Tonsillectomy and Adenoidectomy

Redirecting to: https://medicine.uiowa.edu/iowaprotocols/tonsillectomy-and-adenoidectomy

return to: Pediatrics

see also: Peritonsillar Abscess Management; Tonsils and Adenoids, Maximum allowable blood loss

1. GENERAL CONSIDERATIONS: Although the incidence of the tonsillectomy and adenoidectomy has decreased in recent years, it is still the most common major surgery performed in children. The procedure peaked in the 1970's with approximately one million cases performed per year. In general, we have also witnessed a shift in the indication for the procedure with a movement from an infective process to that of airway obstruction.

   a. Indications
      i. Obstruction: Upper airway obstruction, Obstructive sleep apnea, poor feeding and failure to thrive, hypernasal speech secondary to enlarged tonsils.
      ii. Infective: Recurrent tonsillitis, cryptic tonsillitis, chronic tonsillitis, peri tonsillar abscess, or halitosis
      iii. Misc: Asymmetric enlargement with suspicion of neoplasm; Abnormal facial growth; recurrent hemorrhagic tonsillitis; velopharyngeal insufficiency secondary to enlarged tonsils

   b. Contraindications for tonsillectomy include the following:
      i. Bleeding diathesis
      ii. Poor anesthetic risk or uncontrolled medical illness
      iii. Anemia
      iv. Acute infection (relative) "hot tonsillectomy" or 'tonsillectomy a chaud' is reasonable treatment for peritonsillar abscess (2008 Berry et al) and (2012 Akin et al)

   c. Discuss potential complications with patient/family
      i. Bleeding, infection, reaction to the anesthesia
      ii. Damage to adjacent structures (lips, teeth, tongue)
         1. Assess for risk of VPI (velopharyngeal insufficiency) and relate the potential for nasal regurgitation of food/fluid and hypernasal speech (anatomic abnormalities such as submucous cleft is a relative contraindication)
         2. Discuss altered taste, tongue numbness
      iii. Relate: may feel like 'the worst sore throat of your life' until it heals

2. Anatomy:
   a. Palatine tonsils:
      i. The palatine tonsils are found in the tonsillar fossa, limited by the palatoglossal arch anteriorly and the palatopharyngeal arch posteriorly. The superior pharyngeal constrictor muscle lies laterally. The tonsils are surrounded by a fibrous capsule

   b. Blood supply:
      i. Blood supply is from the tonsillar and ascending palatine branches of the facial artery, the ascending pharyngeal artery, the dorsal lingual branch of the lingual artery and the palatine branch of the maxillary artery.
         1. Tonsillar branch of facial artery
         2. Ascending palatine branch of facial artery
         3. Ascending pharyngeal artery
         4. Tonsillar branch of dorsal lingual artery
         5. Lesser palatine artery from maxillary artery
      ii. OF NOTE:
         1. The internal carotid artery lies approximately 2.0-2.5 cm posterolaterally to the tonsil.
         2. The tonsillar veins pierce the superior pharyngeal constrictor muscle to drain into the external palatine, pharyngeal and facial veins.
         3. Innervation is from the sphenopalatine ganglion via the lesser palatine and glossopharyngeal nerves.
         4. Efferent lymphatics drain into the upper deep cervical lymph nodes.

   c. Adenoids:
      i. The adenoid or pharyngeal tonsil is a single mass of pyramidal tissue
with its base on the posterior nasopharyngeal wall and its apex pointed toward the nasal septum. The surface is invaginated in a series of folds with some crypts but without the complex crypts found in the palatine tonsils. The epithelium is pseudostratified ciliated epithelium and is infiltrated by the lymphoid follicles.

**Blood supply:**
1. Ascending palatine branch of the facial artery
2. Ascending pharyngeal artery
3. Pharyngeal branch of the internal maxillary artery
4. Artery of the pterygoid canal
5. Ascending cervical branch of the thyrocervical trunk

**Venous drainage** is through the pharyngeal plexus and the pterygoid plexus flowing ultimately into the facial and internal jugular veins.

