Postoperative Tonsillectomy Hemorrhage

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KEYWORDS

• Tonsillectomy • Hemorrhage • Bleeding • Pediatric • Emergency medicine

KEY POINTS

- Tonsillectomy is a common surgery in pediatric patients for sleep-disordered breathing and recurrent throat infections.
- Postoperative bleeding is the leading cause of death in tonsillectomy patients.
- Any patient with bleeding, oozing, or clot formation requires observation, admission, or surgical intervention.
- Rapid, focused assessment is necessary to identify life-threatening hemorrhage.
- Management of severe bleeding includes direct pressure, intubation, blood volume replacement, and surgical intervention.

INTRODUCTION

Tonsillectomy is one of the most common surgeries performed in the field of otolaryngology, with greater than 500,000 performed in the pediatric population in the United States every year.[1] Most of these surgeries are now performed as same-day surgeries,[2] resulting in a shift in the management of postoperative complications from the inpatient setting to primary care clinics and emergency departments. Thus, every emergency physician should be familiar with the procedure, postoperative course and management of the life-threatening complications associated with tonsillectomy. Mortality associated with tonsillectomy is primarily related to anesthesia complications and postoperative hemorrhage.[3]

The two most common and accepted indications for tonsillectomy, with or without adenoidectomy, are recurrent throat infections and obstructive sleep disorders.[1] The American Academy of Otolaryngology-Head and Neck Surgery recommends

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tonsillectomy in the setting of recurrent throat infections (characterized by temperature >38.3°C, cervical adenopathy, tonsillar exudate, or positive throat culture for group A β-hemolytic streptococci) to improve quality of life, reduce antibiotic usage, reduce health care provider visits, and reduce missed school days. Additionally, it recommends considering tonsillectomy in patients with sleep-disordered breathing to improve sleep patterns and vocal quality; however, the evidence is less compelling.[1] There are several controversial indications for tonsillectomy including peritonsillar cellulitis or abscess, pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS),[4] cryptic tonsillitis, immunoglobulin A (IgA) nephropathy, hemorrhagic tonsillitis, or a chronic carrier state of group A β-hemolytic streptococci.[1,5,6]

TONSILLECTOMY: THE PROCEDURE

Familiarity with the anatomy of the peritonsillar space is necessary to understand the risk of postoperative hemorrhage. There are multiple arterial supplies to the palatine tonsils, originating from the external carotid artery and the tonsillar venous plexus, which are ligated or cauterized during surgery. It is this substantial vascular supply that predisposes the peritonsillar space to life-threatening arterial hemorrhage postoperatively.

A tonsillectomy involves the *en bloc* removal of the tonsil and its capsule from the peritonsillar space by dissecting it away from the muscular wall. Multiple techniques for tonsillectomy are in practice, including cold or traditional techniques, which utilize sharp instruments to incise and blunt instruments to dissect away the tonsil. Hemostasis is achieved by direct pressure, suture ligation, or chemical cautery. Hot techniques involve a variety of electrosurgical or thermal instruments to excise the tonsil and achieve hemostasis.[5,7] Debate continues within the literature regarding the ideal technique with regards to postoperative pain and complications, risk of regrowth, and efficacy with regards to indication. Cold techniques, however, are associated with a lower rate of postoperative bleeding when compared with hot techniques.[8–10]

Tonsillotomy, also known as an intracapsular tonsillectomy or partial tonsillectomy, is a newer technique that removes the majority of the tonsil while leaving a base of lymphoid tissue and the capsule.[11] Multiple studies have demonstrated varying degrees of benefit to this procedure including decreased pain and lower rates of postoperative bleeding. Tonsillotomy, however, is associated with higher rates of tonsillar regrowth and symptom recurrence, and thus is less widely utilized.[11–14]

POSTOPERATIVE RECOVERY

A tonsillectomy is a traumatic procedure with associated risks; thus understanding the normal postoperative course is useful in the identification of complications. Within several hours of the surgery, edema may develop on the uvula, tonsillar pillars, and tongue, resulting in discomfort and a globus sensation, yet this rarely results in clinically significant upper airway obstruction requiring admission for monitoring.[15]

The characteristic fibrin clot forms within the first 24 hours of surgery, coating the tonsillar fossa, and propagates into a thick cake over the next several days with a characteristic grey-white appearance.[16] Depending on technique, the fibrin clot typically separates from the tonsillar fossa between postoperative day 5 and 7, leaving a thin layer of new stroma and lining of epithelium in the peripheral fossa. This is the point when the vascular bed is relatively exposed and at highest risk for significant hemorrhage. By day 12 to 17, the tonsillar fossa is covered by a thickened layer of epithelium, and the risk of bleeding declines (**Fig. 1**).