Child with Refractory Reflux Requiring Upper Endoscopy

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Goals:

After preparing and discussing this case, the PBLD discussant/learner will be able to:

1. Recognize the pathophysiology of gastroesophageal reflux disease (GERD) in children.
2. Assess how GERD will affect the preoperative preparation of a patient.
3. Analyze the advantages and disadvantages of general endotracheal anesthesia vs. deep sedation for upper endoscopy.
4. Propose anesthetic options for upper endoscopy in the pediatric population.
5. Identify the potential complications that can arise during upper endoscopy.
6. Discuss the role of the anesthesiologist relative to the endoscopist.

Case:

History of Current Illness: A 2 year old, 12 kg child is to undergo an upper endoscopy in your institution. He was full term at birth. His mother reports that he was always “spitting up” after feeds and would often seem to choke on his formula. As an infant, he was often very irritable after eating as well. Mom reports that he had an episode of pneumonia at 5 months of age. At that time, gastroesophageal reflux disease (GERD) was suspected and medical treatment with ranitidine was started. The patient’s symptoms improved and the patient was continued on medication until 12 months of age.

What differential diagnosis would you generate from the above presentation?

The patient continued to do well until approximately 4 months ago when he began to resist eating with complaints “that his stomach hurt.” Mom reports that he is not gaining weight and that he will occasionally vomit after eating. She is also concerned that he wakes up frequently during the night. The gastroenterologist would like to perform upper endoscopy to assess the patient for GERD and a potential esophageal stricture.

What is the typical presentation of a patient with GERD? What is the medical management of a patient with GERD? Do any of the medicines have anesthetic implication?

Past Medical History: In addition to the above findings, the patient has a history of mild asthma. He has never been hospitalized. His last asthma attack was one month ago. Mom gives him albuterol nebulizer treatments as needed.

Meds: Albuterol as needed

What other history do you want regarding the patient’s wheezing?

Physical Exam: The patient is a well-developed, well-nourished very anxious male sitting in his mother’s lap. On auscultation, he has normal heart sounds. There is no evidence of wheezing, rhonchi, or crackles. Vital signs are as follows: HR 108, BP 98/56, RR 26, Wt 12 kg.
Will you premedicate the patient? The endoscopist states that he feels comfortable sedating the child without your assistance. How do you respond? When is it appropriate for anesthesia not to be involved in these cases?

The patient is premedicated with midazolam 0.5 mg/kg PO. He is then taken to the endoscopy suite and monitors are placed. The patient becomes agitated during the inhalation induction and begins to cry, cough, and gag. Once the child is “asleep”, an IV is placed.

What technique would you have chosen for induction of anesthesia in this child? Would you have persisted with the inhalation induction or switched to an intravenous approach once he became so agitated?

You have decided to do the procedure with deep sedation using a propofol infusion and a nasal canula that has the ability to measure end-tidal CO₂. You give a small bolus of propofol and start the infusion at 150 mcg/kg/min. Once it is determined that the patient is deeply sedated, the endoscopist inserts the scope and begins the procedure.

Would you have intubated this patient for the procedure? What are the arguments for and against intubation? Does the history of asthma influence your decision?

Approximately 5 minutes into the procedure, the patient begins to cough and buck. The endoscopist is unable to perform the study. You increase the infusion rate after another bolus but the conditions do not improve.

How else could you deepen the patient? What other options are used for sedation during endoscopy? Should local anesthetic be used in the oropharynx? When would you switch to general anesthesia?

You deepen the patient and the procedure continues. After another 5 minutes, the patient’s end-tidal CO₂ tracing is not registering and the patient’s oxygen saturation has decreased to the 80’s and is continuing to drop.

What is your differential diagnosis? How would you treat each of these potential complications?

You begin bag-mask ventilation of the patient with improvement of the saturations to 97%. You have decided to go ahead and intubate the patient for the remainder of the procedure. After a bolus of propofol and muscle relaxant, you attempt to pass a 4.5 ETT, which is met with some resistance. You exchange this for a 4.0 ETT. There is no leak at 20.

What diagnoses could present with these findings?

The patient is noted to be wheezing on auscultation. The end-tidal CO₂ tracing is sloping upward. You give the patient albuterol and steroids with little resolution of the symptoms.

Besides asthma, what could be occurring? How will you manage the patient? What are other options for performing endoscopy under general anesthesia besides intubation?

In the PACU the patient is very slow to awaken. The nurses and endoscopist say usually their patients are awake and drinking within a half hour. The nurses, the endoscopist, and now the mother are all very concerned that something is wrong.

What is the problem here? Is there a problem?
Suggested References:


Further Reading:


