



Post tonsillectomy hemorrhage: Who needs intervention?



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ARTICLE INFO

Article history:

Received 15 August 2014

Received in revised form 25 November 2014

Accepted 29 November 2014

Available online 8 December 2014

Keywords:

Tonsillectomy

Hemorrhage

Children

Emergency

Intervention

Disposition

ABSTRACT

Background: Post-tonsillectomy hemorrhage (PTH) remains a significant complication. There are no guidelines for Pediatric Emergency Department (PED) disposition of children with secondary PTH.

Objectives: To describe the incidence, clinical characteristics and interventions required by children presenting to a PED with secondary PTH. To identify patient and clinical characteristics associated with need for operative/inpatient intervention.

Methods: Retrospective chart review of healthy children 1–18 years with secondary PTH from 2005 to 2012. Demographics, clinical and oropharynx findings, laboratory data, intervention type and ED disposition were recorded.

Results: We encountered 181 children with 193 episodes of PTH. One hundred and twenty one patients were included in the final analysis. Secondary PTH rate was 2.3%. Only a minority of patients were hypotensive (3.3%) or had hemoglobin < 10 g/dl (9.5%) at presentation. 65.3% Children had positive oropharyngeal exam: clot 39 (49.4%) patients; ooze 17 (21.5%) patients; ooze + clot in 5 (6.3%) patients or active bleeder in 18 (22.8%) patients. Eighty seven (71.9%) patients were admitted; 74 (61.1%) patients required active intervention: medical 14.8%, surgical 74.4% or both 10.8%. Thirty seven children needed immediate operative intervention. Only positive oropharyngeal exam and age ≥ 6 years were significantly associated with need for intervention. None of the patients with a confirmed normal oropharyngeal exam at the initial visit required any intervention either medical or surgical. The rate of return visit for recurrent PTH was found to be similar for both the admitted and the discharged group. No patient returned with a life threatening hemorrhage.

Conclusions: Majority of children with secondary PTH were admitted and nearly 3/5th of them required an intervention. Our data suggests that healthy children <6 years with a confirmed normal oropharyngeal exam are less likely to require an intervention and may be candidates for safe discharge from the ED provided reliability of return for recurrence can be assured.

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1. Introduction

Tonsillectomy with and without adenoidectomy is one of the most common surgical procedures performed by otolaryngologists with approximately 530,000 outpatient pediatric adenotonsillectomies performed annually in the United States [1]. Post tonsillectomy hemorrhage (PTH), either primary (occurring within the 24 h of surgery) or secondary (occurring after the first 24 h) remains the most significant complication. Despite advances in surgical techniques, PTH is seen in approximately 2% to 5% of all

patients who undergo tonsillectomy and adenoidectomy (T and A) [2–6]. Although rarely life threatening, PTH leads to increased morbidity, rarely mortality, significant parental anxiety, readmission to the hospital and possible need for another surgical intervention.

There is a paucity of evidence based literature for management and disposition of patients presenting to the Pediatric Emergency Department (PED) with PTH. As a result, majority of such children with PTH are admitted for inpatient observation irrespective of the severity of the bleeding episode. Studies by Peterson et al. [4] and Attner et al. [7] have shown that patients with a history of a single self-limiting PTH with no evidence of active bleeding at presentation to the PED are at a low risk of developing recurrent bleeding or requiring any medical or surgical intervention.

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These studies indicate that there may be a subset of children with secondary PTH who can be safely observed at home rather than being admitted to the hospital given the low risk of re-bleeding. The primary objective of our study was to describe the incidence, clinical characteristics and interventions required for children presenting to a tertiary care PED with secondary PTH. The secondary objective was to identify patient and clinical characteristics associated with need for inpatient intervention in children with PTH.

2. Material and methods

2.1. Study setting

We performed a retrospective chart review of all patients 1–18 years who presented to our PED with PTH over a 7 year period from Jul 2005 to June 2012. Our PED is an inner city, level 1 trauma center ED affiliated to a tertiary care free standing children's hospital where around 1000 tonsillectomies with or without adenoidectomies are performed annually by fellowship trained pediatric otolaryngologists.

