Post Tonsillectomy & Adenoidectomy Bleeding

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Overview

- Background
- Pathophysiology
- How to assess patient
- How to manage minor and major bleeding
- Considering nebulized TXA
Background

- > 500k tonsillectomies performed per year in U.S.

- Recommended in the setting of:
  - Recurrent group A streptococcus throat infections
  - Obstructive sleep disorders

Post-Tonsillectomy Hemorrhage

Occurs in 5% of pediatric patients
Post-Tonsillectomy Hemorrhage

Occurs in 5% of pediatric patients

\[ 500k \times 0.05 = 25k \]

Why Do we Care?

- Post-op bleeding is the leading cause of mortality
- Mortality rate: 1 in 500k
Most are now performed as same-day surgeries
TONSILLECTOMY: THE PROCEDURE

Anatomy of the Peritonsillar Space

Arterial supply originates from the:

- External carotid artery
- Tonsillar venous plexus
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Predisposes peritonsillar space to life-threatening hemorrhage
Within a few hours:
- edema

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within 24 hours:
- fibrin clot formation
Within a few hours:
  • edema

within 24 hours:
  • fibrin clot formation

Within a few days:
  • thick cake-like layer
  • grey-white appearance

Post-day 5-7:
  - Fibrin clot separates
  - Leaves thin layer of new stroma
Post-Op Course

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- edema

within 24 hours:
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Highest risk for hemorrhage

Definitions of hemorrhage

- Primary:
  - Within 24 hrs

- Secondary:
  - > 24 hrs
  - Higher incidence
  - Average procedure-to-bleeding time: 6-8 days
Post-Op Course

Day 12-17:

- Thickened layer of epithelium
- Risk of bleeding declines
A Focused Assessment of the Post T&A Patient

Tips and Tricks for Examination

Young patients:

- Headlamp
- Gentle use of tongue depressor
## Tips and Tricks for Examination

### Older patients:
- Let them hold the otoscope
- Macintosh laryngoscope
- Video laryngoscope

## Initial Assessment

A. Active bleeding
B. Airway
C. Hemodynamic Stability
Active bleeding, oozing, or clot?

A. Requires surgical management

B. Transfer to a center with Otolaryngology and operative capabilities
Practice Patterns

- Clot without active bleeding?
  
  50% take patient to OR

  25% admit for observation

- Active bleeding?
  
  82% take patient to OR
Minor Bleeding

Initial Interventions

- Bedside cauterity
  - Silver nitrate
  - Electrocautery

- Younger children are more likely to require OR-management
Be Cautious

- There is always a continued risk of bleeding
- 40% of severe bleeding episodes are preceded by a light bleeding episode

Disposition

Observation in ED with Otolaryngology Consult
- OR -

Admission
Major Bleeding

- Surgical emergency
- While assessing and stabilizing:
  - Notify Otolaryngology and the OR
  - Contact nearest pediatric center with surgical capabilities
Initial Assessment

A. Airway

B. Hemodynamic stability

Airway

- Initial interventions:
  - Place in upright position
  - Lean forward
RSI

- Consider in patients with:
  - Unstable airway
  - Declining mentation
  - Unable to tolerate direct pressure
- Consider stability for transport
- Activate difficult airway protocol

RSI Technique

- Video-laryngoscopy may be difficult
- LMA as temporizing measure
- Continuous suction with large-bore catheter
- Push-dose pressors if hypotensive
- Afterwards, apply direct pressure
Hemodynamic Stability

- Direct pressure over bleeding site
- Immediate IV access
  - If > 2 attempts, then IO
- Resuscitate with isotonic saline vs. PRBCs

Techniques for Direct Pressure

1. Clear any clot or blood in oropharynx with suction or gauze
   a. Allows for visualization
   b. Allows for application of pressure
Techniques for Direct Pressure

2. Apply direct pressure with gauze
   a. Secure with instrument
      • McGill forceps
      • Needle driver

3. Apply counter-pressure
   a. Underneath the mandible
   b. Compresses external carotid artery
4. Soak gauze in topical agents
   a. Epinephrine (1:10k)
   b. Lidocaine with epinephrine
   c. Thrombin
   d. Tranexamic acid

TXA

- PO: Crush 500 mg tablet and dissolve in 10 mL solution
- IV: 500 mg in 5 mL solution
- Nebulized?
Fluid Resuscitation in the Unstable Patient

- Activate massive transfusion protocol
- Give uncrossmatched blood until crossmatched is available

Work-Up and Other Considerations

- Labs
  - CBC
  - PT/PTT
  - Type/screen
- Keep NPO
Risk Factors for Hemorrhage

1. Older age
   - 11-17 years age
   - > 6 years age associated with higher need for interventions
Risk Factors for Hemorrhage

2. Surgical technique

- Not independent risk factors
- Cold technique associated with a lower incidence
3. The Indication for tonsillectomy
   - Chronic recurrent infections associated with higher risk due to scar tissue
4. Coagulopathies

- Both treated and undiagnosed von Willebrand disease most common
NEBULIZED TXA

Nebulized Tranexamic Acid Use for Pediatric Secondary Post-Tonsillectomy Hemorrhage.

Schwarz W¹, Rutan T², Bundick K².

Nebulized TXA: A Case Report

- 3 y/o M with extensive history
- Thrashing, crying, uncooperative
- Gurgling, unable to tolerate bleeding
- Bleeding rate higher than suction rate

Primary Interventions

- Unable to gain IV access
- Unable to apply direct pressure
- Nebulized racemic epi
Secondary Interventions

Nebulized TXA:

- 250 mg IV
- Flow rate: 8L
- Over 2-3 mins

Limitations

1. Correlation vs causation?
Limitations

1. Correlation vs causation?
2. Was it the racemic epi?
3. Synergism?
Discussion

- Studied in cases of pediatric diffuse alveolar hemorrhage
- No systemic or local adverse effects reported
  - No thromboembolic events
  - No seizures

Take Away

- Any oozing or clot formation? Transfer to center with Otolaryngology
- There is always a risk of hemorrhage even with minor bleeding
- Bleeding control best achieved with direct pressure and +/- topical agents
- Consider RSI in patients with declining mentation requiring transfer to another facility
References


Questions?