

Emily Sun, M.D., Natasha Sinai Hede, M.D., Jane Huffnagle, D.O., Suzanne Huffnagle, D.O., John Wenzel, M.D., Garrett Gerney, M.D., Christa Davis, M.D. Department of Anesthesiology and Perioperative Medicine, Thomas Jefferson University Hospitals, Philadelphia PA

INTRODUCTION

- dysreflexia (AD), which affects ~85% of patients with SCI at or above the T6 level
- · AD is characterized by unopposed sympathetic discharge below the level of the SCI typically triggered by distention and/or pain from pelvic organs
- Blockade of such stimuli is of utmost importance during procedures such as Cesarean section
- . This case report demonstrates the successful use of spinal anesthesia for Cesarean section for a parturient with C5 SCI and recurrent episodes of AD

BACKGROUND

- anxiety, and paraplegia from SCI at C5 level from MVC in 2001
- Additional history: neurogenic bladder with chronic indwelling foley catheter, recurrent UTIs, nephrogenic diabetes insipidus, chronic anemia, previous COVID-19 infection requiring mechanical ventilation and tracheostomy
- Pt experienced frequent, recurrent episodes of autonomic dysreflexia, presenting with hypertension, flushing, and diaphoresis; most often triggered by constipation and bladder distention
- Pt previously underwent Cesarean delivery under epidural anesthesia
- · During peripartum period, pt admitted on multiple occasions for asthma exacerbations treated with inhaled bronchodilators and steroids
- nephrology, and infectious disease for delivery planning
- Delivery plan was finalized for a repeat Cesarean under spinal anesthesia

Cesarean Section in a Parturient with Spinal Cord Injury and Autonomic Dysreflexia: A Case Report

· Management of a parturient with a spinal cord injury (SCI) presents challenges, including autonomic

· 37 y.o. female G3P1011 at 37 weeks, 2 days gestational age with PMHx of chronic HTN, asthma,

Extensive multidisciplinary discussion between obstetrics, anesthesiology, MFM, pulmonology,



Edwards, C. (2013). Autonomic dysreflexia. In J. L. Benumof (Ed.), Clinical anesthesiology (pp. 387–392). Springer. https://doi.org/10.1007/978-1-4614-8696-1_46



Emily Sun, M.D., Natasha Sinai Hede, M.D., Jane Huffnagle, D.O., Suzanne Huffnagle, D.O., John Wenzel, M.D., Garrett Gerney, M.D., Christa Davis, M.D. Department of Anesthesiology and Perioperative Medicine, Thomas Jefferson University Hospitals, Philadelphia PA

PRE/INTRAOPERATIVE MANAGEMENT

- · ASA standard monitors applied, aspiration prophylaxis given with sodium bicitrate solution, pt assisted into sitting position
- · Single-shot spinal (bupivacaine 15 mg, morphine 150 mcg, fentanyl 10 mcg) performed at L4-L5 interspace with a 24G Pencan needle
- Phenylephrine infusion started at 0.5 mcg/kg/min and titrated to maintain MAP > 65
- · Cesarean proceeded after negative Allis test, delivery occurred without difficulty
- unit of packed red blood cells
- Our patient did not demonstrate symptoms of AD during the intraoperative period.

POSTOPERATIVE MANAGEMENT

- At the conclusion of the case, pt was weaned off phenylephrine infusion and transferred to the postpartum floor
- · Post operatively the patient did develop hypotension, determined to be from urinary bacteremia. This resolved after initiation of appropriate antibiotics on POD 3
- After establishment of home care regimen, pt discharged home on POD 7

Cesarean Section in a Parturient with Spinal Cord Injury and Autonomic Dysreflexia: A Case Report

• Quantified blood loss was 400 mL; the patient was resuscitated with one liter of crystalloid and one

AUTONOMIC DYSREFLEXIA (ADR) ANESTHETIC MANAGEMENT



Diagram 2. Adapted from NYSORA, Autonomic Dysreflexia.https://www.nysora.com/anesthesia/autonomic-dysreflexia/

