

Chapter 16

Hematoma Post-Thyroidectomy (Adult)



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Case Outline

Learning Objectives

1. Review differential diagnoses for respiratory distress immediately post-extubation.
2. Review differential diagnoses for respiratory distress in the post-anesthesia care unit (PACU).
3. Review causes of airway compromise post-thyroidectomy.
4. Discuss management of emergent, difficult airway in the PACU.

Simulator Environment

1. Location: PACU of an adult hospital.
2. Manikin setup:
 - (a) Age: adult
 - (b) Lines: 1 x 18 Gauge (G) peripheral intravenous (PIV) catheter
 - (c) Monitors: non-invasive blood pressure (NIBP) cuff, 5-lead electrocardiogram (EKG), pulse oximeter

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3. Medications available: normal saline, propofol, etomidate, succinylcholine, rocuronium, epinephrine, albuterol, fentanyl, midazolam, racemic epinephrine.
4. Equipment available
 - (a) Airway equipment: Mapleson, Ambu bag, face mask, laryngoscope and cuffed and uncuffed endotracheal tubes (ETTs) of various sizes, stylets, oral airway, nasal trumpet, laryngeal mask airway (LMA), suction.
 - (b) Monitors: pulse oximeter, blood pressure cuff, 5-lead EKG.
 - (c) Lines: arterial line kit, central line kit, PIV kits
 - (d) Crash cart with defibrillator

Actors

1. PACU nurse
2. Family member
 - (a) The family member at bedside is anxious and repeatedly asking for updates. They want to know where the surgeon is and question whether the anesthesiologist knows what they are doing.

Scenario development

1. Background
 - (a) You are the board runner covering the PACU, and the PACU nurse pages you STAT to bedside to evaluate a patient in respiratory distress.
 - (b) Upon arrival, you see a 65-year-old woman, obese, who is sitting upright in bed, struggling to breathe on a simple face mask at 10 L/min, oxygen saturation (SpO₂) 88%. She is hypertensive and tachycardic. The gauze taped over her anterior neck is soaked through with bright red blood.
2. Phase 1: evaluation of respiratory distress in PACU
 - (a) The learner should recheck vitals and perform a history and physical exam.
 - (b) On exam, they will observe that the patient is using accessory muscles of respiration and is hyperventilating with shallow tidal volumes.
 - (c) The patient is unable to speak due to severe respiratory distress. They point to their neck gesturing that they are suffocating.
 - (d) From the history from the nurse, the learner will discover that this is a 65 yo woman with obstructive sleep apnea (OSA), hypertension (HTN), type 2

diabetes mellitus (T2DM), obesity with body mass index (BMI) 43, and goiter, who recently underwent an uneventful thyroidectomy. In the operating room (OR), she was an easy mask ventilation and easy intubation. She had some coughing and bucking at emergence, but otherwise tolerated extubation fine.

- (e) She had been in the PACU for about 1 hour. She had some pain at the incision site and was given fentanyl. Then she felt nauseous and started dry heaving. Within about 30 minutes, she had increasing respiratory distress, was less talkative, and started desaturating. The nurse noted that her surgical site dressing appears much more bloody than when she first arrived to PACU.
 - (f) The learner should recognize that the patient has a rapidly expanding hematoma that will likely require drainage and control of hemostasis.
3. Phase 2: management of hematoma
- (a) The learner should try to contact the surgeon, who they will find is unavailable because they have already left the hospital. The surgeon will report that there was minimal bleeding intraoperatively so they are surprised that it is bleeding so much. They will return to the hospital but are currently stuck in evening traffic.
4. Phase 3: intubation and hematoma evacuation
- (a) The patient will eventually fatigue and become apneic. The learner should move to intubate the patient immediately.
 - (b) The learner will find that they have a grade 4 view with direct laryngoscopy.
 - (c) The learner may call for difficult airway equipment including a video laryngoscope. They will be unable to mask ventilate.
 - (d) The learner may place an LMA. The fiberoptic bronchoscope will not be available.
 - (e) The learner may consider cutting the neck to drain the hematoma and alleviate pressure and mass compression. This will result in lots of blood everywhere on the patient's gown and bed.
 - (f) On repeat direct laryngoscopy, the learner will have an improved view and be able to intubate.
5. Phase 4: hemostasis
- (a) With the airway secured and adequate ventilation and oxygenation now resumed, the learner should try to obtain hemostasis. This may include applying and holding pressure manually or trying to apply a pressure bandage, until the surgeon arrives.
 - (b) Depending on hemodynamics, labs, and the state of the bleeding, the learner may initiate massive transfusion protocol or at least order crossmatched blood.

