

CORRESPONDENCE

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Postoperative Apnea in a Full-term Infant

To the Editor:—Coté and Kelly recently reported postoperative apnea in a full-term infant without any risk factors.¹ We report a case of apnea after anesthesia for inguinal hernia repair in a full-term infant.

A male infant was delivered vaginally at 39 weeks' gestational age; he had a weight of 2.75 kg and an Apgar score of 10 at 1 min and of 10 at 5 min. Five and one half weeks later (44.5 weeks postconceptual age), he was scheduled for unilateral inguinal herniorrhaphy. At that time, he weighed 4.46 kg. Past medical history was uneventful. The clinical examination was normal. No preanesthetic medication was administered. Anesthesia was induced *via* a mask using 50% nitrous oxide–50% oxygen and a maximum of 1% halothane. After insertion of a venous cannula, caudal anesthesia was performed. The anesthetic solution was a combination of 1% lidocaine with 1:200,000 epinephrine and 0.5% bupivacaine in equal volumes. The injected volume was 0.75 ml/kg. General anesthesia was then maintained with 0.5% halothane in 50% nitrous oxide–50% oxygen as the infant breathed spontaneously.

Monitoring consisted of a continuous display of hemoglobin oxygen saturation (SpO₂), heart rate, ECG, and blood pressure measured with an automated pressure cuff every 5 min. No decreases in hypotension, bradycardia, or SpO₂ were observed during the anesthetic procedure, which lasted 40 min.

The infant was then kept in the recovery room with clinical, ECG, and SpO₂ monitoring until he recovered induced and spontaneous leg motions. Sixty minutes after admission, he left the recovery room, breathing normally. At that time, SpO₂ was 100% in room air. The unusual rapidity of the anesthetic induction led the anesthetist to place this infant under continuous monitoring of respiratory frequency for 24 h (with Vitalmon 5010 R, Kontron Instruments). The thresholds for the alarms were set at 20 s for apnea and 80 beats per min for heart rate. Six hours after the end of anesthesia, *i.e.*, 30 min after feeding, one apneic episode, without bradycardia, was detected by respiratory monitoring. Cyanosis was present. Breathing resumed after a brief period of physical stimulation. A few minutes later, two additional apneic episodes without bradycardia but with cyanosis occurred and were corrected in the same way. Between the three apneic spells the infant breathed regularly (32 breaths per min), without any sign of respiratory distress; the pulse was 150 beats per min. He was normothermic, and laboratory data and chest x-ray obtained at that time were normal. However, the infant was monitored in the intensive care unit for the following 24 h, during which time the clinical course was unremarkable. The infant was discharged from the hospital 24 h after the incident.

Polygraphic studies were carried out 10 days later. The total duration of the studies was 119 min. There was no evidence of pathologic respiratory pattern. No treatment or home monitoring was prescribed.

Apnea occurs commonly in premature neonates, both after surgery and independent of anesthesia. In full-term neonates, apnea is much less common.² Several cases have been reported postanesthesia.^{1,3,4} Of the cases, several of the patients have had identifiable risk factors that would have alerted the anesthesiologist to the possibility of apnea; these included metabolic imbalance, congenital malformation, and twin pregnancy.^{3,4} In the case reported by Coté and Kelly,¹ as in our case, no risk factor was identified before surgery. These two cases are similar except for the results of the polygraphic studies: abnormality of the respiratory center for the case reported by Coté and Kelly and normal

respiratory pattern for ours. However, in our case, because of the short duration of these studies, we cannot rule out the possibility of the same abnormality as reported by Coté and Kelly. In our patient, apnea occurred after caudal anesthesia and inhalation of halothane. Respiratory depression by halothane can hardly be entertained because of the late occurrence of the apnea. For the same reason, depression by the local anesthetic is unlikely 6 h after caudal administration. The maximum plasma concentration is usually 30–60 min after the injection in the caudal space.^{5,6} Furthermore, the motor blockade was relieved when the baby left the recovery room. However, because this apnea occurred 30 min after breast feeding, the episode may have been reflex apnea with stimulation of the laryngeal chemoreceptors by a gastroesophageal reflux.⁷ In conclusion, we confirm Coté and Kelly's finding regarding an episode of postoperative apnea in a full-term infant without known risk factors before surgery.

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