

Outpatient tonsillectomy: a prospective 7 years study—complications and comparison with inpatients

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Received 14 April 1998; accepted 20 June 1998

Abstract

Tonsillectomy is the most common major surgical procedure performed on children in some countries. In a prospective study over 7 years we compared the incidence of complications in 313 inpatient and 113 outpatient tonsillectomy cases, in children from 3 to 15 years. The mean surgery time in outpatients was 23 min and discharge was 115–223 min after surgery. Complications occurred in 1.65% of inpatients and 1.76% of outpatients (two unexpected admissions for haemorrhage and anaesthetic complication). All complications were less in outpatients. We conclude that tonsillectomy is a safe procedure in children ASA I–II more than 3 years old. Complications are few and not dependent on age. Discharge is possible 4 h after surgery. © 1999 Elsevier Science B.V. All rights reserved.

Keywords: Tonsillectomy; Day-case surgery; Outpatient surgery; Complications; Safety; ENT

1. Introduction

Tonsillectomy is the most common major surgical procedure performed on children in some countries. In the USA it accounts for a least 390000 operations a year in the UK no more than 85000 a year [1,2]. Traditionally it has been performed as an inpatient procedure with discharge on the first postoperative day.

Complications after tonsillectomy are infrequent. The most serious complications being haemorrhage (0.10–8%) [3–7] and acute compromise of the airway (0–20%) [6–10]. Other postoperative problems are poor oral fluid intake with or without dehydration, pain, vomiting and fever. The total incidence varies from 0.30–10% [2,6–9,11,12,15]. Possibly, complications increase if patients are less than 36 months of age [13–15].

At present, because of health-care cost savings tonsillectomy is undertaken as outpatient surgery in some

centres [8–11,13,14,16–25] and discussions and safety are increasing. Prospective studies about safety in outpatients are few.

We present a prospective 7 years study made at the Viladecans Hospital, to examine the safety of outpatient tonsillectomy, recording the complications in the 2 weeks after surgery. Results are compared to inpatient surgery and the current literature.

2. Patients and method

The study included all patients 3–15 years old, that underwent tonsillectomy with or without adenoidectomy, under general anaesthesia from January 1, 1991 to January 1, 1998.

Patients had inpatient or outpatient tonsillectomy depending on patient and parents preference, and specific conditions for ambulatory surgery such as, phone for postoperative control, adequate family environment, no psychiatric disease or difficulty in understanding orders, and no severe accompanying pathology (ASA III–IV) [22,26].

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The ambulatory surgery unit is located on the third floor of our hospital, in an independent area. There are two operating rooms eight first stage recovery beds and eight second stage recovery beds.

The sequence of events for outpatients are: (a) ENT surgeon consultation. History data, physical examination and enrolment for surgery (inpatients or outpatient). Parents and patient (only teenagers) write consent. Preoperative study according to the ASA (American Society of Anesthesiology), (b) Anaesthesiologic visit (day surgery area). History, physical examination and preoperative tests evaluation. (c) Nursing staff interview (immediately after anesthesiologist visit), information and explanations about day-surgery area and surgery. A nurse telephones the patient's home 1–5 days before surgery. If the child had any problem further checks are undertaken. (d) Admission to the day-surgery area.

Surgical technique was tonsillectomy by dissection and snare. Hemostasis was obtained with suture ligation of the tonsillar fossa. Adenoidectomy was performed using a curette or adenotome, and hemostasis was obtained using intraoperative nasopharyngeal packing.

All anesthesia was general. Intranasal administration of midazolam (0.2 mg/kg) was used to obtain sedation in pre-school children. Anaesthesia was induced by propofol (3 mg/kg) and succinylcholine (1 mg/kg) and maintained by propofol or halothane. In the last year the anaesthetic agent sevoflurane was also used. Tracheal intubation was used. After surgery and before the patients left the operating room, gastric contents were evacuated with a nasogastric tube. Postoperative pain was treated with paracetamol. No patient received meperidine.

In the first stage recovery room, patients were monitored by the nursing staff, and oral fluid intake started gradually 30–60 min after surgery. Parents accompanied their children in the second recovery room. Discharge was undertaken 3–6 h after surgery when the patients were, stable and free of complications (no surgical complications, and meeting modified postanesthesia discharge scoring system (PADASS) and nursing criteria). Poor oral fluid was not a criteria for delayed discharge.

All incidents were recorded by nursing staff in the two recovery areas.

