Anesthesia for Sinus Surgery

Clinical Case

- A 47 yo woman with a BMI of 30 and a h/o PONV, asthma and well-controlled hypertension is scheduled for a bilateral full endoscopic sinus surgery for chronic rhinosinusitis and nasal polyposis. She asks what are the special considerations for this type of surgery given her medical history.

Background

- One of most commonly performed surgeries
- “low-risk procedure” commonly performed in ambulatory surgery centers
- Independent risk factor for unanticipated admission and early readmission
- Indications include sinusitis, nasal polyposis, resection of nasopharyngeal and pituitary tumors, CSF leak closure, orbital decompression, dacryocystorhinostomy, and epistaxis control

Preoperative Considerations

- ASA I-IV patients seen
- Spans across age groups and affects males and females equally
- CRS patients have depression 20% of time
- Pituitary tumors can affect many systems
- Focus on optimizing intraoperative surgical exposure and minimizing factors that may promote bleeding
- Factors that can complicated controlled hypotension: CAD, poorly controlled hypertension, prior CVA
- Follow ACC and AHA guidelines

Preoperative Considerations

- Patients on beta blockade can lead to exaggerated hypertensive response when given local +epi
- Oral anticoagulants usually stopped 7 days prior to surgery,
- Monitor for NSAIDs and supplements and clinical history (vWD, ITP, liver disease/alcohol abuse)
- Optimize pulmonary status, nearly 50% of patients with CRS and nasal polyposis develop comorbid asthma (many also have hypersensitivity to aspirin and cox-1 inhibitors)

Preoperative Considerations

- Juvenile angiofibromas – preop embolization
- consider perioperative bronchodilators (50% CRS/nasal polyposis patients have comorbid asthma)
- Oral steroid therapy – cover with routine dexamethasone dose
- Assess for OSA, especially in ASC settings
- Assess for difficult airway (Cushing's disease, acromegaly)

Anesthetic Management

- Airway management considerations for facilitating surgical access
- Provision of a clear and still surgical field
- Quick non-stimulating emergence from anesthesia
- Fast-tracking patients for discharge
- Keep BP cuff away from surgeon side and avoid OR table movement
- Avoid PONV which can promote bleeding/hematoma and delay discharge

Premedication, Positioning, Monitoring

- Place IV on side next to surgeon (usually right side) so BP cuff can be away from surgeon
- 20g IV usually sufficient unless case is for vascular tumor
- Versed can be given as normally indicated
- Routine ASA monitors + EEG monitoring if utilizing TIVA
  - Pituitary resections may also require arterial line and lumbar drain
- Patients rarely get cold and may wake up quite warm in long cases
- Tape eyes in way that surgeon can assess for complications
- Arms tucked, pressure points padded

Monitored Anesthesia Care

- Need motivated patient with proper criteria
- Local anesthetic +/- sphenopalatine ganglion block
- Eliminates need for GA: less emergence bucking/straining, shorter OR time, reduced blood loss, less PONV, faster discharge
- More challenging than GA
- Oxygen through mouth, consider precordial stethoscope
- changing levels of stimulation

Airway Management

- Special considerations for obesity, OSA and acromegaly
  - Avoid bag-mask ventilation if possible for patients with known skull-base defects to avoid pneumocephalus
- Under GA, either an oral endotracheal tube or flexible LMA can be used
- Reinforced ETTs can be taped midline or to left
- 90 to 180 degrees turned
- Ensure all connections well secured to prevent disconnect or pullback of ETT/LMA

