

Complications of tonsillectomy and adenoidectomy in 9409 children observed overnight

W.S. Crysdale, MD, FRCSC
D. Russel, MD

In attempts to minimize the cost of health care, physicians are reducing the duration of hospital stay. Traditionally, at the Hospital for Sick Children, Toronto, otherwise healthy children undergoing adenoidectomy, tonsillectomy or adenotonsillectomy have been admitted the morning of surgery and discharged from hospital at 7 am the next day. The nursing records of 9409 patients aged 17 years or less who were managed in this way between 1980 and 1984 were reviewed to determine the occurrence of complications during the observation period. A total of 202 patients (2.15%) bled during the observation period. Of the 202, 6 (0.06% of all the patients) required a second general anesthetic for hemostasis; 1 of these 6 patients and 5 others required blood transfusions. Discharge was delayed for 42 patients (0.45% of all the patients) because of postoperative bleeding and for 57 patients (0.6%) for a variety of other reasons. Delayed discharge for reasons other than hemorrhage was more frequent among children less than 2 years of age and those over 12 years of age. The authors concluded that children undergoing adenoidectomy could safely be discharged the same day after 6 hours of observation following surgery. However, as a substantial number of children bled from the tonsillar fossa more than 6 hours after surgery, the efficacy of periodic examination of the oral cavity during the observation period in reducing the rate of hemorrhage after 6 hours must be evaluated before a same-day discharge program is established for children undergoing adenotonsillectomy.

Par mesure d'économie, les médecins cherchent à raccourcir les séjours hospitaliers. À l'Hospital for Sick Children de Toronto il est de tradition que l'enfant chez qui on pratique l'adénoïdectomie, l'amygdalectomie ou les deux entre le matin même et quitte à 7 heures le lendemain matin. On étudie ici les dossiers infirmiers de

Dr. Crysdale is otolaryngologist-in-chief, Hospital for Sick Children, Toronto, and Dr. Russel is a resident in otolaryngology, University of Western Ontario, London.

Reprint requests to: Dr. W.S. Crysdale, Hospital for Sick Children, 6126-555 University Ave., Toronto, Ont. M5G 1X8

9409 sujets âgés de moins de 18 ans dont c'est le cas de 1980 à 1984, afin de connaître la fréquence de survenue des complications pendant la surveillance postopératoire. Ainsi 202 patients (2,15%) ont saigné, dont 6 (0,06% de tous sujets) ont été ré-anesthésiés pour fins d'hémostase; l'un de ces six, et cinq autres patients, ont nécessité la transfusion sanguine. On a différé le congé de 42 opérés (0,45%) pour cause d'hémorragie postopératoire et de 57 autres (0,6%) pour diverses autres raisons. Ces dernières ont existé plus souvent avant 2 ans et après 12 ans. Les auteurs croient que si l'enfant chez qui on pratique l'adénoïdectomie peut quitter en toute sécurité le jour de l'opération au bout de 6 heures d'observation, la survenue d'hémorragies des fosses amygdaliennes dans un nombre substantiel d'opérés de la gorge après un délai de 6 heures impose de rechercher si l'examen répété de la région opérée au cours de la période d'observation postopératoire est susceptible d'abaisser le taux d'hémorragies survenant au-delà des 6 heures. On saura alors s'il y a lieu d'instituer le départ de ces opérés le jour même.

The admission and discharge on the same day of patients who undergo surgery with general anesthesia has become much more prevalent during the past few years. Same-day discharge is associated with decreased costs, reduced risk of nosocomial infections and probably less psychologic trauma to the patients and family. Given these advantages, the question arises as to whether tonsil and adenoid surgery can safely be done as an outpatient procedure. A major disadvantage of this approach for this group of patients would be the shorter postoperative observation period.

To determine the occurrence of complications during the observation period, we reviewed the postoperative course of 9409 children who were admitted for tonsil or adenoid surgery, or both, the morning of surgery and remained in hospital overnight.

Methods

At the Hospital for Sick Children, Toronto, patients scheduled for tonsil or adenoid surgery or

both who are otherwise healthy arrive at the hospital on the day of surgery with completed forms documenting the history and the results of physical examination and laboratory tests as determined by the referring physician. The children are then taken to a playroom outside the operating room, where they await surgery.

After surgery the patients are taken to the postanesthesia recovery room, and approximately 2 hours later they are transferred to a special tonsil suite. Discharge from the suite is scheduled for 7 am the following morning. The length of stay varies from 15 to 22 hours, depending on when surgery is completed. In the recovery room or the tonsil suite the established practice during the period reviewed was for a nurse or physician to examine the oral cavity with a light source to determine whether bleeding was occurring only if there was a suspicion of bleeding (i.e., oozing of blood from the nose or mouth, noisy or "wet" respirations, vomiting of blood or deterioration of vital signs).