Written instructions concerning home care were given, and patients had a personalised postoperative control. In all cases a nurse telephoned the patient's home on the first postoperative day and surgeons visited the patient 2 weeks after. Other contents or visits in the postoperative were according to medical orders. Parents had a special telephone number to call to request further advice, and the emergency area of our hospital dealt with and reported complications and

re-admission. Immediate and additional surgical procedures during the first post operative weeks (e.g. for delayed bleeding), anaesthetic complications (e.g. delay in waking up), compromised airway, high temperature (more than 38°C), pain that needed additional treatment, poor oral fluid intake and vomiting, were considered complications or incidents and recorded.

Differences in the sequence of events for inpatients were: (a) visits were not in the day-care area, (b) did not have personalised nursing staff or telephone checks and (c) discharge occurred on the first postoperative day. Other procedures and controls were similar.

3. Results

From January 1, 1991 to January 1, 1998 tonsillectomy was performed in 445 patients, (332 inpatients and 113 outpatients). Tonsillectomy comprised 10% of total outpatient ENT surgery and the 4% of total ENT surgery.

Excluding ASA III–IV patients (only outpatients) we had two groups of 313 and 113 patients respectively. The mean age of inpatients was 6 years (65.66% from 3 to 7 years), with 181 males (56.6%) and 132 females (43.4%). The mean age of outpatients was 5.67 years (72.1% from 3 to 7 years), with 67 males (59%) and 46 females (41%). They were two homogeneous groups.

Time of surgery varied from 13 to 48 min (including adenoidectomy), with a mean of 23 min. Discharge was from 115 to 223 min after surgery, (mean 173 min).

Inpatient complications amounted to 1.65%: two reinterventions for immediate bleeding, one delayed bleeding 8 days after surgery, and two delayed discharge for 24 h for observation (discrete haemorrhage and fever more than 38°C). No haemorrhage produced hypovolemia or needed blood transfusion. No discharge was delayed for dehydration, but four patients (1.27%) had delayed oral intake fluid because of dysphagia (1) or vomiting (3). No admissions occurred for pain, but it was said to be an important problem by 30% of patients. Fever less than 38°C was present in 24 cases.

Outpatient major complications were two (1.76%): one haemorrhage that needed surgical revision and one anaesthetic complication (delayed in waking up) Surgery times were 45 and 10 min respectively. Discharge was delayed 24 h in the two cases. No readmission occurred in the 2 weeks after surgery. In this time, eight outpatients needed more analgesia for severe pain, one child presented vomiting and two children had fever less than 38°C.

In the total series the incidence of haemorrhage was 1.24% (1.65% for inpatients and 0.88% for outpatients). Primary bleeding occurred in 0.95% and delayed bleeding in 0.31%. Additional surgery was necessary in

Table 1
Complications, age of patients and surgery's time (*S* = minutes)

Cause	Inpatients (<i>n</i> = 313)	Outpatients (<i>n</i> = 113)
Immediate bleeding	3 years (<i>S</i> = 7) 15 years (<i>S</i> = 22)	10 years (<i>S</i> = 43)
Delayed bleeding	9 years (<i>S</i> = 12)	—
Delayed discharge (24 h admission in outpatient)	7 years—fever (<i>S</i> = 20) 15 years—observation discreet bleeding (<i>S</i> = 28)	4 years—anaesthetic complication (<i>S</i> = 20) 10 years—immediate bleeding
Delayed oral fluid intake	12 years (dysphagia) (<i>S</i> = 17)	—
Vomiting	4 years (<i>S</i> = 15) 5 years (<i>S</i> = 28) 5 years (<i>S</i> = 12)	4 years (<i>S</i> = 10)
Analgesia (more than standard)	30%	4 years (<i>S</i> = 15) 4 years (<i>S</i> = 12) 5 years (<i>S</i> = 28) 6 years (<i>S</i> = 15) 6 years (<i>S</i> = 10) 8 years (<i>S</i> = 28) 14 years (<i>S</i> = 22) 14 years (<i>S</i> = 15)
Fever (less than 38°C)	24 cases (7.66%)	5 years (<i>S</i> = 7) 6 years (<i>S</i> = 12)

0.95%. Pain was said to be an important problem by 30% of patients, but only 6.88% needed more analgesia. Vomiting was present in 0.88% of the total patients, and fever was less than 38°C in the 6.10% of patients.

See complications, age of patients and surgery times in Table 1.

4. Discussion

The incidence of delayed discharge, unexpected admissions and complications in day-cases varies from 0.20% to 9.35% [27–29] in the current bibliography. Ogg [29] presented in 1997 a series of 425 cases (1.36%) that required direct hospital admission following surgery in 31195 day operations. Post-tonsillectomy complications made up an important percentage of total complications (4.62%–17.21% [12,19,29]). In our series they accounted for only 3.7% of the total day surgery complications.

Some points are controversial in the literature about outpatient tonsillectomy: time of discharge after surgery, age, oral fluid intake and SAS.

