovered after emergency Caesarean section and revision of her ventriculo-peritoneal shunt. Her neonate although preterm had no anomalies and was sent home soon after birth with the mother.

Hidrocefalia Materna en el Embarazo y en el Parto
Reporte de dos Casos

H Fletcher[1], IW Crandon[2], D Webster[2]

RESUMEN

Presentamos dos casos de hidrocefalia en el embarazo. En uno de los casos, la paciente no presentaba problemas médicos y tuvo un parto vaginal espontáneo de un neonato a término. En el segundo caso, la paciente tuvo un embarazo sin incidentes hasta la semana 36 en que se presentó a la sala de partos con somnolencia y pérdida gradual de la conciencia. Sólo se recuperó luego de una cesárea de emergencia y la revisión de su derivación ventrículo-peritoneal. Su neonato, aunque pre-término, no presentó anomalías, y fue enviado a casa junto con su madre, poco después de su nacimiento.

West Indian Med J 2007; 56 (6): 558

Case 1

A 25-year old Para 1 gravida 2 patient was referred to the University Hospital of the West Indies (UHWI) from a peripheral hospital at term. She had a history of traumatic obstructive hydrocephalus for which a ventriculo-peritoneal (VP) shunt had been inserted five years before and it had been revised twice since. On presentation, she was fully conscious with a pulse rate of 88/minute and blood pressure of 80/40 mm Hg. Her abdomen was obviously gravid compatible with a single term infant in longitudinal lie with cephalic presentation. The fetal heart rate was 132/minute, regular and normal. On admission, she was found to be in early labour with irregular contractions. The vaginal examination revealed a cervix which was 50% effaced and 4cm dilated with the membranes intact. The fetal head was palpated at station -2 and was in the occipito-anterior position. She subsequently went into established labour and had a spontaneous vaginal delivery of a live, term female neonate about five hours after admission. Her labour and delivery were unventful as was her stay on the postnatal ward. Her neonate was examined by the paediatricians who found mild respiratory distress as the only problem. This soon resolved and a thorough central nervous system examination of the neonate revealed no abnormalities.

Case 2

This patient was a 32-year old para 0^{+2} recently married woman with a VP shunt inserted for congenital hydrocephalus first recognized and treated at age 18 years. She had had numerous shunt revisions, the last being 13 years prior to her index pregnancy. The patient also had a history of recurrent shunt infections. Neurosurgical consultation suggested vaginal delivery or in the event of a Caesarean section, packs on either side of the uterus and copious irrigation to avoid blockage of the shunt by blood and liquor. Her pregnancy was uneventful until 36 weeks when she presented

From: [1]Departments of Obstetrics and Gynaecology and Child Health, and [2]Surgery, Radiology, Anaesthesia and Intensive Care, The University of the West Indies, Kingston 7, Jamaica.

Correspondence: Dr IW Crandon, Department of Surgery, Radiology, Anaesthesia and Intensive Care, The University of the West Indies, Kingston 7, Jamaica. Fax: (876) 927-1270, e-mail: ivor.crandon@uwimona.edu.jm

with worsening memory, headache and urinary incontinence of a few hours duration prior to presentation. Her pulse rate was 112/minute, respiratory rate 28/minute, temperature 37ºC, blood pressure 130/80 mm. Hg and the urine was negative for protein. When examined, she was conscious but drowsy and had incoherent speech. She was oriented in person and place but not time. She had normal pupils, full power in all limbs and no neck stiffness. Her abdominal examination revealed a fundal height of 37 cm with a single fetus in longitudinal lie with cephalic presentation. Her vaginal examination showed a low Bishop score with a cervix that was uneffaced with a closed os. Neurosurgical consultation and computed tomography scan determined that she had a possible blocked shunt. Caesarean section with simultaneous shunt revision was recommended. The patient and neonate had an uncomplicated postoperative period.

DISCUSSION

The number of hydrocephalic patients reaching reproductive age has increased due to improvements in diagnosis and therapy including the increased use of unidirectional VP shunts (1–3).

