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# POST-TONSILLECTOMY BLEED

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## Background:

- General Considerations
  - Postadenotonsillectomy bleeding typically occurs either in the first 24 hours (primary bleeding) or 5-10 days postoperatively (secondary bleeding).[1-4]
    - Primary bleed: Occurs within the first 24 hours, typically due to inadequate surgical hemostasis. Obesity, recurrent tonsillitis, "hot" electrosurgical cautery dissection techniques & older age (>5 years) are associated with an increased risk of primary bleed.
    - Secondary bleed: typically occurs 5-10 days postoperatively when the eschar falls off of the tonsillar bed.
  - Approximately 75% of postadenotonsillectomy bleeding cases occur within 6 hours of surgery.[1-3]
  - The most commonly reported perioperative adverse event is hypoxemia.[2,4]
  - Postadenotonsillectomy bleeds are typically not from an arterial source, and usually result from venous "oozing".[4]
- Patient Considerations
  - Postadenotonsillectomy is considered a surgical emergency.
  - Patients are frequently frightened, and are considered a full stomach due to swallowed blood. They can be profoundly hypovolemic from poor PO intake as well as acute blood loss.
- Associated Comorbidities/Syndromes
  - No specific associated comorbidities or syndromes.

## Anesthetic Planning:

- Pre-Anesthetic Evaluation
  - Review of the patient's medical history with identification of any comorbidities.
  - Review of the anesthetic record from the primary adenotonsillectomy.
  - Airway Assessment:
    - Review of airway documentation from the original adenotonsillectomy (if readily available)

            - However, even if the patient was deemed an "easy intubation" on initial presentation, the patient now may be a difficult airway secondary to edema or blood in the oropharynx.
        - Visual inspection of the airway/facial anatomy and assessment of the current rate of bleeding.
    - Assessment of volume status:
        - Elicit history of:
            - episodes of dizziness or lightheadedness.
            - Oral intake and urine output
            - Overall activity level
        - Physical examination: heart rate, blood pressure, skin turgor, capillary refill time, etc.
    - Additional labs/tests indicated during work up (do not delay surgery waiting on results)
        - CBC: Hemoglobin/hematocrit should be interpreted in the setting of the patient's overall volume status.
        - Consider sending off a type & crossmatch.
    - Discussions to have with surgeon/family (if time allows):
        - Code status
        - Possibility of blood transfusion if bleeding is severe or the patient is unstable.
        - Back-up airway plan(s)
        - Possibility of post-operative intubation
- Specific or Unique Room Set-Up Requirements
    - Airway
        - Multiple laryngoscope blades.
        - Styletted endotracheal tubes (ETT).
        - Video laryngoscope: consider using it to confirm ETT placement, especially in a patient with a difficult airway.
        - Tracheostomy equipment readily available.
    - Medications/Infusions
        - Induction medications appropriate for rapid sequence induction (RSI) of general anesthesia.
            - Propofol/ketamine/etomidate.
            - Succinylcholine/rocuronium.
        - Short acting opioid (i.e. fentanyl).
        - Vasopressor bolus/infusion for hypotension if needed (i.e. phenylephrine).
        - Dexamethasone 0.5 mg/kg (up to 10 mg).
        - Ondansetron 0.1-0.15 mg/kg (up to 4 mg).
    - Monitors/miscellaneous
        - 2 large bore suctions.
    - Blood Availability
        - Type and crossmatch
        - May need uncrossmatched blood products in severe hemorrhage.
    - PICU Bed Availability: may be necessary in severe hemorrhage.

## Intraoperative Considerations:

- General:
    - In case of need for surgical airway, the surgical team should be present in the operating room (OR) for induction.

  - Surgical emergency: Do not delay transferring the patient to the OR if no peripheral intravenous (PIV) access is obtained in the Emergency Department. A pre-induction PIV can be placed in the OR prior to induction of general anesthesia.
- Induction:
  - 2 large-bore suction catheters readily available with suction on prior to the induction of anesthesia.
  - Full stomach precautions – consider RSI with cricoid pressure.
    - Ketamine/etomidate if there is concern for profound hypovolemia.
    - Propofol may be used in decreased doses.
    - Rocuronium or succinylcholine.
    - Downsized ETTs with stylettes.
  - Consider decreasing the dose of induction agents to avoid profound hypotension in the setting of hypovolemia.[1,3]
  - Larynx may be difficult to visualize owing to bleeding tonsillar bed and/or blood clots in the oropharynx.
  - Consider head down or left lateral position during preoxygenation to allow for pooling of blood and/or secretions in the oropharynx.
  - Patient will typically be hypovolemic, consider a pre-induction fluid bolus with 20 mL/kg of isotonic fluid if time allows.
- Positioning:
  - Supine, typically with bed turned 90 degrees.
- Maintenance: these are typically short cases.
  - Either a volatile agent or total intravenous anesthesia may be used for maintenance of general anesthesia at the discretion of the anesthesiologist.
  - Dexamethasone 0.5 mg/kg (up to 10 mg) for airway edema and as an anti-emetic.
- Hemodynamic/Physiologic goals:
  - Hgb/Hct should help guide transfusion need/goals.
  - Heart rate & blood pressure can be used as marker of volume status.
    - Hypotension will most likely be due to hypovolemia, treat with isotonic fluid and/or albumin boluses.
- Surgical Considerations:
  - Surgeon may manipulate airway for mouth gag placement to examine the oropharynx; watch for inadvertent endotracheal tube dislodgement. Ensure ETT is well secured. Anticipate neck extension when choosing ETT size.
  - Decrease $FiO_2$ for prevention of an airway fire in anticipation of possible cautery of bleeding vessel.
- Emergence/Disposition:
  - Propylactic anti-emetic is indicated (i.e. ondansetron).
  - Given full stomach, stomach contents should be emptied with large bore orogastric tube.
  - The patient should be fully awake with intact airway reflexes prior to extubation.
- Post-op Care:
  - Should continue to monitor for rebleed. Consider admitting the patient overnight.
  - If massive transfusion is required, the patient may need to go to the PICU postoperatively.
  - PONV is likely.

## Case Specific Complications/Pitfalls

- Hypotension on induction:
    - Compensatory catecholamine surge in response to acute blood loss may mask signs and symptoms of hypotension due to peripheral vasoconstriction. Therefore, profound hypotension may occur with induction of general anesthesia due to anesthesia-induced vasodilation.[1]
    - If time allows, consider pre-induction fluid resuscitation (20 mL/kg of isotonic crystalloids and/or colloids) to mitigate severe hypotension.
- Severe Bleeding:
    - A patient spitting up bright red blood may hemorrhage large volumes very quickly.
    - Severe hemorrhage may be temporarily controlled with carotid pressure ipsilateral to side of bleeding source.[1]
    - Coagulation studies may be necessary if no obvious bleeding vessel is identified.
- Judicious use of opiates:
    - The surgery is limited to the site of bleeding, thus these procedures are typically not overly painful.
    - Consider small doses of a short-acting opioid (i.e. fentanyl) to facilitate rapid emergence and recovery.

## References


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2. Fields RG, Gencorelli FJ, Litman RS. Anesthetic management of the pediatric bleeding tonsil. *Paediatr Anaesth*. 2010;20(11):982-986. PubMed Link
3. Yudkowitz FS. “Adenotonsillectomy.” Clinical Cases in Anesthesia. 4th ed. (Reed AP, Yudkowitz FS, eds.). Saunders; 2014: 341-44.
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