All patients presenting to the ED with post tonsillectomy complications (fever, dehydration, PTH) are examined by both the ED physician as well as the ENT physician. The final decision on the disposition of the patient is made by the ENT physician. Till recently, our practice was to admit majority of patients presenting to the PED with secondary PTH for observation. Based on recent literature the criteria for potential discharge vs. admission were modified at our center and the decision was based on individual patient presentation. In general, patients with a reliable history of a minor secondary PTH, a confirmed normal oropharyngeal exam by the ED and ENT physician at presentation were considered for discharge. Patients who lived far from the hospital or had difficulty with transportation were admitted for observation. The caretaker was counseled regarding the risks and signs of potential recurrence prior to discharge. Since the patients had an established relationship with the ENT physicians on staff, reliability for follow-up was confirmed and established within the next week in clinic with the physician who performed the initial surgery.

During the study period, there was no established standard period of observation in the ED for patients who were discharged home. The patients remained in the ED until they were also examined by the ENT physician to confirm the oropharyngeal findings of the ED physician.

2.2. Study definition

For the study, secondary PTH was defined as any oral bleeding that occurred after the first 24 h following tonsillectomy with or without adenoidectomy that prompted a visit to the PED.

2.3. Inclusion criteria

Previously healthy children aged 1–18 years that presented to our PED with secondary PTH.

2.4. Exclusion criteria

Patients with (a) primary PTH (b) recurrent episode of PTH (c) other postoperative complications such as fever, dehydration, (d) co-morbid conditions that predispose them to increased risk of postoperative bleeding such as developmental delay, craniofacial anomalies, bleeding disorders, anti-coagulation therapy and (e) those with missing records or had initial surgery performed at different hospital or transferred from other centers.

2.5. Data collection

In the absence of any specific ICD codes for PTH, the hospital records were searched using the International Classification of Diseases, Ninth Revision (ICD-9) diagnostic codes (998.11, 998.12, and 998.13) for post-operative bleeding/hematoma/seroma/complications and cross matched with either consult or admission to the otolaryngology service. After a preliminary list of patients was acquired, all these medical charts were manually screened and reviewed by the principal investigator to identify the study population as per the inclusion criteria. The charts were also reviewed by a blinded separate reviewer for inter-rater reliability.

Data on patient demographics, indication for surgery, type of surgery, operative technique, history of primary bleeding, post-operative day of hemorrhage, clinical and laboratory findings at presentation and ED disposition (discharge, hospital admission, transfer to operating room) were collected. Details of inpatient management and type of intervention such as non-operative (fluid resuscitation defined as ≥ 2 normal saline bolus; blood transfusion; local hemostasis with cauterization) or operative intervention were also recorded.

Being one of the largest tertiary care pediatric centers with inpatient admission facility, most patients with secondary PTH are either directly or eventually transferred to our institute. The electronic medical records were reviewed for a follow-up period of 1 month post discharge from the ED for all the study subjects to record recurrent episodes of bleeding, return visits to the ED or adverse outcome.

2.6. Statistical analysis

Descriptive statistical analysis was performed to describe and summarize data. Categorically scaled variables are reported using percentages and ratios. Non-parametric Fisher's Exact Chi-square test was performed to compare differences between categorical variables. Logistic regression analysis was performed to predict the factors associated with need for operative intervention. Odds ratio of the predictor variables and 95% CI are reported. Logistic regression analysis requires a sample size of approximately 10 participants per variable to load into the final model for the model parameters to hold power. p -Values < 0.05 were considered significant. All statistical procedures were conducted using IBM SPSS Version 20.0.

3. Study results

During the study period, 6810 tonsillectomies were performed at our institution. 181 Patients with a total of 193 episodes of PTH presented to our ED during the study period. Of these 168 (87%) were secondary PTH episodes. Based on our inclusion criteria, 72 episodes of PTH were excluded: Primary PTH: 25; Return visit for recurrence: 12; Transferred patients/Incomplete records: 16; others: 19. Of the 168 secondary PTH episodes, excluding the 12 patients with return visits for recurrence, our annual secondary PTH rate was around 2.3%. Our final analysis included a total of 121 episodes of secondary PTH.

The demographic profile of study population, indication for surgery and surgery type is shown in (Table 1). 15 Patients were hemodynamically unstable at presentation. 11 (9%) Patients were persistently tachycardic and 4 (3.3%) patients were hypotensive at presentation. Amongst the 95 patients in whom routine hematology work up was obtained in the ED, a hemoglobin < 10 g/dl was noted in 9 (9.5%) patients with no bleeding diathesis identified in any of the patients in whom coagulation profile was obtained.

A total of 74 (61.1%) patients required either surgical and/or medical intervention for control of bleeding (Fig. 1). Amongst the

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