Airway Management

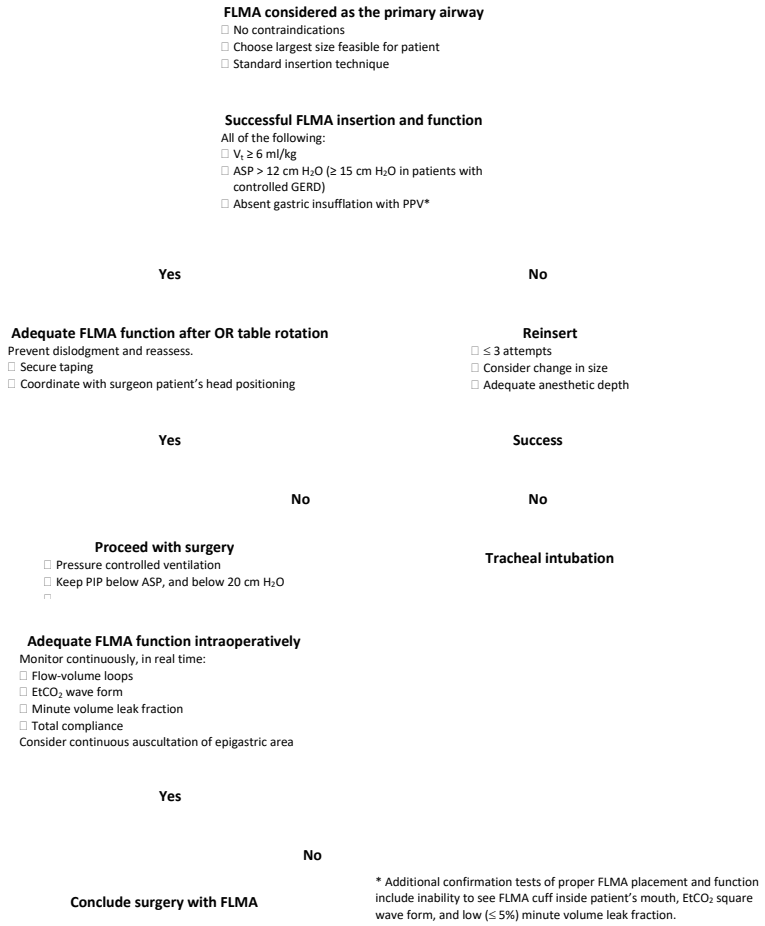
- Tracheal intubation performed more frequently but FLMA represents first choice for airway management barring contraindications
- Retrospective and prospective studies show:
  - Decreased incidence of upper airway trauma and adverse respiratory events
  - Improved quality of surgical field due to more easily attainable stable plane of anesthesia and controlled hypotension
  - Smoother and faster emergence from anesthesia
- Properly placed LMA seals lower airway from blood, secretions, irrigation fluid and surgical debris
- Avoids need for OG tube and neuromuscular blockade
- Keep mean airway pressure < 15 cm H20 if using PEEP
- Maintain normocapnia

Airway Management

FLMA criteria:

- TV > 6ml/kg
- Airway Seal pressure > 12 cm H20
- Absent gastric insufflation

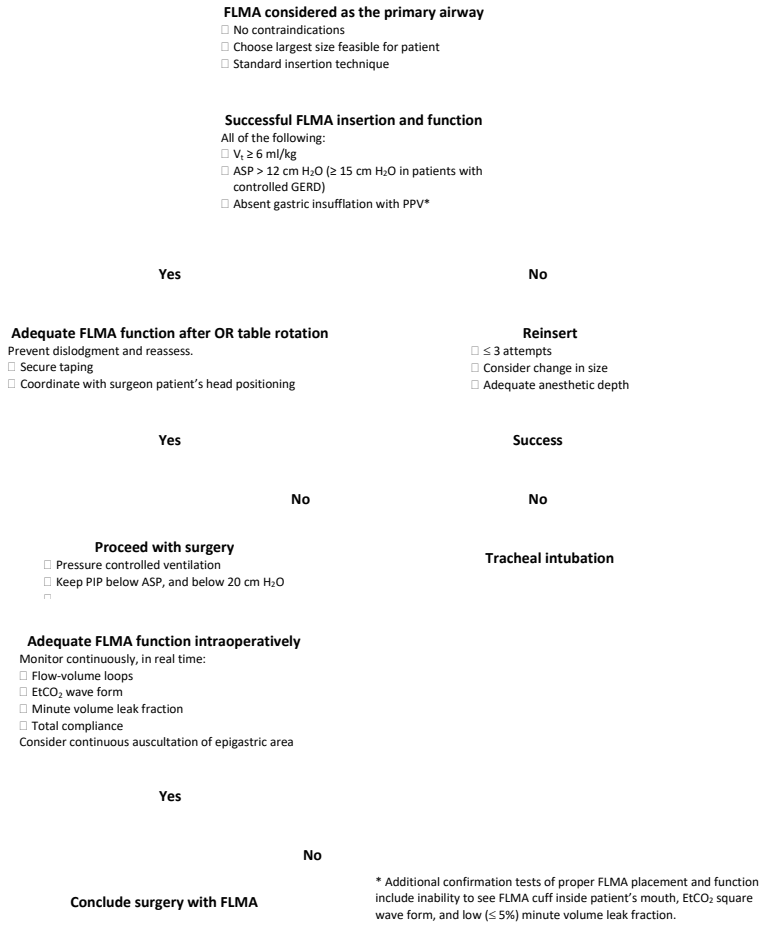
  - Study with 685 patients showed 92.6 overall success rate
  - Low ASP and multiple attempts main risk factors for failure