While shunting is extremely useful in relieving symptoms, these procedures are prone to complications such as infections and mechanical obstruction (3, 4). Shunt malfunction occurs in 81% of shunts with obstruction in 56% by twelve years after insertion (5). Both patients apparently had this problem with recurrent revision of their shunt prior to pregnancy. The risk of malfunction increases with procedures such as magnetic resonance imaging, laparoscopy and pregnancy (4). One of the patients presented with headache, a common symptom during the third trimester in any pregnancy (6) and a confounding factor in distinguishing increased intracranial pressure in a hydrocephalic patient with an indwelling shunt from the myriad of other causes of headache. In these cases magnetic resonance imaging (MRI) may help to confirm the diagnosis and avoid radiation exposure to the unborn (2, 3). In pregnancy, the risk of shunt malfunction is high and has been reported to occur in about 50–75% of cases (3, 7, 8). Conversion to a shunt free status by endoscopic third ventriculostomy, although not done in the index cases, would be preferable to shunt revision since it relieves the hydrocephalus and avoids all the potential complications of an indwelling foreign body (9). So far, no adverse effects of MRI on the pregnant woman or the fetus have been proven (10), although the long term effects are uncertain (11). Magnetic resonance imaging is contraindicated in patients with indwelling, usually older shunt systems composed of metallic connectors, as it is for all metallic implants. It is recommended that patients with programmable shunt valves have these reset after MRI since the magneticically controlled mechanism may be disturbed by the magnetic field produced by MRI (12).

The usual recommendation is for vaginal delivery at term (2, 7, 8) but if shunt malfunction occurs, the symptoms can be severe enough to compromise both mother and child requiring intervention by both neurosurgical and obstetric teams (3, 13). Although conservative treatment may be beneficial in selected cases (14), preterm delivery by Caesarean section and shunt revision are usually recommended (13).

REFERENCES

1. Yoffe N, Blumenfeld Z. Gestation and spontaneous delivery in hydrocephalus with ventriculoperitoneal shunt. Harefuah 1990; **118:** 209–10.
2. Cusimano MD, Meffe FM, Gentili F, Sermer M. Management of pregnant women with cerebrospinal shunts. Pediatr Neurosurg. 1991–1992; **17:** 10–3.
3. Wisoff JH, Kratzert KJ, Handwerker SM, Young BK, Epstein F. Pregnancy in patients with cerebrospinal fluid shunts: Report of a series and review of the literature. Neurosurgery 1991; **29:** 827–31.
4. Sesay M, Tentillier M, Mehsen M, Marguinaud E, Stockle M, Crozat P et al. Cerebrospinal fluid shunting: Anesthetic particularities. Ann Fr Anesth Reanim 2002; **21:** 78–83.
5. Sainte-Rose C, Piatt JH, Renier D, Pierre-Kahn A, Hirsch JF, Hoffman HJ et al. Mechanical complications in shunts. Pediatr Neurosurg 1991–1992; **17:** 2–9.
6. Bradley NK, Liakos AM, McAllister JP, Magram G, Kinsman S, Bradley MK. Maternal shunt dependency: Implications for obstetric care, neurosurgical management and pregnancy outcomes and a review of selected literature. Neurosurgery 1998; **43:** 448–61.
7. Mouelhi C, Srasra M, Zhioua F, Ferchiou M, Zinc S, Mariah S. Maternal. hydrocephaly and pregnancy. A new case report and review of the literature. Rev Fr Gynecol Obstet 1994; **89:** 88–90.
8. Depret-Mosser S, Monnier J, Christianens J, Crepin G, Codaccioni X, Decocq J et al. Hydrocephalus with cerebrospinal fluid shunts and pregnancy: 2 cases. J Obstet Biol Reprod 1992; **21:** 955–8.
9. Sood S, Ham S, Canady A. Current treatment of hydrocephalus. Neurosurgery Quaterly 2001; **11:** 36–44.
10. Foulquier JN, Le Breton C. Radiodiagnosis and irradiated pregnancies. Ann Radiol 1997; **40:** 225–36.
11. De Wilde JP, Rivers AW, Price DL. A review of the current use of magnetic resonance imaging in pregnancy and safety implications for the fetus. Prog Biophys Mol Biol 2005; **87:** 335–53.
12. Ortler M, Kostron H, Felber S. Transcutaneous pressure-adjustable valves and magnetic resonance imaging: an ex vivo examination of the Codman-Medos programmable valve and the Sophy adjustable pressure valve. Neurosurgery 1997; **40:** 1050–8.
13. Sova M, Smercka M, Baudysova O, Gogela J. Management of a shunt malfunction during pregnancy. Bratisl Lek Listy 2001; **102:** 562–3.
14. Klienman G, Sutherling W, Martinez M, Tabah K. Malfunction of ventriculoperitoneal shunts during pregnancy. Obstet Gynecol 1983; **61:** 753–4.