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# A case of spinal anesthesia in a neonate

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## INTRODUCTION

Spinal anesthesia in neonate is used primarily to reduce immediate pain perioperatively as well as post-operative apneic complications due to opioid use.

## CASE DESCRIPTION

A 4.7 kg 6-week old male born full-term with no prior medical history, presented for an incarcerated left inguinal hernia needing repair. In the quest to reduce the exposure of general anesthesia as well as apneic episodes from opioid in this neonate, surgical procedure under spinal anesthesia was implemented.

Method: Patient was brought into the operating room (OR) and placed in the left lateral decubitus position on the OR table. Patient's back was clean with chlorohexidine and draped afterwards. Skin infiltration with local anesthetic was used before the single spinal injection of 0.6ml of 0.75% bupivacaine was placed at the L5-S1 level. Patient was then laid on his back and surgery ensued. The spinal anesthesia was adequate for the duration of the surgery and perioperative course was uneventful.

## Benefits of Using Spinal Anesthesia in Neonates

- ✓ Neuraxial analgesia may improve postoperative outcomes for high-risk neonates who are susceptible to respiratory complications (e.g. preterm born neonates with lung disease and postoperative apnea). Less post-operative apnea from opioid use.<sup>2</sup>
- ✓ Analysis of four trials comparing spinal and general anesthesia in neonates born preterm undergoing inguinal herniorrhaphy found a reduction in the incidence of postoperative apnea only if systemic sedatives were avoided.<sup>2</sup>
- ✓ Minimize the exposure of the developing brain to general anesthesia
- ✓ Exposure to general anesthesia reduces excitation (NMDA antagonists) or enhances inhibition (GABA agonists), may trigger excessive apoptosis in many brain areas.
- ✓ It has been suggested that spinal anesthesia can reduce costs related to postoperative monitoring and hospitalization.
- ✓ Attenuation of stress response.
- ✓ Cardiac stability
- ✓ Reduction in hospital stay
- ✓ Improved surgical outcome

*Adverse effects of spinal anesthesia of the types commonly seen in adults—hypotension, bradycardia, postdural puncture and transient radicular symptoms—are less common in children.<sup>2</sup>*

Fig. 1. Sitting or lateral position for spinal anesthesia procedure.



Image Source: Dadure C, Sola C, Dalens B, Capdevila X. Regional Anesthesia in Children. In: Miller's Anesthesia, 8<sup>th</sup> edition, Chap. 92, Fig. 92-9, p.2706-2756.e7. Downloaded from ClinicalKey.

Fig. 2. Spinal anesthesia procedure in sitting position in 1-month-old girl.



Image Source: Dadure C, Sola C, Dalens B, Capdevila X. Regional Anesthesia in Children. In: Miller's Anesthesia, 8<sup>th</sup> edition, Chap. 92, Fig. 92-8, p.2706-2756.e7. Downloaded from ClinicalKey.

## DISCUSSION

- Neuraxial agents provide full-bodied pain control, have the potential to improve outcomes, and are an important component of the perioperative care of children.<sup>2</sup>
- The control of afferent traffic through neuraxial interventions (epidural or intrathecal delivery) can be utilized in neonates and infants as a sole neuraxial anesthetic technique for abdominal and lower limb surgery or as a supplement to reduce intraoperative general anesthetic requirements and manage peri-operative pain.<sup>1</sup>
- "Single shot" spinal anesthesia provides an alternative to general anesthesia for lower abdominal or inguinal surgery.<sup>3</sup>
- The clinical utility of this technique is limited by the duration of action of intrathecal local anesthetics in neonates however, and conversion to general anesthesia is often required if surgical duration exceeds one hour.<sup>1</sup>

## CONCLUSION

- ❖ **Neuraxial agents provide robust pain control, have the potential to improve outcomes, and are an important component of the perioperative care of children.<sup>1</sup>**
- ❖ **Neonates need a larger dose of neuraxial anesthetic due to high cerebrospinal fluid (CSF) volume and the duration of action is shorter due to rapid turnover of the CSF compared to an adult.**

## REFERENCES

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