Children scheduled for tonsil or adenoid surgery who have other health problems, such as cardiac anomalies, compulsive disorders, chronic respiratory tract disorders, metabolic disorders or coagulopathies, are admitted the day before surgery and thus are not transferred to the tonsil suite.

We reviewed the nursing records of 9409 patients aged 17 years or less who were managed in the tonsil suite between 1980 and 1984. During this period approximately 2400 other children underwent tonsil or adenoid surgery, but their records were not reviewed as they had other medical problems that necessitated their admission to hospital the day before surgery. The records of patients who bled or hemorrhaged during their stay or whose discharge was delayed beyond 7 am the following morning were reviewed in detail. Primary postoperative hemorrhage was defined as any hemorrhage in the first 24 hours after surgery for which medical attention was sought and hemostatic intervention was required, whether in the tonsil suite or in the operating room.

The study was designed only to estimate the frequency of complications during the usual period of observation in an overnight stay. It did not address the possibility of readmissions after discharge at the usual time.

Adenoids were removed by curettage, and tonsils by the dissection technique. Hemostasis

was obtained by packing, cauterization with silver nitrate, ligation or suture; electrocautery was not used. Ten staff otolaryngologists and approximately 40 residents in otolaryngology performed the operations. No attempt was made to determine whether there were statistically significant variations in complications associated with individual staff surgeons or groups of physicians. Many anesthetists, both staff and residents, were involved in the care of the patients; the anesthesia records were not reviewed.

Results

Of the 9409 procedures performed, 267 were for tonsillectomy alone, 1435 for adenoidectomy alone and 7707 for adenotonsillectomy. Hemorrhage occurred in 202 patients (incidence rate 2.15%) — 10 (3.74%) of the patients who underwent tonsillectomy, 3 (0.21%) of those who underwent adenoidectomy and 189 (2.45%) of those who underwent adenotonsillectomy. The site of bleeding in the patients who underwent adenotonsillectomy was the tonsillar fossa in 67%, the nasopharynx in 27% and both areas in 7%.

Treatment of primary hemorrhage is first attempted on the ward by suction removal of persistent clots, application of pressure with a sponge soaked in adrenalin and bismuth subgallate to the bleeding area, instillation of phenylephrine hydrochloride into the nasopharynx or silver nitrate cauterization of the bleeding points. This approach was successful in 97% of cases; however, in 10% of those in which bleeding was initially controlled hemorrhage recurred and required repetition of the procedure. Six of the 202 patients (0.06% of all the patients) required a second general anesthetic for hemostasis (Table I). One of these patients and five others required blood transfusions.

Eighty-five patients bled within the first 3 hours following surgery, and an additional 68 bled in the next 3 hours. Thus, 76% of the hemorrhages occurred in the first 6 hours following surgery. In the next 3-hour period 23 further patients (11%) bled. The remaining 26 cases (13%) occurred before the scheduled discharge time. Most of the patients were discharged before 24 hours after surgery, and none of these were readmitted for the management of hemorrhage that had occurred before discharge.

Table I — Features of six patients who hemorrhaged following tonsil or adenoid surgery or both and who required a second general anesthetic for hemostasis

Patient	Age, yr	Time after surgery, h	Site of bleeding
1	6	0.5	Tonsillar fossa
2	9	1.0	Nasopharynx
3	10	1.5	Tonsillar fossa
4	5	1.5	Tonsillar fossa
5	6	3.0	Nasopharynx
6	10	4.5	Nasopharynx

Of the 202 patients who bled, 42 (0.45% of all the patients) had their discharge delayed because of bleeding. The length of additional time that they spent in hospital for continued treatment or observation was less than 12 hours for 13 patients, less than 24 hours for 27 patients and more than 24 hours for 2 patients.

Fever (temperature higher than 38.5°C) occurred in 245 (2.6%) of the patients. Persistent emesis, even after old blood had been cleared, necessitated treatment with an antiemetic in 292 (3.1%).

Fifty-seven patients (0.6% of all the patients) remained in hospital beyond the scheduled discharge time for reasons other than hemorrhage (Table II). Of the 15 patients in the "other" category, 10 had their discharge delayed for non-medical reasons such as parental anxiety and transportation problems. Delayed discharge for reasons other than hemorrhage was more frequent in children less than 2 years of age and those over 12 years of age (Table III).

Patients under 4 years of age had a lower relative frequency of bleeding; however, the incidence of fever, inadequate oral intake and airway distress was higher in this age group. The teen population had a higher incidence of pain as well as a higher relative incidence of hemorrhage.

Discussion

From a review of over 20 000 cases, Capper and Randall¹ reported incidence rates of primary hemorrhage necessitating a return to the operating room for hemostasis of 0.34%, 0.29% and 0.88% for patients who underwent adenoidectomy, tonsillectomy and adenotonsillectomy respectively.

