Anesthesia for Ear, Nose and Throat (ENT)

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Introduction:

- The practice of anesthesia for the Ear, Nose, and Throat (ENT) patient is challenging and surgery required high degree cooperation and communication between surgeon and anesthesiologist.

* The anesthesia practitioner is often required to be qualified regarding difficult airway management and must have the knowledge and skills to abnormal and difficult anatomy.

* As a specialty, ENT presents specific Considerations to the anesthetist in regard to the preparation and management of ENT surgical procedures.

Introduction:

Special Considerations for ENT Procedures :

- Shared airway and Positioning.
- Surgical field avoidance.
- Restricted use of nitrous oxide.
- Use of specialized equipment.
- Laser.
- Prevention of endotracheal tube fire.
- High percentage of pediatric patients.
- Minimizing blood loss.

Anesthetic Considerations for ENT Surgeries :

- A true sharing of the airway between the surgeon and the anesthetist : i.e. the surgical ENT field is the same field of anesthesia (airway)

Management includes :

✓ The endotracheal tube should be secured with tape or suture to prevent removal during surgery.

✓ Good monitoring of adequacy of ventilation by assessed the: -

- Observing chest movement,
- Chest auscultation,
- Pulse oximetry,
- End-tidal CO2,
- Inspiratory airway pressure monitoring.

Anesthetic Considerations for ENT Surgeries :

Use of specialized equipment (specially ETT) :

Variety of ETT designs are used:

- to prevent kinking of the ETT
- to prevent obstruction of the ETT when severe angles are necessary
- to prevent fires in the airway during laser therapy
- to provide maximal patient ventilation and safety

Anesthetic Considerations for ENT Surgeries :

these types include :

- Standard endotracheal tubes (acceptable for many ENT procedures)
- Preformed right-angled ETTs
- Oxford ETT tube (less liable to kink)
- RAE tube; designed to be even more 'anatomically' shaped than the Oxford tube.
- Cole ETTs tube: used in neonates. Shouldered, with thickened walls to prevent kinking
- Armored Reinforced ETTs tubes: resemble standard tubes but contain a spiral of metal or nylon in the tube wall.
- Laser-protected ETTs tubes include tubes made totally out of metal and those coated with 'laser proof' substances.

ETT Types :

Laser-protected ETTs tubes

- Cole ETTs tube

ETT Types :

Red rubber type of ETTs

Oxford ETT tube

Standard endotracheal tubes

ETT Types :

Oral RAE tube in-situ

Oral RAE tube

Preformed right-angled ETTs

Tonsillectomy and Adenoidectomy :

- Adenotonsillectomy in the United States is remains the most common pediatric surgery.
- Routine tonsillectomy is generally performed as an outpatient procedure.
- Untreated tonsillar and adenoidal hyperplasia may lead to nasopharyngeal obstruction, causing failure to thrive, speech disorders, obligate mouth breathing, sleep disturbances .

Introduction:

A- In child :

Excision of lymphoid tissue from oropharynx (tonsils) or nasopharynx (adenoids) .

- ✓ **Time :** 20–30min
- ✓ **Pain :** +++
- ✓ **Position:** Supine, pad under shoulders
- ✓ **Blood loss:** Usually small, can bleed post-op
- ✓ **Practical techniques:** South-facing uncuffed Rae tube or reinforced LMA, placed in groove of split blade of Boyle–Davis gag; SV or IPPV

Introduction:

A- In child

Preoperative :

- ✓ Careful history to exclude OSA or active infection.
- ✓ Topical LA on hands (mark sites of veins).
- ✓ Paracetamol/NSAID PO. Or rectally

Introduction:

A- In child Perioperative :

•IV or inhalational induction (sevoflurane)—Guedel airway useful if nasopharynx blocked by large adenoids.

• Intubate (uncuffed RAE) using relaxant or deep inhalational anesthesia, or insert LMA using propofol/opioid or deep inhalational anesthesia.

• Secure in midline, no pack (obscures surgical field).

• Beware surgeon displacing/obstructing tube intraoperatively, particularly after insertion or opening of Boyle–Davis gag.

• T-piece ideal for SV, but ensure reservoir bag always visible.

• Reliable IV access essential, though IV fluids not routine.

