Complications of Tonsillectomy and Adenoidectomy in Pediatric Patients Less than 3 years of Age

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ABSTRACT

The current standard of care is to admit all children under the age of three undergoing tonsillectomy and adenoidectomy (T&A). As healthcare reform increasingly asks for evidence-based analysis to justify medical decisions and expenditures there is increased interest in revisiting this accepted standard. Our study was undertaken to determine the current incidence of post-operative complications associated with tonsillectomy and adenoidectomy in very young children. A retrospective chart review of 105 T&A cases in patients < 3 years of age was analyzed and demonstrated no major hemorrhage complications and 4 minor post-operative dehydrations complications that required readmission for intravenous fluids.

BACKGROUND / SIGNIFICANCE

- Tonsillectomy is one of the most frequently performed surgical procedure by pediatric otolaryngologists
- Primary or Secondary Hemorrhage is the major complication for adenotonsillectomy patients
- "Minor" complications such dehydration and refractory emesis are of particular concern in the very young, in part due to this population's limited hemodynamic reserve
- Early studies indicated young patients were at greater risk for postoperative complications requiring readmission and inpatient care services
- Multiple groups have proposed airway obstruction as a high risk factor for post-operative complications in the very young ; in recent years, obstructive breathing represents the most common indication for tonsillectomy
- The 1996 guidelines set by the Pediatric Otolaryngology Committee of the American Academy of Otolaryngology – Head and Neck Surgery recommend children under 3 years of age be treated in the inpatient service although objective data was not sited to determine why this specific age was chosen as the cutoff
- Surgical technique changes over the last 14 years including widespread transition from "cold / classic" tonsillectomies to electrocautery for hemostasis and powered intracapsular microdebrider aided procedures
- Overnight admission of post-op patients have been estimated to cost between $500 – $1000 depending upon the level of care required.

METHODS

Surgical Procedure All procedures were supervised by a single pediatric otolaryngologist (J.E.J.). Patients allowed clear liquids up to 2 hours prior to their surgical procedure. Tonsillectomy was performed using electrocautery dissection or powered intracapsular microdebrider-aided techniques, respectively (Figure 1). Adenoidectomy was performed using a combination of adenoid curette excision and ST. Clair-Thompson forceps. Patients also routinely received a single intra-operative dose of weight appropriate antibiotic, acetaminophen suppository, decadron [dexamethasone] (0.5mg/kg), and dolasetron (0.35 mg/kg with a maximal dose of 12.5mg).

Chart Review Institutional Review Board (IRB) approval from Weill Cornell Medical College (protocol no. 0908010570) was granted prior to the study's onset. A retrospective chart review was performed analyzing 105 T&A cases involving patients younger than 3 years of age. All surgical procedures were performed between Jan 2003 – Oct 2009 at New York-Presbyterian Hospital, a tertiary care medical center in New York City. Medical records were reviewed for patient age, sex, indications for surgery, perioperative interventions, and complications. Of the 105 cases, 20 patients were excluded due to inadequate postoperative follow-up records or the presence of severe underlying medical conditions unrelated to their need for T&A.