**Innervation** is derived from the glossohypepharyngeal and vagus nerves.

**Efferent lymphatics** drain to the retropharyngeal nodes and the upper deep cervical nodes.

1. **PREOPERATIVE PREPARATIONS**
   a. A full patient evaluation should be performed prior to surgery. History including bleeding disorders, prior issues with anesthesia for both the patient and family, and degree of obstructive symptoms should be elicited. Recent URI's should also be identified, as this places the child at an increased risk for laryngospasm.
a. Tube Placement: The ET tube should be placed at exactly midline and brought inferiorly
   i. The patient will be rotated 90-degrees and the inferior placement of the ET tube allows for extension of tubing inferiorly and laterally towards anesthesia and out of the operative field.
   ii. The Crowe-Davis will be placed and the tube sits in the groove of the tongue blade.

b. The bed is rotated 90 degrees and positioned appropriately.
   i. A shoulder roll may be used to improve neck extension and optimize the view of operative field
      1. Down Syndrome: Due to risk of atlanto-axial instability in these patients, extreme caution should be used in head positioning, including no shoulder roll and minimal head tilting.
         a. Preoperative x-rays or recent scans should be obtained or evaluated prior to the operation date.
         i. Laxity of over 4 mm suggests axial-atlanto instability
         ii. Due to a low level sensitivity in flexion/extension films in detecting AAI, it is suggested to take neck precautions in all Down Syndrome patients.
   c. Carefully place the Crowe-Davis retractor.
      i. Ensure that the tongue blade is the appropriate size.
         1. This should extend far enough to allow for retraction of the base of tongue
         2. This should not be too long as to damage the posterior pharyngeal wall.
      ii. The tube is placed exactly at midline.
      iii. The tongue may be manipulated into the correct position with the Hurd retractor.
   d. Prior to performing this procedure, the palate should be palpated, with close inspection of the palate and uvula.
      i. Care should be taken if a bifid uvula is present indicating signs of a submucous cleft.

There are multiple ways to perform a tonsillectomy. Please see the preferred protocol for individual staff members below.

1. POSTOPERATIVE CARE
   a. Children under 3 years of age should be monitored overnight in the hospital for POPE II.
   b. Adequate pain control is imperative in the post-operative course.
      i. We no longer routinely use Lortab in children d/t risk of metabolic differences resulting in potential for respiratory depression and death
      ii. Non-Opiate Pain Protocol for Post-Tonsillectomy/Adenoidectomy Patients
         1. Tylenol (15mg/kg) scheduled every 6 hours, alternating with Motrin every 6 hours
            a. Motrin dosing for pain (from Micromedex): 6 months to 12 years old, 5 to 10 mg/kg PO every 6 to 8 hours as needed, MAX 4 doses/day; 12 years and older, 200 to 400 mg ORALLY every 4 to 6 hours as needed, MAX 1200 mg/day
b. This way, the patient will get a non-opiate pain medication every 3 hours (Tylenol then Motrin then Tylenol...)

c. **Non-narcotic analgesia in pediatric patients**

d. **Post operative tonsil bleed management**

i. Abbreviated H&P - assess the airway and get an idea of how much blood loss has occurred. Also see if you can identify which tonsil fossa is bleeding.

ii. Preferred management is to take to patient to the operating room for cauterization, however there are some steps you can take in the interim to help control the blood loss. If supplies are available the protocol up to the application of hemostatic matrix can be executed in less than 2 minutes, most of which is spent applying pressure to the side of bleeding.

iii. Apply a generous amount of oxymetazoline in the nasal passage ipsilateral to the tonsil bleed. This will allow the vasoconstrictor to trickle down the nasopharynx and into the tonsil bed.

iv. Spray topical lidocaine along the soft palate, posterior tongue and tonsil fossa to decrease gag reflex.

v. Apply a tonsil ball soaked in either oxymetazoline or epinephrine 1:1000 (vasoconstriction occurs rapidly so systemic uptake is minimal). Hold pressure or have the patient hold pressure until the bleeding decreases.

vi. Examine the tonsil fossa to determine the site of bleeding. Small vessels can be cauterized with silver nitrate. Alternatively a thrombin-gelatin hemostatic matrix (Floseal or SurgiFlo) can be applied to the tonsil bed followed by a saline-soaked tonsil ball.

vii. Continue holding pressure over the tonsillar fossa for 5 minutes.

viii. Have the patient rinse their mouth out with ice-cold water.

ix. Evaluate for residual bleeding. Ideally, complete hemostasis will have been obtained. However, even if hemostasis is incomplete, it should at least decrease the rate of blood loss as the patient is transferred to the operating room.