Introduction:

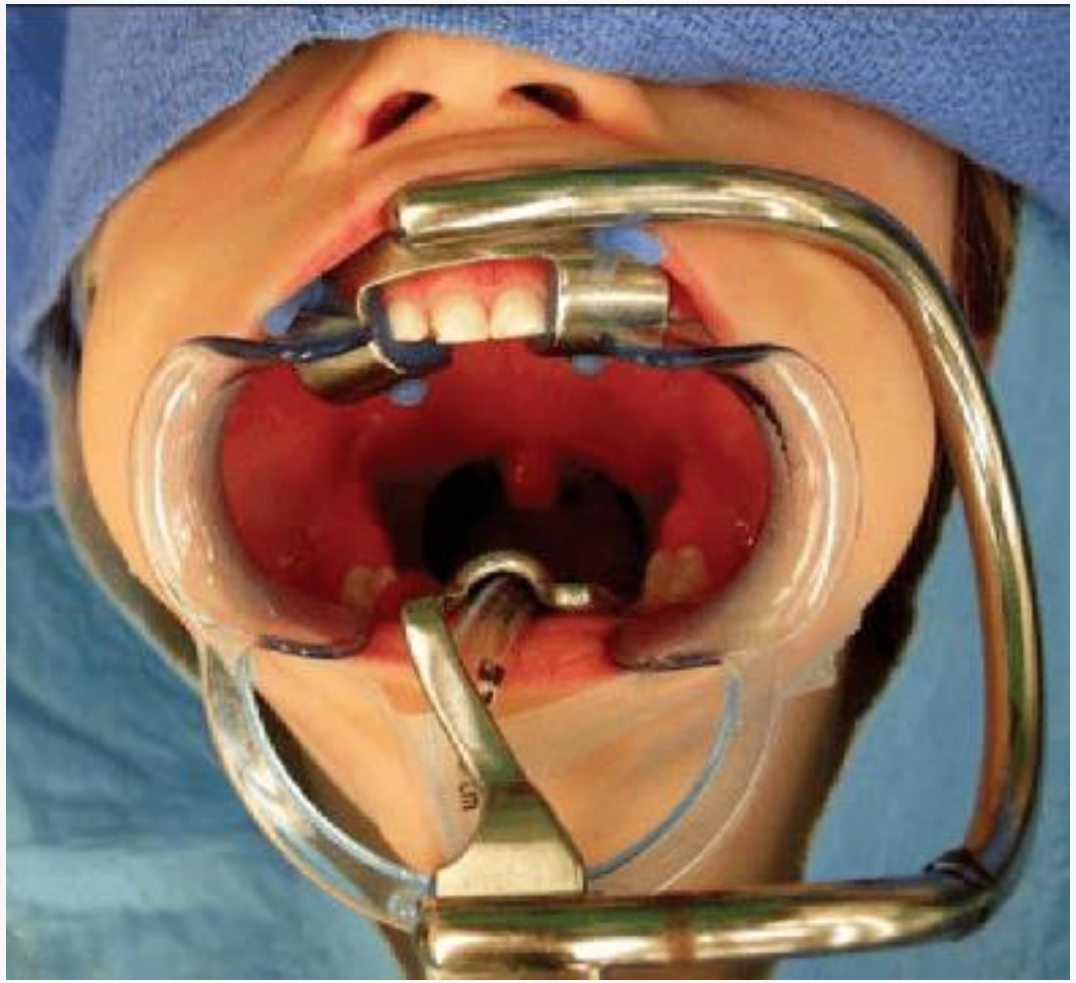
A- In child Perioperative :

Guedel airway

Introduction:

A- In child

Perioperative :



Introduction:

A- In child Perioperative :

- **Analgesia :** with morphine or fentanyl titrated IV plus paracetamol/ NSAID PR if not given preoperatively.
- **Antiemetic :** at least one recommended—dexamethasone or ondansetron.
- **Careful suction** of oropharynx and nasopharynx at end under direct vision (generally done by surgeon).
- **Extubate** left lateral/head-down (tonsil position), with Guedel airway.

Introduction:

A- In child

Post-operative :

- Keep patient in tonsil position until airway reflexes return.
- high quality recovery care essential.
- analgesia with IV morphine/fentanyl initially, then oral paracetamol/ NSAID/morphine. Dexmedetomidine has been used.
- Leave IV cannula (flushed) in place in case of bleeding.
- In small children, a pillow under the chest can be used to provide the necessary tilt.

Introduction:

A- In child

Post-operative :

- avoid blind pharyngeal suction with a rigid sucker, as this may start bleeding from the tonsil bed.
- NSAIDs increase bleeding slightly (especially if given preoperatively).
- LA infiltration of the tonsil bed is not recommended.
- Beware continual swallowing in recovery, a sign of bleeding from the tonsil/adenoid bed.

Introduction:

A- In child

Bleeding after adenotonsillectomy :

- May be detected in recovery or many hours later.
- Loss may be much greater than readily apparent (swallowed blood).
- Senior anesthetist must be involved.

Introduction:

A- In child

Bleeding after adenotonsillectomy :

Problems include :

- hypovolemia
- Risk of aspiration (fresh bleeding and blood in stomach)
- Difficult laryngoscopy because of blood in the airway or edema
- Residual anesthetic effect.
- Resuscitate preoperatively; check Hb cross-match, and give blood, as needed.