Figure 1. Types of surgical procedures

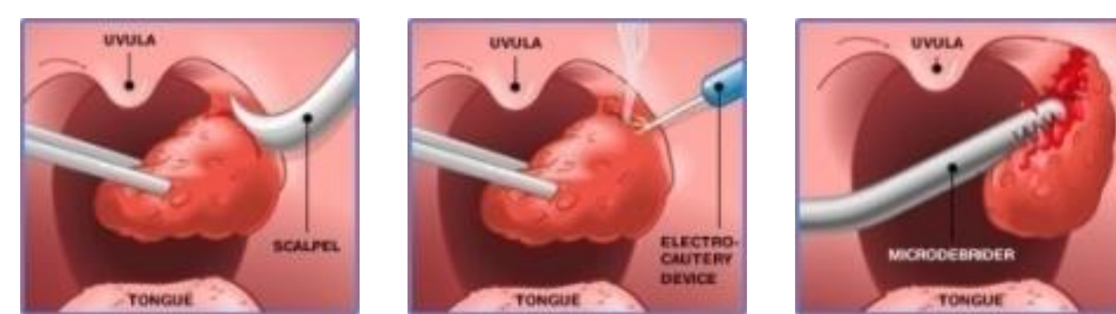


Figure 2. Indications for T&A Surgery

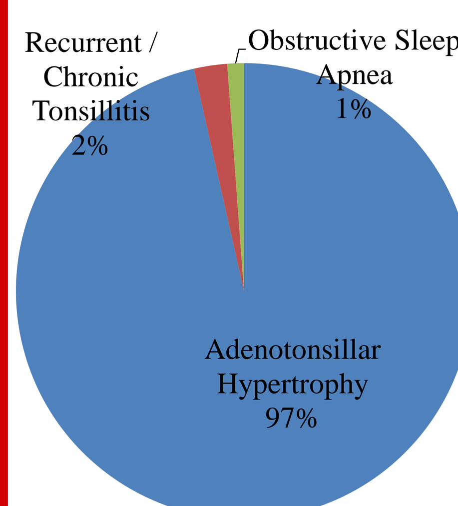
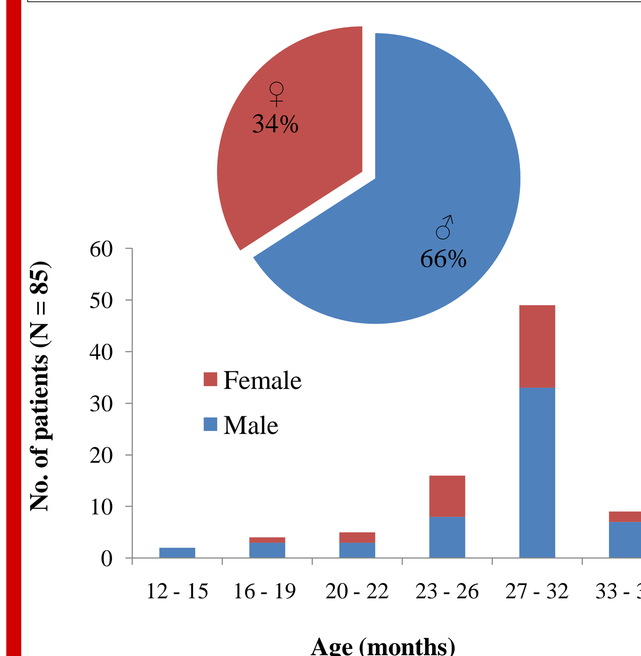


Figure 3. Patient gender and age distributions



RESULTS

Patient Population The demographics of the 85 patients included in the final analysis are represented in Figures 2-3. The average age for the cohort was approximately 27.5 months old and ranges from 13 – 35 months. 83patients (98.9%) underwent surgery for an obstructive airway-related disease with admitting diagnoses of either adenotonsillar hypertrophy or Obstructive Sleep Apnea. 2 patients (2.4%) underwent T&A for chronic / recurrent tonsillitis (Figure 2). The male to female ratio of the series was 66 – 34%, respectively (Figure 3).

Surgical Outcomes Among reviewed cases, 79 (92.9%) were performed without subsequent complication (Table 1). Dehydration was the most common complication requiring readmission of (4.7%) of the patients ranging in age from 14 – 30 months. Readmission occurred between postoperative days (POD) 2 -6. The gender ratio for incidence of dehydration was 1 : 1 among readmitted patients . 2 patients suffered other complications --reactive airway disease (1) and postoperative fever (1) , respectively, which were both identified and treated in the post anesthesia care unit (PACU) resulting in same day discharge (Table 3).

Hospital Evaluation before Discharge Patients spent on average ~152 min in the PACU, excluding the 11 (28%) who were scheduled for 24hr inpatient observation post-op. Patient stay in the PACU ranged from 60 – 360 min (Table 2).

Table 1. Rate of complications by patient age

Age (months)	Total no. of patients	Complications, n (%)
12 - 15	2	0 (0)
16 - 19	4	1 (25)
20 - 22	5	0 (0)
23 - 26	17	1 (5.9)
27 - 32	48	2 (4.2)
33 - 36	9	0 (0)

Table 2. Duration of postoperative hospital stay

Age (months)	Avg time in PACU* (min)	24hrs planned, n (%)
12 - 15	---	2 (100)
16 - 19	215	2 (50)
20 - 22	210	2 (40)
23 - 26	181	1 (5.9)
27 - 32	137	4 (8.3)
33 - 36	133	0 (0)

(*Excludes the 11 patients pre-"planned" for 24hr inpatient service)

Table 3. Individual patient demographics for each documented complication

Complication	Patient	Sex	Age (mos)	PACU stay before discharge	PostOp Day (POD) readmitted
Dehydration	1	♀	24	120min	POD2
Dehydration	2	♂	18	24hrs	POD6
Dehydration	3	♀	30	120min	POD1
Dehydration	4	♂	30	105min	POD2
Airway Disease	5	♀	30	120min	POD0*
Fever	6	♂	24	180min	POD0*

(**POD0* denotes complication resolved in PACU & released same day as surgery)

DISCUSSION

In our retrospective analysis of patients less than 3 years old post-operative complications were generally mild and relegated most commonly to dehydration. There were no patients who experienced severe airway complications or hemmorhage in this present study and only two patients required an additional intervention in the recovery room.

The absence of major complications in our patient set may be attributable to:

- The major indication for T&A in this cohort was obstruction rather than infection--the latter associated with bleeding 2° to inflamation
- A trained "specialized" pediatric team vs general personnel
- Advancements in anesthetic usage recently shown to reduce postoperative morbidity (ie. dexamethasone to limit edema and subsequent airway problems)
- Nursing staff that performs obligatory follow-up phone calls addressing postoperative concerns before need for readmission

This data suggests that we may consider reevaluating the need for mandatory admission for all children less than three years of age undergoing tonsillectomy and adenoidectomy.

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