

Pediatric Anesthesiology 2004 annual Winter Meeting
Problem Based Learning Discussion

To proceed or not to is the question

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Objectives:

At the conclusion of the PBLD, the participant will be able to discuss:

1. The clinical predictors of anesthetic complications in children with respiratory tract infections.
2. The implications of reactive airway disease and preoperative bronchodilator prophylaxis for perioperative respiratory airway complications.
3. The implications of different general anesthetic techniques and agents for children with upper respiratory tract infections.
4. The medical and ethical issues related to cancellation of the surgical procedure in children with upper respiratory tract infections.

Stem Case:

An 18-month old boy is scheduled for left inguinal hernia repair and right side exploration.

Past medical history: Full term, history of GE reflux, and reactive airway disease. The patient had one episode of “wheezing” when he had a cold three months ago.

Past surgical history: None.

Hospitalization: None

Allergy: NKDA

Medication: Prevacid daily, albuterol last used three months ago.

Social history: The child is usually in daycare. The father is scheduled to be shipped out to Iraq two days after surgery. The mother has taken time off from work for the surgery. No other supporting family members available.

Review of system: Right Inguinal hernia was discovered one month ago during a routine physical examination. The child also has a five-day history of a runny nose and nonproductive cough.

Physical Examination

Ht: 65cm, Wt: 16 kg.

Vital signs: T. 98.6, HR 110. No laboratory data available as per routine clinical pathway.

Airway: appears adequate, nasal discharge noted.

Chest: Diffuse rhonchi at the dependent areas, which clear after coughing.

Heart: Regular rate and rhythm.

Preoperative Holding area

A playful child who does not appear to be in distress but his parents do appear anxious. The attending anesthesiologist has discussed the risks and benefits of general anesthesia with the parents, especially the increased risk of respiratory complications with the patient's recent history of URI. The parents and surgeon feel strongly about proceeding with the case and accept the risks and benefits and consent to proceed. Preoperative sedative medication was given (10 mg of midazolam mixed with acetaminophen 320 mg) and an albuterol nebulizer treatment was also administered.

Intraop:

The patient was taken to the operating room and standard ASA monitors applied. General anesthesia was induced with a mask inhalation anesthesia (70% of nitrous/oxygen mixture and increment dosage of halothane). An intravenous line was established after the patient became unconscious. Assisted ventilation was commenced, whereupon the patient started coughing and his oxygen saturation level decreased to 78%. 50 mg of propofol was administered and 100% oxygen was used for ventilation followed by the patient's oxygen saturation return to 100%. A direct laryngoscopy was performed and a 4.5 endotracheal tube was inserted without difficulty (no air leak at 20 cm of H₂O).

Diminished breath sounds were noted on the right side. The endotracheal tube was suctioned and copious yellowish mucous was noted. The breath sounds improved on the right side. For the remainder of the procedure, oxygen saturation remained at 100%, with an FiO₂ of 1.0. Fentanyl 50 mcg and Vecuronium 1 mg were administered. Anesthesia was maintained with a 50% of oxygen/nitrous mixture and 0.5% of isoflurane during the procedure. Following closure of the incision, the residual muscle relaxant was reversed with an appropriate dose of neostigmine and glycopyrrolate and the patient was allowed to breath spontaneously with 100% oxygen. During emergence from anesthesia, oxygen desaturation to 60% occurred and bilateral wheezing was noted. An albuterol inhaler treatment was administered through the existing endotracheal tube without improvement.

Epinephrine 10 µg was given intravenously and within 5 minutes the patient's oxygenation improved and the wheezing was resolved. Following extubation, the patient was transported to the post anesthesia care unit (PACU). The parents were brought to the bedside as per our routine practice.

PACU:

Thirty minutes after the patient's arrival in PACU, a nurse notified the attending anesthesiologist that the patient was showing increased exertion in breathing, stridor, and the patient's oxygen saturation decreased to 80% on room air. Racemic epinephrine via nebulizer was administered and oxygenation improved with supplemental oxygen and repeated bronchodilator treatment. The surgeon was notified and agreed to admit the children to a monitored bed for aggressive respiratory treatment and overnight observation.

Postoperative Day #1:

The anesthesiologist visited the child and was informed that the child's respiratory condition had been stable overnight. Child was discharged home in the afternoon.

Key Question:

1. How does one differentiate a mild URI from a more serious infection and what are the respiratory complications in children with URIs undergoing surgery?
2. Is there a difference between the anesthetic risk in children with active URI versus those with a recent URI?
3. What are the predictors for perioperative respiratory complications in children undergoing general anesthesia for elective surgery?
4. How does one manage a child with a history of reactive airway disease? Does preoperative bronchodilator help to decrease perioperative respiratory complications?
5. Are there guidelines to determine whether to proceed with or cancel an elective surgical procedure in a child with an upper respiratory infection? When is it safe to reschedule for surgery after cancellation?

References:

1. Tait AR et al. Risk factors for perioperative adverse respiratory events in children with upper respiratory tract infections. *Anesthesiology* 2001; 95: 299-306.
2. Parnis J et al. Clinical Predictors of anaesthetic complications in children with respiratory tract infections. *Paediatric Anaesthesia* 2001; 11: 29-40.
3. Bordet F et al. Risk factors for airway complications during general anaesthesia in paediatric patients. *Paediatric Anaesthesia* 2002; 12: 762-769.