Table II — Reasons other than hemorrhage for delayed discharge in 57 patients

Reason	No. of patients
Fever	17
Airway distress	7
Pneumonia	6
Inadequate oral intake	5
Vomiting	4
Pain	3
Other	15

Table III — Distribution of surgical procedures, primary hemorrhage and delayed discharge for reasons other than hemorrhage, by age of children

Variable	Age, yr; % of children			
	≥ 2	3-4	5-12	13-17
Procedures (n = 9409)	6.0	40.0	49.0	5.0
Primary hemorrhage (n = 202)	3.5	35.5	53.0	9.0
Delayed discharge for reasons other than hemorrhage (n = 57)	16.0	46.0	30.0	9.0

Carmondy and colleagues² reported that 0.9% of adolescents and children who underwent tonsillectomy required a return to the operating room for hemostasis. Only 3% of our patients who bled postoperatively (0.06% of all the patients) were returned to the operating room for management. Only 0.21% of the patients who had adenoid surgery alone bled, compared with 3.74% of those who had tonsillectomy alone and 2.45% of those who had adenotonsillectomy. We have no explanation for the lower rate in patients who had adenoidectomy alone.

The time at which initial primary hemorrhage occurs is critical in establishing an optimal postoperative observation period. In centres that perform outpatient adenotonsillectomy, the observation period ranges from 3.5 to 6 hours.³⁻⁷ In contrast, Capper and Randall¹ recommended in-hospital observation until the second postoperative day. Had our patients been observed for only 6 hours, primary hemorrhage would have occurred after discharge in 49, or about 1 patient of every 200. However, all patients who required a second general anesthetic for hemostasis were returned to the operating room within 6 hours after surgery. The fact that the nasopharynx is less amenable than the tonsillar fossa to local hemostatic measures in the ward may explain why the numbers of patients with bleeding from each area who required a second anesthetic for hemostasis were equal, even though bleeding from the nasopharynx is much less common.

Bleeding will probably be detected early only if there are established times of observation or examination of the patients by nursing staff during the postoperative period. Different nursing care procedures from those used in this group of patients would have altered the time at which bleeding "occurred" or, in other words, was detected. The oral cavity of all patients should be examined with a light source before they leave the recovery room and at set intervals (30 to 60 minutes) for an established period (6 hours) after surgery. The oral cavity should also be examined before discharge if the patient is to be discharged the day of surgery. This type of nursing protocol — active observation — must be instituted by any hospital contemplating a same-day discharge program.

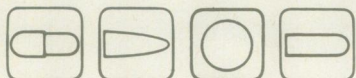
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adenotonsillectomy has increased since Chiang and associates⁶ reported their series of 40 000 outpatient tonsillectomies, in 1968. The rate of admission to hospital as a result of surgical complications following an outpatient surgical procedure has been reported to range from 1.7% to 3.4%.⁴⁻⁷ Primary hemorrhage accounted for 0.7% to 1.7% of delayed discharges. In our series the overall rate of delayed discharge was 1.05%.

With early discharge after outpatient adenotonsillectomy, postoperative care after discharge is necessarily the responsibility of the parents. Therefore, the attitudes and capabilities of the parents should be considered in selecting patients for same-day discharge. In addition, the patients should have no other significant medical problems, and the family should have ready access to medical facilities.

We have no information on the incidence of complications after discharge. Since the frequency of primary hemorrhage decreased steadily following surgery, we assume that such complications were rare.

Our findings suggest that adenoidectomy can be safely done as an outpatient procedure. Before a same-day discharge program is instituted for adenotonsillectomy, active observation should be implemented and monitored for a trial period to determine whether these changes in postoperative care significantly reduce the rate of hemorrhage after 6 hours following surgery. If the rate were reduced, adenotonsillectomy could be done as an outpatient procedure in children who live within 25 km of the hospital, who are observed for at least 6 hours after surgery and who, during the observation period, have good oral intake, a temperature of 38.5°C or less and no airway distress.

References

1. Capper JWR, Randall C: Post operative hemorrhage in tonsillectomy and adenoidectomy in children. *J Laryngol Otol* 1984; 98: 363-365
2. Carmondy D, Vamadevan T, Cooper SM: Post tonsillectomy hemorrhage. *J Laryngol Otol* 1982; 96: 635-638
3. Natof HE: Complications associated with ambulatory surgery. *JAMA* 1980; 244: 1116-1118
4. Ahlgren EW, Bennett EJ, Stephan CR: Outpatient pediatric anesthesia. *Anesth Analg (Cleve)* 1971; 50: 402-408
5. Segal C, Berger G, Basker M et al: Adenotonsillectomies on a surgical day clinic basis. *Laryngoscope* 1983; 93: 1205-1208
6. Chiang TM, Sukis AE, Ross DE: Tonsillectomy performed on an outpatient basis. *Arch Otolaryngol* 1968; 88: 105-108
7. Lee IN: Outpatient management of T&A procedures in children. *J Otolaryngol* 1985; 14: 176-178

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