---

**2. DICTATION TEMPLATES:**

a. Dr. Richard Smith preferred method:

i. Informed consent was reviewed with the parents. The patient was transferred to the room and a time out was performed. A Crowe-Davis mouth gag was placed with good exposure of the oropharynx. First the adenoid bed was addressed. The palate was palpated and uvula inspected with no abnormalities noted. Sizing the adenoid curette on the maxillary incisors, the curette was placed at the base of the nasopharynx and the adenoids were removed. A tonsil ball was used to pack the adenoid bed. The right tonsil was then addressed. Curved Allis clamps were placed on the superior pole, and the tonsil was medialized. A Cushing toothed forceps was used to perform blunt dissection of the superior pole of the tonsil, being careful not to enter the tonsil, but to dissect out the fibrous capsule. Once a significant portion of the tonsil was free, with only a portion of the inferior pole remaining, a Tyding tonsil snare was placed around the remaining tonsil tissue, and the tonsil was subsequently removed. Two tonsil balls were placed in the right tonsillar fossa. The left tonsil was then addressed, and removed in a similar fashion as the right, with subsequent hemostasis achieved using suction cauterity. The tonsil balls were then removed from the tonsillar and adenoidal beds with similar hemostasis achieved using suction cautery. 6.0 cc of Marcaine was injected along the bilateral palatoglossal and palatopharyngeal arches. The nasal and oral cavities were thoroughly irrigated with no active bleeding noted. The Crowe-Davis retractor was removed at this time. Irrigation was performed and the patient’s stomach was suctioned for contents. The mouth was cleaned of debris and wiped clean, and bacitracin ointment was placed on the lips. The patient was then turned over to Anesthesia in good condition.

b. Dr. Jose Manaligod preferred method:

i. Informed consent was reviewed with the parents and the patient was brought to the room and placed in the supine position. A Crowe-Davis retractor was placed with good visualization of the oropharynx. A red rubber catheter was then placed to retract the soft palate and allow good visualization. The soft palate was palpated, and uvula inspected with no abnormalities. An Adenoid curette was sized using the maxillary incisors and used to remove the adenoid bed. A tonsil ball was placed to help achieve hemostasis. The right
tonsil was then addressed. Curved Allis clamps were used to grasp the superior pole of the tonsil and medialize it. The mucosa from the superior pole enveloping the fibrous capsule was divided using a sickle knife. Good scissors were used to dissect the tonsil from the tonsillar bed, maintaining the fibrous capsule. With only the inferior pole remaining, a Tydings tonsil snare was placed and the remaining tonsil was removed. A tonsil ball was placed into the tonsillar fossa for hemostasis. The left tonsil was then addressed. Curved Allis clamps were used to grasp the superior pole of the tonsil and medialize it. The mucosa from the superior pole enveloping the fibrous capsule was divided using a sickle knife. Good scissors were used to dissect the tonsil from the tonsillar bed, maintaining the fibrous capsule. With only the inferior pole remaining, a Tydings tonsil snare was placed and the remaining tonsil was removed. A tonsil ball was placed into the tonsillar fossa for hemostasis. The tonsil balls were removed, and suction cautery was used to achieve hemostasis in the tonsillar and adenoid beds. The nasopharynx was irrigated and suctioned, and the red rubber catheter was removed. Marcaine was injected into the tonsillar arches, and the Crowe-Davis was removed. The patients mouth was wiped clean, and ointment was placed prior to returning the patient to Anesthesia in good condition.

c. Dr. Hoffman preferred method:
   i. Informed consent was reviewed with the patient and family immediately preoperatively after which the patient was brought to the room and placed in the supine position. A Crowe-Davis retractor was placed with good visualization of the oropharynx. The soft palate was palpated, and uvula inspected with no abnormalities. With a curved tonsil injection needle 1% lidocaine with 1:100,000 epinephrine was injected into the tonsillar pillars and deep to the tonsil. A waiting period (to permit maximal vasoconstrictive effect) was followed by addressing the right tonsil by grasping it with a curved allis clamp. The mucosa from the superior pole enveloping the fibrous capsule was divided using a sickle knife. A tonsillar hemostat (or Kelley) was used to develop a plane between the tonsil and fascia overlying the constrictor muscle. Individual blood vessels are identified and addressed using the guarded bipolar cautery. The tonsil scissors are used to incise mucosa and with a pushing action, (using scissors, Fischer knife, hemostat or bipolar cautery) the tonsil was delivered inferiorly to the lower pole. Bipolar cautery at the lower pole then permitted final separation of the tonsil from the fossa with scissors in a bloodless fashion. The tonsillar bed was carefully inspected with additional hemostasis accomplished with bipolar cautery supplemented (rarely) with 3-0 chromic suture placed with needle driver. Tannic acid is then placed in the fossa. An identical procedure is performed on the contralateral side and the procedure terminated. Marcaine may be injected into the tonsillar arches.