Note: Hb will fall as IV fluids administered (dilution).

Introduction:

A- In child

Bleeding after adenotonsillectomy :

Options :

- RSI: enables rapid airway protection, but laryngoscopy may be difficult (blood, swelling)—generally preferred
- Inhalational induction left lateral/head-down: allows time for laryngoscopy but takes longer, and unfamiliar technique to many.
- Use wide-bore gastric tube to empty stomach after bleeding stopped.
- extubate fully awake.

Introduction:

A- In child

Bleeding after adenotonsillectomy :

Options :

- extended stay in recovery for close monitoring.
- Nasopharyngeal pack occasionally needed (secured via tapes through nose) if bleeding from adenoids cannot be controlled. Usually very uncomfortable—patient may need midazolam/morphine to tolerate.
- Check post-operative Hb

Introduction:

B- In adult

As for child, except:

- Usually more painful post-operatively in adult—give morphine in theatre
- IPPV–relaxant technique used more commonly. Mivacurium useful with quick surgeon
- Preoperative oral NSAID avoids suppository use, though may increase bleeding risk.
- Occasionally, patients present with peritonsillar abscess (quinsy).

Now normally treated with antibiotics, and tonsillectomy performed later. If drainage essential because of airway swelling, pus usually aspirated with syringe and large needle under LA infiltration.

Nasal operations :

- Hypotensive techniques (induced hypotension) required to reduce bleeding;
- The patient is positioned 10º head-up.
- Anesthesia may be maintained using either spontaneous or controlled ventilation, depending on the duration of surgery.
- The pharynx should be packed with 2-inch ribbon gauze so that blood, pus or debris does not contaminate the larynx or pass into the stomach.

Nasal operations :

- When surgery has been completed, the pack is removed, the pharynx is cleared and the patient is turned into a lateral position.
- Surgical nasal packing, which used in such surgeries, cause a difficulty in maintaining a patent airway, so, a Guedel airway should be placed in position before the tracheal tube is removed to provide a patent airway, using of LMA, instead of tracheal tube, almost eliminates these difficulties, by leaving the LMA in place postoperatively until the patient rejects it in the recovery room.

Nasal operations :

Induced hypotension :

- It is the deliberate reduction of systemic arterial blood pressure in order to reduce bleeding and facilitating surgery.
- It should be remembered that blood flow to the brain is maintained by autoregulatory vasodilation.

Nasal operations :

Induced hypotension :

- In the coronary and cerebral circulations, maximum vasodilation is reached when the mean arterial pressure decreases to 50 – 60 mmHg {mean arterial pressure ≈ (2 diastolic pressure + systolic pressure) /3}, and further reductions in pressure result in parallel decrease in organs blood flow.
- Induced hypotension may be achieved by a reduction in either systemic vascular resistance or cardiac output.

Nasal operations :

Induced hypotension :

- A decrease in systemic vascular resistance may occur as a result of :

  1) Anesthetic agent (e.g., propofol)

  2) Drug interferes with the sympathetic reflex arc (e.g., phentolamine).

  3) Drug acts on the vessel wall (e.g., sodium nitroprusside). A reduction of cardiac output is less desirable as oxygen delivery may be reduced, but may be achieved using a beta blocker (e.g., esmolol).

Nasal operations :

Indications for induced hypotension :

1) Expected major blood loss. (Nasal surgeries) .

2) Complex neurosurgery.

3) Microsurgery.

4) Intraocular surgery .

Nasal operations :

Indications for induced hypotension :

Induced hypotension should be avoided in patients with :

1) Ischemic heart disease.

2) Fixed cardiac output (e.g., aortic stenosis).

3) Carotid artery stenosis.

4) Previous cerebrovascular accident.

LASER surgery :

- It is used to strip polyps or tumors from the vocal cords accurately and with immediate control of bleeding. There are two major anesthetic problems:

  1) Damage to the tracheal tube : the introduction of cuffed flexible stainless-steel tubes for nasal or oral use has essentially solved this problem. For added safety, the cuff should be filled with water.

LASER surgery :

2) Retinal damage : To avoid this, all personnel must wear protective spectacles to prevent retinal damage. Anesthetists are particularly at risk as they are unable to retire behind the operating microscope during the laser procedure.

LASER surgery :

Sometime a fire on tissue or tube occurs due to laser so there is

Airway fire protocol :

1. Stop ventilation and remove tracheal tube.
2. Turn off oxygen and disconnect circuit from machine.
3. Submerge tube in water.
4. Ventilate with face mask and reintubate.
5. Assess airway damage with bronchoscopy, serial chest x-rays, and arterial blood gases.
6. Consider bronchial lavage and steroids.