

Paediatric day-case tonsillectomy: a three-year prospective audit spiral in a district hospital

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Abstract

Background: Paediatric tonsillectomy is a common ENT operation. The use of day-case surgery is increasing, in order to improve efficiency in healthcare.

Methods: A prospective audit spiral was carried out from January 2006 to December 2008 for all children undergoing day-case tonsillectomy at Huddersfield Royal Infirmary.

Results: There was a haemorrhage rate of 2.6 per cent over three years. The most common complication was nausea and vomiting, seen in 5.3 per cent of patients.

Conclusions: For a well selected group of children, day-case tonsillectomy in a district hospital setting is a safe and efficient alternative to an in-patient stay. A dedicated day-case team, good anaesthetic technique, adequate post-operative analgesia and on-site paediatric in-patient facilities are essential.

Key words: Tonsillectomy, Child; Day Care; Paediatrics

Introduction

Tonsillectomy is one of the commonest ENT operations. In 1990, the audit commission recommended that more surgical procedures should be done as day cases.¹ In a drive to increase UK National Health Service (NHS) efficiency, more tonsillectomies are now being performed as day-case procedures.^{2,3} This is particularly true in children, given the recognised lower incidence of complications compared with adults.^{4,5}

Day-case surgery requires a shorter hospital stay and less nursing input, and enables cost savings, thus making it very appealing to UK NHS management. The benefits for patients and carers include shorter waiting times, reduced length of stay, and a reduction in cancellations due to bed shortages. Initially, the Royal College of Surgeons of England rejected day-case tonsillectomy due to the risk of reactionary haemorrhage.⁶ However, since then various studies have shown that the incidence of primary haemorrhage in children remains low, at 0.5–6.2 per cent,^{7–10} and that the majority occur within the first 6 to 8 hours.^{4,5,11} The *National Prospective Tonsillectomy Audit* reported on 40 531 patients (adults and children), and found a post-operative haemorrhage rate of 1.3 per cent and a return to theatre rate of 1 per cent, for ‘cold steel’ dissection and haemostasis with ties.¹² Clearly, the feasibility of day-case paediatric tonsillectomy

depends on the safety of the procedure and its acceptance by the patients and their parents.¹³

This study reports a prospective, three-year audit spiral of paediatric day-case tonsillectomies in a district hospital and compares the results with published data.

Patients and methods

All children undergoing tonsillectomy at the day surgery unit at Huddersfield Royal Infirmary under the care of the senior author (CN) were included in this study. A prospective audit spiral was carried out from January 2006 to December 2008. The children were listed for day-case tonsillectomy based on a protocol adapted from the Royal College of Surgeons of England guidelines for day-case surgery.⁶

The exclusion criteria for this study are detailed in Table I. In this study, children were excluded if they had sleep apnoea, established from their clinical history or on the basis of a sleep study. These children were operated on as in-patients.

The anaesthetic protocol used for these procedures (Table II) was adapted from the protocol published by Church.¹⁴ The main differences were the use of laryngeal mask airways and dexamethasone in our protocol.

The tonsillectomies in this study were usually done by the same team of surgeons and anaesthetists. The operation was done in all cases using the cold steel

TABLE I
EXCLUSION CRITERIA FOR DAY-CASE
TONSILLECTOMY

Criteria
Age <3 years
Weight <15 kg
Previous quinsy
Obstructive sleep apnoea
Home >30 min car drive from hospital
No access to telephone or car at home
Child with only 1 adult at home for night after surgery
Min = minutes

TABLE II
ANAESTHETIC PROTOCOL

Intervention	Protocol
Premedication	Paracetamol, ibuprofen, midazolam (if necessary), Ametop*
Induction	IV propofol or inhalational sevoflurane
Airway	Laryngeal mask airway if >20 kg Oral endotracheal tube if <20 kg
Intra-op drugs & fluids	Fentanyl, morphine, ondansetron, dexamethasone, IV fluids 15–20 ml/kg
Post-op analgesia	All: paracetamol, ibuprofen Rescue: codeine, morphine

*Smith & Nephew Healthcare Ltd, Hull, UK. IV = intravenous; intra-op = intra-operative; post-op = post-operative

