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SPINAL ANAESTHESIA FOR CAESAREAN SECTION IN A PARTURIENT WITH A FUNCTIONAL VENTRICULOPERITONEAL SHUNT

Thiago Pessoa de Almeida Sayão
Department of Anaesthesiology, Hospital Central da Aeronáutica, Rio de Janeiro, Brazil
Corresponding author

Claudio Toshio Aguena
Department of Anaesthesiology, Hospital Central da Aeronáutica, Rio de Janeiro, Brazil

Monique Medeiros Vieira
Department of Anaesthesiology, Hospital Central da Aeronáutica, Rio de Janeiro, Brazil

Abstract: We report the case of a 29-year-old primigravida with a functional ventriculoperitoneal shunt (VPS) placed six years prior, admitted for elective caesarean section by maternal request. The patient had been previously assessed by neurosurgery, who confirmed appropriate shunt function. There were no clinical signs of intracranial hypertension. Spinal anaesthesia was performed using 0.5% hyperbaric bupivacaine (12 mg) and morphine (80 mcg), with haemodynamic stability maintained using a continuous infusion of noradrenaline. The procedure was uneventful, with a favourable postoperative course and hospital discharge without complications. This case supports the feasibility and safety of spinal anaesthesia in patients with functional VPS, provided that thorough evaluation and multidisciplinary monitoring are ensured.
Conclusion: This report contributes to the limited literature supporting the safe use of spinal anaesthesia in this clinical context and may help inform future practice.
Keywords: Spinal anaesthesia; ventriculoperitoneal shunt; caesarean section; case report; neuraxial block

INTRODUCTION

Ventriculoperitoneal shunting (VPS) is a standard treatment for hydrocephalus and, when functional, enables patients to lead normal lives, including pregnancy. However, the VPS-pregnancy scenario presents unique clinical challenges, particularly when delivery via caesarean section is chosen, raising questions about the safest and most appropriate anaesthetic technique.

The choice of anaesthesia in pregnant women with VPS demands careful neurological assessment, confirmation of shunt patency, and consideration of potential alterations in cerebrospinal fluid pressure gradients. Regional techniques such as spinal anaesthesia are generally well tolerated but are still approached with caution due to theoretical risks.

The scarcity of scientific publications addressing this specific scenario—anaesthesia for caesarean section in patients with VPS—underscores the need for clinical reports that contribute to safe practice. This paper presents a successful case of spinal anaesthesia in a parturient with a functional VPS and discusses relevant clinical and physiological aspects.

CASE REPORT

A 29-year-old primigravida at 39 weeks of gestation, was admitted for elective caesarean delivery. The caesarean section was performed at maternal request, following discussion with the obstetric team. The patient had gestational diabetes mellitus, managed with lifestyle and dietary changes. She had a history of ventriculoperitoneal shunt placement six years earlier for hydrocephalus of unidentified aetiology, with no recent neurological symptoms. The neurosurgical team had previously assessed the patient and confirmed that the shunt was functioning appropriately.

Pre-anaesthetic evaluation revealed no symptoms of raised intracranial pressure, such as headache, vomiting, or visual changes. Admission vital signs were: blood pressure 130/80 mmHg, heart rate 80 bpm, oxygen saturation 99%, and respiratory rate 15 bpm. Neurological examination was normal. Airway assessment was Mallampati class I.

A peripheral venous catheter (18G) was inserted in the right upper limb prior to spinal anaesthesia. The block was then performed with the patient in the left lateral decubitus position, under standard aseptic technique. Lumbar puncture at the L3-L4 interspace was performed using a 27G Quincke needle, and 0.5% hyperbaric bupivacaine (12 mg) with morphine (80 mcg) were administered intrathecally. Sensory block reached T4, with good efficacy and haemodynamic stability. Additionally, cephazolin (2 g IV) and ondansetron (8 mg IV) were administered. Noradrenaline in-

fusion at 0.05 $\mu g \cdot kg^{-1} \cdot min^{-1}$ was initiated after the spinal injection to maintain blood pressure control. The total dose administered was 90 micrograms.

