Hemostasis in Tonsillectomy

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KEYWORDS

• Tonsillectomy • Hemorrhage • Transfusion • Complication • Hemostasis
• Tonsillotomy

KEY LEARNING POINTS

At the end of this article, the reader will:

- Appreciate the incidence of bleeding complications associated with tonsillectomy.
- Be able to review the relevant surgical vascular anatomy.
- Gain familiarity with methods of obtaining hemostasis during tonsillectomy and managing posttonsillectomy hemorrhage.

WHAT IS THE INCIDENCE OF POSTTONSILLECTOMY HEMORRHAGE?

Incidence of posttonsillectomy hemorrhage

- Overall hemorrhage rate of 3% to 5% is generally accepted[1]
- Primary posttonsillectomy hemorrhage: ~2%
- Secondary posttonsillectomy hemorrhage: most commonly between 5 and 10 days after surgery: ~3.7%
- Reported rates of posttonsillectomy mortality resulting from hemorrhage reported 1 per 7000 to 1 per 170,000[2,3]

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Tonsillectomy and/or adenoidectomy is performed over several hundred thousand times per year in adults and children in the United States.[4] There are significant variations in the reported incidence of posttonsillectomy hemorrhage (PTH) among studies, which may be caused by various definitions of hemorrhage, technique of tonsillectomy, postoperative care, and the study populations. Hemorrhage after tonsillectomy is not a rare event, but mortality caused by hemorrhage is rare. Primary PTH occurs within 24 hours of surgery and is considered to usually result from blood vessels not effectively controlled during surgery. Secondary PTH occurs after 24 hours of surgery and is thought to occur from exposed blood vessels after sloughing of the eschar.

What is the source of hemorrhage following tonsillectomy?

- Blood supply to the palatine tonsils arises from the
  - Tonsillar branch of the facial artery
  - Dorsal lingual artery
  - Ascending pharyngeal artery
  - Lesser palatine artery
  - Ascending palatine artery

The lateral surface of the palatine tonsils is covered by a condensation of pharyngobasilar fascia, which has septae extending into the tonsils that transmits arteries, veins, and nerves. On removal of the tonsils, transected blood vessels may spasm and reduce blood loss or stop bleeding altogether.

Primary PTH may result from a blood vessel that initially spasms and later resumes bleeding if a method is not used to promote coagulation. Some surgeons elect to treat only sites observed to bleed during the tonsillectomy to reduce surrounding tissue damage. Other surgeons elect to treat all potential bleeding sites with the goal of potentially reducing the risk of PTH,[5] although this may slow tissue healing and increase postoperative pain and need for analgesics.

Vascular anomalies and anatomic variations may cause some concern for potential injury or increased risk of PTH. In particular, the course of the cervical internal carotid artery has a high reported rate of variable anatomy, particularly in association with velocardiofacial syndrome.[6] However, there are no data to support an increased risk of PTH because of variable vascular anatomy.

What factors have been proposed to affect hemorrhage during tonsillectomy?

- Surgical technique
  - Cold dissection (sharp, blunt, snares) and hemostasis with ties or diathermy
  - "Hot" dissection
    - Diathermy or electrocautery
      - Direct contact with tissue (monopolar, bipolar)
      - Indirect (argon)
    - Laser
  - Bipolar radiofrequency ablation (coblation)
  - Harmonic scalpel
  - Argon
  - Intracapsular tonsillectomy/tonsillotomy
- Patient factors
  - Age
  - Indication for tonsillectomy
  - Coagulopathy
  - Vascular anatomy, aberrant blood vessels