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Airway Management

- When following criteria, most malpositioning detected before surgery start with true intraoperative failure at 0.75%
- Gastric insufflation 0.15%
- If FLMA position is stable then changes in TV, leak, compliance could represent light plane of anesthesia



Induction and Maintenance

- Versed often used as premedication
- Cefazolin for antibiotic and dexamethasone 8mg to 12mg to decrease tissue swelling and for PONV (also covers stress dose if patient on chronic steroids)
- Standard induction (no muscle relaxant if using FLMA)
- TIVA is anesthetic of choice for maintenance
  - Compared to balanced and inhalational techniques, TIVA has superior hemodynamic stability, better and quicker recovery times, faster return of cognitive function, decreased incidence of PONV, and improved patient satisfaction
  - If inhalational anesthetic chosen, sevoflurane may lead to less coughing upon extubation than desflurane and less somnolence and PONV compared to isoflurane

Optimizing Surgical Field

- Elevate head of bed 15-20 degrees, topical decongestion of mucosa, injectable vasoconstrictors
- Best surgical field is with TIVA (prop 90-150 mcg/kg/min and remi 0.1-0.3 mcg/kg/min)
- MAP 60-70 mmHg unless contraindicated
- Studies on MAP and blood loss inconclusive
- Prospective study of 180 patients showed blood loss best predicted by severity of preexisting sinus disease and duration of surgery

Optimizing Surgical Field

- Proper anesthetic management can decrease duration of surgery
- Prop-remi TIVA has negative chronotropic and inotropic effects which is desired as opposed to vapor-based anesthetics especially in conjunction with vasodilators
- Remi more effective than fentanyl and alfentanil for intraoperative hemodynamic stability and better post-operative recovery and discharge
- Dexmedetomidine equivalent decrease in HR and MAP as remi or esmolol but causes more somnolence and prolonged recovery room stay
- Perioperative beta blockade improves operating conditions

Emergence from Anesthesia

- Rapid emergence without bucking or coughing/straining and with full return of protective airway reflexes to prevent laryngospasm
- FLMA in lieu of ETT facilitates smooth awakening and can lessen level of anesthesia towards end of surgery
  - If using ETT, deep extubation not advised due to higher risk of laryngospasm in setting of blood in the airway
  - Can consider bailey maneuver (exchange ETT for LMA under deep plane of anesthesia) or wake up on remifentanil infusion to promote smooth extubation (0.05 to 0.1 mcg/kg/min)

Fast-tracking patients for discharge

- Immediate recovery room period usually uncomplicated (0.5% complication rate)
  - CSF leak 0.09%, Orbital injury 0.09%, hemorrhage needing surgery 0.1%,
  - Age (over 50), duration of surgery (>80 min), and requirement for nasal packing carried a statistically higher risk of unanticipated hospital admission
- PONV reduced with TIVA
- Postoperative pain usually mild
  - Standard of care is to supplement GA by infiltrative submucosal LA
  - Sphenopalatine ganglion block studies inconclusive
  - Postoperative analgesia usually easily facilitated by IV fentanyl and quick transition to PO pain med. Value of IV Tylenol use currently appears to be uncertain
- Early BP control is important to prevent bleeding and is most often attained with IV labetalol

Conclusions

- Anesthesia management for ESS involves wide range of procedures which share many unique anesthesia-related considerations
  - Clear and still surgical field
  - Smooth emergence from anesthesia
  - Value of TIVA and flexible LMA

References

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