The caesarean delivery proceeded uneventfully. A healthy male neonate was delivered with Apgar scores of 9 and 10, weighing 3155 g. Following delivery, the patient received oxytocin (3 IU every 3 minutes, for three doses), metamizole (3 g IV), dexamethasone (10 mg IV), and ketoprofen (100 mg IV). She was monitored in the post-anaesthesia care unit with stable vital signs and adequate analgesia and was later transferred to the maternity ward.

No anaesthetic, obstetric, or neurological complications were observed intra- or postoperatively. The postoperative course was favourable, and the patient was discharged as planned. She remained asymptomatic throughout the ward stay and was discharged 48 hours after delivery.

DISCUSSION

Ventriculoperitoneal shunting in pregnant patients presents specific anaesthetic considerations, particularly for caesarean delivery. Concerns relate to the theoretical risk of neurological deterioration due to altered cerebrospinal fluid dynamics following neuraxial blockade.

Nonetheless, published evidence, although limited to case reports and small series, supports the safe use of spinal anaesthesia in patients with functional VPS. Hirs et al. (2012) reported successful spinal anaesthesia in a patient with a VPS and midbrain tumour. Palabiyik et al. (2017) demonstrated the safety of combined spinal-epidural anaesthesia in a woman with a functioning shunt. Reschke et al. (2018) described a caesarean section performed under neuraxial block after external ventricular drain placement.

Our case adds to this growing body of evidence. Other case reports have also described safe anaesthetic approaches in parturients with VPS under varying clinical circumstances [4–9]. In the absence of signs of intracranial hypertension and with a confirmed functional shunt, spinal anaesthesia was both effective and safe. Close monitoring and multidisciplinary care contributed to the positive outcome.

This case highlights the importance of tailored anaesthetic planning and collaborative decision-making in such complex scenarios. In light of the absence of formal guidelines, well-documented case reports such as this remain valuable tools for guiding clinical practice.

CONCLUSION

This case reinforces that spinal anaesthesia may be safely employed in pregnant patients with functional VPS, provided there is no evidence of raised intracranial pressure and that careful evaluation and perioperative monitoring are ensured. Given the limited available literature, detailed reports like this are essential for expanding the knowledge base and promoting safe clinical practice.

ACKNOWLEDGEMENTS AND CONSENT

This case report was prepared with the written informed consent of the patient, who authorised its publication for academic and scientific purposes.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

REFERENCES

1. Hirs I, Grbcic P. Caesarean section in spinal anaesthesia on a patient with mesencephalic tumour and ventriculoperitoneal drainage: A case report. *Korean J Anaesthesiol.* 2012;63(3):263–265.

2. Palabiyik O, et al. Combined spinal-epidural anaesthesia for caesarean section in a woman with a ventriculoperitoneal shunt. *J Anaesth Crit Care.* 2017;7(2):00252.

3. Reschke M, et al. Spinal anaesthesia performed for caesarean delivery after external ventricular drain placement. *Int J Obstet Anaesth.* 2018;36:129–132.

4. Yilmaz F, et al. Successful management of pregnancy and delivery in a patient with VPS malfunction. *Obstet Gynaecol Int J.* 2018;9(4):378–382.

5. Bursać D, et al. Pregnancy and vaginal delivery in epidural analgesia in woman with cerebrospinal fluid shunt. *Ginekol Pol.* 2013;84(12):1085–1088.

6. Goulart AP, et al. Subarachnoid blockade for caesarean section in a patient with VPS: case report. *Rev Bras Anaestesiol.* 2009;59(4):471–475.

7. Wang X, et al. Management of acute hydrocephalus due to pregnancy with VPS. *Arch Gynaecol Obstet.* 2013;287(5):963–966.

8. Whitney PS, Sturgess J. Anaesthetic considerations for patients with neurosurgical implants. *BJA Educ.* 2016;16(7):230–235.

9. Freo U, et al. Anaesthesia for urgent sequential VPS revision and caesarean delivery. *Int J Obstet Anaesth.* 2009;18(3):272–275.