4.1. Time of discharge after surgery

Prospective studies in outpatient tonsillectomies are few [8,9,14,25,30]. The most important series are inpatients revisions that measures safety according the complications in the 4, 6, 10 or 24 h after surgery and in the

hypothesis that discharge was done in this times (supposed outpatients). Carithers [5] (2613 inpatients in 1987) stated that the procedure was safe if discharge was 10 h after surgery, and in his series the possibility of readmission if discharge was 4 h post-operatively was 25%. Helmus [1] (788 same-day patients in 1990) and Yardley [2] reported that was safe 8 h after surgery. Guida [21] with discharge after 6 h had a 3.8% complication rate (804 inpatients in 1990). Only 20% of tonsillectomies in Contencin's [23] series (259 inpatients in 1995) were deemed to be safe for outpatient surgery, and for Drake–Lee [30] the figure was 50% (500 inpatients in 1997).

In our outpatients the mean discharge time was 173 min (the most delayed 223 min) after surgery. In the total series (313 inpatients and 113 outpatients) all immediate complications occurred before 3 h after surgery. In consequence, we think that discharge is safe 4 h postoperatively.

4.2. Age of patients

For some authors the 3 years in a security barrier of possible complications in tonsillectomy. The rate of unexpected admissions varies in outpatient and prospective studies from 0.37% [10] to 3.36% [12]. This is reported to increase to 9% [14] if patients are younger than 3 years. Causes were haemorrhage (primary or delayed), pain, vomiting and fever. Our admission rate was 1.76%. The concept of unexpected admission is not possible in inpatients that stay overnight.

Table 2
Incidence ratio complications

	Outpatient	Our serie (n = 113)	Inpatient	Our serie (n = 113)
Primary bleeding	0.83% [8]–5.2% [25]]	0.88%	0.1% [31]–2.15% [3]	0.63%
Delayed bleeding	0.37% [10]–0.49% [25]	0	1.3% [21]–6.4%[11]	0.32%
Additional surgery	0.83% [8]	0.88%	0.08% [19]–13% [32]	0.63%
Vomiting	0.6% [15]–2.5% [12]	0.88%	1.7% [8]–62% [21]	0.95%
Pain	9.7%–17%	6.88%	—	30%
Fever (less than 38°C)	0.18% [10]–20% [25]	1.76%	0.24% [18]–1.4% [21]	7.66%
Anaesthetic complication	14% [12]–15.7% [35] of total complication	0.88%	—	—

Delayed discharge is reported to be from 1.8% [21] to 2.42% [11] in inpatients and from 0.37% to 0.49% [21] in outpatients (52.4% [13] in children younger than 3 years). Our rate was 1.27% in inpatients. On reviewing the literature, age appears not to be an important factor in other complications, expect for oral fluid intake and SAS problems.

4.3. Oral fluid intake

Poor oral intake varies from 1% [11] to 8.5% [5] in inpatients and from 3.7 to 10% in outpatients. Patel [31] affirms that fluid intake was higher in overnight patients because intravenous fluid administration was longer than in outpatients and this is the cause of a minor number of complications. This point is contradicted. For Rothschild [32] the mean time to oral intake was 26.5 h in children younger than 4 years and for Schreiner [33] children should not drink before discharge because intravenous fluid administration is enough.

In our day-case area, oral fluid intake is not considered a discharge criteria in children and was not the cause of delayed discharge in any outpatient is this study. Oral intake is only a proof of adequate deglutation.

4.4. SAS

Recurrent infection was the first indication for tonsillectomy 20 years ago. Actually more than 19% of indications are airway obstruction [34] that in some cases cause nocturnal apnoeas. Reiner [20] compared two groups of children with obstructive apnoea undergoing inpatient and outpatient tonsillectomy. Overall complication rates were 6.5% and 3.6% respectively (children younger than 4 years). In our experience the risk of complications following surgery is not increased and we don't undertake polisomnography and sleep studies if patients are not obese. None of our patients presented airway complications.

The incidence of other complications is similar in our series to that in the literature (see Table 2). Complica-

tions fates are if higher follow-up is prolonged to 1–2 weeks [26], and varies depending on factors such as the experience of the surgeon size of the series and the accuracy of selection. One study suggests that the complication rate is higher in docent [35] and the integrate hospital units that in Freestanding [36].

5. Conclusion

1. Tonsillectomy is safe. Outpatients complications are few.
2. Discharge is possible 4 h after surgery.
3. Age has no influence on the complications rate (children older than 4 years)
4. Oral intake is not a necessary discharge criteria in children
5. Nocturnal apnoea due to obstruction is an indication for tonsillectomy and does not increase the risk of complications.

Acknowledgements

The author wishes to thank Maite Mañoso, Salvador Amat and Fernando Sancho for their contributions to this work.

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