Labor Analgesia in Patient with Spinal Muscular Atrophy

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Introduction

- Spinal Muscular Atrophy (SMA) is a hereditary disease caused by degeneration of anterior horn cells in the spinal cord, leading to progressive muscle weakness and atrophy.
- Regional anesthesia is preferred over general anesthesia in patients with SMA because of the risk of prolonged intubation and increased sensitivity to non-depolarizing muscle relaxants.[1]
- In labor analgesia specifically, neuraxial analgesia is utilized due to the possibility of a conversion to caesarian section.
- Another option for labor analgesia is opioid medications, though opioids increase risk of maternal respiratory depression and provide inferior analgesia compared to a labor epidural.[2]

Case Description

- 31 year-old female G1P0 with a past medical history of SMA and Obstructive Sleep Apnea (OSA) presented for scheduled induction of labor.
- She utilizes a power wheelchair for mobility but can stand for transfers.
- Recent sleep study that demonstrated mild OSA and the need for CPAP at night, she was not currently using CPAP.
- She had a recent normal pulmonary function test.
- Anesthesia was consulted upon admission and patient was cleared for epidural analgesia.
- Labor was induced.
- A lumbar epidural was placed, and infusion was with bupivacaine 0.125% with 2mcg fentanyl at 10 ml/hour.
- On reassessment 8 hours later, epidural was not providing sufficient pain relief. Patient elected for epidural catheter removal and placement of a second catheter. A second catheter was placed and provided sufficient pain relief.
- Patient later met criteria for failure to progress and decision was made for primary low transverse caesarian section using epidural.
- The bupivacaine/fentanyl epidural infusion was continued. For additional pain control, 100mcg epidural fentanyl, 100mcg IV fentanyl, and 30mg IV ketorolac were given throughout the procedure.
- A Supernova Mask was used provide positive pressure to assist ventilation.

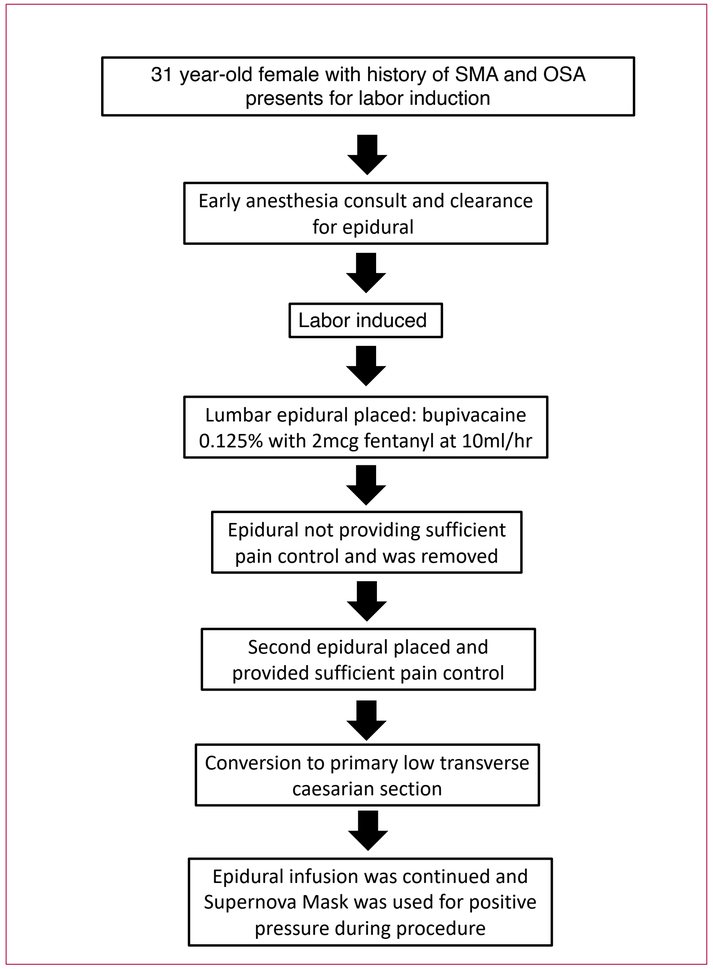

Figure 1. Flow chart of clinical course

Discussion

- Epidural labor analgesia can be given as a continuous epidural infusion (CEI) or as a programmed intermittent epidural bolus (PIEB). CEI was chosen for this patient because of a lower risk of sympathectomy and respiratory compromise.
- However, PIEB has been shown to decrease breakthrough pain better than CEI, which may have contributed to the failed first epidural.[3]
- This case demonstrates that early communication between the obstetric and anesthesia teams is important. Because of the advanced knowledge of the patient, she was able to receive a working epidural well before the decision was made to go to caesarian section. This prevented possible prolonged intubation and allowed the mother to safely experience the birth of her baby.
- The patient had an adequate level of anesthesia from the bupivacaine/fentanyl epidural, so bolus of lidocaine was not utilized. If needed, this should be slowly titrated to ensure no respiratory compromise.
- The patient's poorly controlled obstructive sleep apnea combined with spinal muscular atrophy elevated the risk of respiratory compromise, so positive pressure via Supernova mask was utilized.
- If Supernova was not available, a CPAP or BiPAP would be good options.
- Epidural preservative-free morphine is commonly used at our institution for analgesia after labor converted to Cesarean section but was not given in this case due to the known risk of respiratory compromise.

References

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3. Fidkowski CW, Shah S, Alsaden MR. Programmed intermittent epidural bolus as compared to continuous epidural infusion for the maintenance of labor analgesia: a prospective randomized single-blinded controlled trial. Korean J Anesthesiol. 2019 Oct;72(5):472-478. doi: 10.4097/kja.19156. Epub 2019 Jun 20. PMID: 31216846; PMCID: PMC6781207.