d. Monopolar Cautery
   i. Informed consent was obtained and the patient was transferred to the ASC and placed in the supine position. A Crowe-Davis retractor was placed with good visualization of the oropharynx. A curved Allis was used to grasp the superior pole of the right tonsil. Monopolar cautery was used to release the thin layer of mucosa from the fibrous layer of the tonsil. The tonsil was dissected out of the tonsillar bed with monopolar cautery while maintaining the fibrous layer of the tonsil. Two tonsil balls were placed for hemostasis of the tonsillar bed. The left tonsil was then addressed. A curved Allis was used to grasp the superior pole of this tonsil as well. Monopolar cautery was used to release the thin layer of mucosa from the fibrous layer of the tonsil. The tonsil was dissected out of the tonsillar bed with monopolar cautery along the fibrous capsule as well. Two tonsil balls were placed in this side as well. The tonsil balls were subsequently removed from both sides at that point, and suction cautery was used to achieve hemostasis of the tonsillar beds. The nasopharynx and oropharynx were copiously irrigated and suctioned. Marcaine was injected at 6 cc along the tonsillar pillars. The stomach was suctioned, and the patient was returned to anesthesia in good condition.

e. Coblation
   i. Informed consent was reviewed, and the patient was brought to the OR and placed in the supine position. The patient underwent general oral endotracheal intubation. The table was rotated, patient
positioned, eyes taped, and head was draped. A Crowe-Davis retractor was placed with good visualization of the oropharynx. A red rubber catheter was then placed to retract the soft palate and allow good visualization. The soft palate was palpated, and uvula inspected with no abnormalities. The tonsils were resected in the capsular plane using blunt dissection and coblation. The coblator tip cautery was used as needed. The nasopharynx and hypopharynx were irrigated and suctioned. Hemostasis was confirmed. The red rubber catheter and Crowe-Davis retractor were removed. There was no injury to the lips gums, teeth or tongue. The patient was awakened, extubated, and taken to recovery.

f. Fischer Knife (Dr. Kacmarynski method)
   i. Informed consent was reviewed with the parents and the patient was brought to the room and placed in the supine position. A Crowe-Davis retractor was placed with good visualization of the oropharynx. A red rubber catheter was then placed to retract the soft palate and allow good visualization. The soft palate was palpated, and uvula inspected with no abnormalities of signs of submucous cleft. An adenoid curette was sized using the maxillary incisors and used to remove the adenoid bed. A tonsil ball was placed to help achieve hemostasis. The right tonsil was then addressed. Curved Allis clamps were used to grasp the superior pole of the tonsil and medialize it. The mucosa from the superior pole enveloping the fibrous capsule was divided using a 14-blade scalpel. A Fischer knife was used to dissect the tonsil from the tonsillar bed, maintaining the fibrous capsule. With only the inferior pole remaining, a Tydings tonsil snare was placed and the remaining tonsil was removed. A tonsil ball was placed into the tonsillar fossa for hemostasis. The left tonsil was then addressed. Curved Allis clamps were used to grasp the superior pole of the tonsil and medialize it. The mucosa from the superior pole enveloping the fibrous capsule was divided using a 14-blade scalpel. A Fischer knife was used to dissect the tonsil from the tonsillar bed, maintaining the fibrous capsule. With only the inferior pole remaining, a Tydings tonsil snare was placed and the remaining tonsil was removed. A tonsil ball was placed into the tonsillar fossa for hemostasis. The tonsil balls were removed, and suction cautery was used to achieve hemostasis in the tonsillar and adenoid beds. The nasopharynx was irrigated and suctioned, and the red rubber catheter was removed. Marcaine was injected into the tonsillar arches, and the Crowe-Davis was removed. The patients mouth was wiped clean, and ointment was placed prior to returning the patient to Anesthesia in good condition.

g. Dr. Kacmarynski prefers not to use towel over eyes. Does not use marcaine. Uses red rubber catheter but take care not to place traction on ala, place gauze between ala and clamp

3. SUGGESTED READING