Postoperative management

- Recover patients with cervical injury in supine position to aid ventilation Continue blood pressure monitoring
- until patient is fully recovered





Emily Sun, M.D., Natasha Sinai Hede, M.D., Jane Huffnagle, D.O., Suzanne Huffnagle, D.O., John Wenzel, M.D., Garrett Gerney, M.D., Christa Davis, M.D. Department of Anesthesiology and Perioperative Medicine, Thomas Jefferson University Hospitals, Philadelphia PA

DISCUSSION & LEARNING POINTS

- Consider invasive BP monitoring
- Intraoperative triggers such as **uterine externalization** should be avoided (as in this case)
- of pelvic organs

REFERENCES

- https://pmc.ncbi.nlm.nih.gov/articles/PMC3296613/

Cesarean Section in a Parturient with Spinal Cord Injury and Autonomic Dysreflexia: A Case Report

According to ACOG, approximately 17,000 new spinal cord injuries occur per year in the US Effective rehabilitation and medical advancements may contribute to the increase the number of patients with SCIs who successfully become pregnant AD was of particular concern in our patient who had both C-spine SCI and repeated episodes of AD throughout her life

AD is characterized by uncontrolled sympathetic discharge typically triggered by visceral stimuli or distention below the level of injury, such as labor or surgery. Disruption of inhibitory modulation in spinal sympathetic neurons > unopposed sympathetic response below level of injury Triggers of AD include bladder distension, UTI, urinary catheter obstruction, pressure ulcers, fecal impactions, pain, pelvic organ manipulation AD manifests as severe hypertension, bradycardia, flushing, sweating, headache, nasal obstruction, spasticity, limb rigidity Severity of AD is directly related to the level of the SCI - i.e., the higher the injury, the more severe the episodes Management of acute AD episode: immediate cessation of the triggering stimulus, rapid blood pressure management, deepening of anesthesia

Spinal anesthesia has been utilized as a safe and reliable anesthetic - possibly superior option vs general anesthesia Spinal anesthesia can provide a superior block against triggering stimuli and avoids the need for airway manipulation Appropriate precautions must be taken for intraoperative management of AD > antihypertensives (e.g. nicardipine, NTG) should be prepared

It is also important to recognize that parturients with history of AD can also experience exacerbations in the postpartum period due to pain from or manipulation

Unnecessary pelvic/cervical examinations should be minimized and pain control with a multi-modal approach prioritized

1. American College of Obstetricians and Gynecologists. (2020, May). Obstetric management of patients with spinal cord injuries. ACOG Committee-opinion/articles/2020/05/obstetric-management-of-patients-with-spinal-cord-injuries 2. Vaidyanathan S, Soni B, Selmi F, Singh G, Esanu C, Hughes P, Oo T, Pulya K. Are urological procedures in tetraplegic patients safely performed without anesthesia? a report of three cases. Patient Saf Surg. 2012 Feb 20;6:3. doi: 10.1186/1754-9493-6-3. PMID: 22348226; PMCID: PMC3296613.

3. E.E Sharpe. (2015, Feb). Anesthetic management of parturients with preexisting paraplegia or tetraplegia: A case series. ScienceDirect. https://www.sciencedirect.com/science/article/pii/S0959289X14001472#b0040 4. Allen, K. (2023, May). Autonomic dysreflexia. National Library of Medicine. In Bookshelf. National Center for Biotechnology Information. https://www.ncbi.nlm.nih.gov/books/NBK482434/ 5. Hambly, PR. (1998, August). Anaesthesia for Chronic Spinal Cord Lesions. Anesthesia. https://www.angelfire.com/hi5/anaesthesia/articles/chronicspinalcord.pdf

M, Patel SP and Rabchevsky AG (2019) Intraspinal Plasticity. nt of Autonomic Dysreflexia After Complete Spinal Cord Injury. Front. Cell. Neurosci. 13:505. doi 0.3389/fncel.2019.00505