Scoring Rubric

Table 16.1 Scoring rubric for case scenario on Hematoma Post-Thyroidectomy

Topic: Hematoma Post-Thyroidectomy			
Participant Name:			
Evaluator Name:			
Score:			
		Completed	Not Completed
Respiratory distress			
Evaluation	Rechecks vital signs		
	Obtains history (intraoperative complications, recent medication administration)		
	Auscultates bilateral breath sounds		
	Observes patient’s work of breathing (accessory muscles, depth of tidal volumes, tracheal tugging, speech)		
	Examines surgical site. May remove dressing		
	Asks about post-surgical bleeding		
	Identifies expanding neck hematoma		
Management	Calls for emergency airway equipment (anesthesia cart, code bag, crash cart)		
	Calls for ear/nose/throat (ENT) surgeon to come to bedside STAT		
	Provides supplemental oxygen: Simple face mask, mask and Mapleson or Ambu-bag		
	Identifies patient is becoming fatigued		
	Decides to reintubate patient		
	Calls for equipment to release surgical sutures and hematoma		
	Calls for suction		
	Reintubates patient in a timely fashion.		
Requests OR be prepared for emergent takeback for hemostasis			
Difficult intubation			
	Calls for difficult airway equipment (video laryngoscope, laryngeal mask airway, Bougie, Fiberoptic bronchoscope)		
	Recognizes inability to mask ventilate and inability to intubate		
	Follows difficult airway algorithm		
	Places laryngeal mask airway		
	Releases surgical sutures prior to intubation		
	Releases surgical sutures after failed intubation/mask ventilation		
	Performs repeat intubation attempt and is successful		
Hemostasis			
	Applies pressure manually or with pressure dressing		
	Checks venous blood gas (VBG) or arterial blood gas (ABG) to evaluate hemoglobin (Hb)/hematocrit (Hct)		
	Orders packed red blood cells (PRBCs) and fresh frozen plasma (FFP) to be crossmatched		
	May initiate massive transfusion protocol		

Summary of Clinical Teaching Points

What are common post-extubation complications in pediatric patients?

Table 16.2 Common causes of pediatric post-extubation complications

Event	Cause	Prevention and Treatment
Upper airway obstruction	Excessive narcotics Obstructive sleep apnea	Larger adolescent: Reposition to head of bed elevated Smaller: Reposition to lateral decubitus position with head extension
Laryngospasm	Deep extubation / laryngeal mask airway (LMA) removal Secretions Stage 2 emergence/extubation	Ensure adequate ventilation prior to leaving the operating room Minimize secretions by thoroughly suctioning Minimize head/neck manipulation post-extubation
Stridor	Airway edema Traumatic intubation Nerve injury	Early recognition Intravenous dexamethasone Racemic epinephrine Head of bed elevation
Bronchospasm	Recent upper respiratory infection Known asthma	Albuterol nebulizer Intravenous epinephrine

What are common causes of airway compromise post-thyroidectomy? [1–3]

Table 16.3 Common causes of airway compromise post-thyroidectomy based on time since surgery

Time Since Extubation	Type of Problem	Etiology	Special Considerations
Minutes-hours	Hematoma	Inadequate surgical hemostasis Coughing/bucking especially at emergence	Ecchymosis Bleeding at suture site/dressing Visually expanding neck
	Recurrent laryngeal nerve injury	Ischemia, contusion, traction, entrapment, transection	Unilateral vocal cord paralysis: Glottic incompetence, hoarseness, breathlessness, ineffective cough, aspiration Bilateral vocal cord paralysis: Stridor at extubation, requires reintubation
	Tracheomalacia	Prolonged compression of trachea by mass (e.g. goiter)	
	Laryngeal edema	Trauma Venous obstruction from large hematoma Generalized myxedema of hypothyroidism Thyroid lymphoma	
Hours-days	Hypocalcemia	Permanent: Inadvertent excision of parathyroids Transient: Reversible ischemia or edema	
	Wound infection		

What are risk factors for hematoma post-thyroidectomy? [1–3]

- Male gender
- Inflammatory thyroid conditions
- Partial thyroidectomy
- Kidney disease
- Bleeding disorders
- Previous thyroid surgery
- Less common in recent years with improved surgical instruments – thyroidectomy is typically an outpatient surgery

What are signs and symptoms of a hematoma post-thyroidectomy? [1–3]

- Prominent, dark ecchymosis
 - Present in 75% of cases of superficial bleeding
 - Present in 33% of cases of deep bleeding

- Respiratory distress
 - Present in a third of patients with deep hematoma
 - Less common with superficial hematoma

What do you do if you can't intubate and can't ventilate in a patient with a post-thyroidectomy hematoma? [1–3]

- Mass effect from the neck hematoma:
 - Distorted airway anatomy
 - Direct compression of the (expanding) hematoma on the larynx and pharynx
 - The later intubation is done, the more challenging it will be because of evolving hematoma expansion and compression.
- Laryngo-pharyngeal edema secondary to impeded venous and lymphatic drainage
- Prefer early re-intubation
 - Rare to require reopening of surgical wound to facilitate intubation
 - May need a smaller diameter endotracheal tube secondary to laryngeal edema

How do you release a neck hematoma post-thyroidectomy? [1–3]

- “Release the sutures.”
 - Not always that simple
 - Need to release ALL the layers, not just the superficial sutures
 - Variables: superficial versus deep hematomas, bleeding location
 - Traditionally, clip removers are kept at bedside to be used to cut sutures and provide rapid release of hematoma
- Evacuation of hematoma
 - Irrigation
 - Manual removal by hand
 - Repeat surgery (e.g. take back to operating room) for hemorrhage is rare

References

1. Fan C, et al. Risk factors for neck hematoma requiring surgical re-intervention after thyroidectomy: a systematic review and meta-analysis. *BMC Surg.* 2019;19(98):1–12.
2. Bacuzzi A, et al. Anaesthesia for thyroid surgery: perioperative management. *Int J Surg.* 2009;6:S82–5.
3. Lu I, et al. Preoperative, intraoperative and postoperative anesthetic prospective for thyroid surgery: what's new. *Gland Surg.* 2017;6(5):469–75.