TABLE III
TONSILLECTOMY PATIENT NUMBERS

Year	Patients (n)
2006	79
2007	90
2008	58
Total	227

dissection technique, with ties at the lower poles. Haemostasis was achieved with ties and minimal bipolar diathermy. All the operations were done in the morning, and children were observed for 6 hours post-operatively. If there was no bleeding and no other complications and they were managing to eat, they were discharged home. Patients' carers were then followed up by telephone the following day and a pain score was recorded for each patient using a Likert scale of 0–3 (0: no pain; 1: mild; 2: moderate;

TABLE V
OVERNIGHT ADMISSIONS

Year	Patients (n (%))
2006	3/79 (3.8)
2007	2/90 (2.2)
2008	2/58 (3.4)
Total	7/227 (3.1)

3: severe pain). The carers were also asked about the child's oral intake, any episodes of bleeding or vomiting, and any other problems.

For each patient, prospective data were collected including age, complications encountered, overnight stay if required, post-operative pain score, and any episodes of post-operative bleeding.

Further telephone follow up was conducted by a nurse specialist at one month post-operatively, specifically asking about any episodes of bleeding during this period.

Results

In this study, we report results for three separate prospective audits and also the cumulative results. Over the three years, the total number of patients included in this study was 227 (Table III). The age range was three to 15 years.

The main complications in this study were bleeding, nausea and vomiting. The most common complication was nausea and vomiting, which was seen overall in 5.3 per cent of patients (Table IV). The cumulative primary haemorrhage rate was 2.6 per cent, all of which occurred within the first 6 hours. None of these patients had to return to theatre for haemostasis, and all were treated conservatively. Post-operatively, 4.4 per cent of patients had problems with pain control and poor oral intake (Table IV). The overall complication rate within the first 24 hours was 13.2 per cent.

Over three years, 3.1 per cent of children had to be admitted overnight for observation (Table V). No cases of secondary haemorrhage were reported after the initial hospital discharge.

Telephone follow up was attempted for all the patients. Overall, 86.8 per cent (197/227) of carers could be contacted for follow up (86.1 per cent in 2006; 88.9 per cent in 2007 and 84.4 per cent in 2008). Their responses showed that the majority of

TABLE IV
COMPLICATIONS AFTER TONSILLECTOMY

Year	1° haem	N&V	Poor OI and pain	Other	All
2006	1/79 (1.2)	4/79 (5.1)	3/79 (3.8)	1/79 (1.2)	9/79 (11.4)
2007	4/90 (4.4)	6/90 (6.7)	5/90 (5.5)	1/90 (1.1)	16/90 (17.8)
2008	1/58 (1.7)	2/58 (3.4)	2/58 (3.4)	0/59 (0)	5/59 (8.5)
Total	6/227 (2.6)	12/227 (5.3)	10/227 (4.4)	2/227 (0.8)	30/227 (13.2)

Data represent patient numbers (percentages). 1° haem = primary haemorrhage; N&V = nausea and vomiting; OI = oral intake

TABLE VI
POST-OPERATIVE PAIN ON FOLLOW UP

Year	None	Mild	Moderate	Severe
2006	37/68 (54.4)	24/68 (35.3)	6/68 (8.2)	1/68 (1.5)
2007	45/80 (56.2)	26/80 (32.5)	6/80 (7.5)	3/80 (3.7)
2008	28/49 (57.1)	16/49 (32.6)	4/49 (8.1)	1/49 (2.0)
Total	110/197 (55.8)	66/197 (33.5)	16/197 (8.1)	5/197 (2.5)

Data represent patient numbers (percentages).

patients had minimal pain during post-operative recovery (Table VI).

Discussion

Most ENT operations are well suited to a day-case approach in a district hospital setting.¹⁵ The use of day-case surgery is increasing in order to improve efficiency in healthcare.⁵ Day-case tonsillectomy in children has been demonstrated by numerous studies to be a safe alternative to in-patient surgery.^{16,17} Children under three years of age require more careful observation and are more likely to have complications, especially reluctance to eat or drink; such children need to be observed overnight,¹⁶ more so if they have obstructive sleep apnoea.¹⁸ A similar study to ours has highlighted the role of a home-care team in improving the safety and efficacy of the procedure.⁷ In our study, we used a telephone review of all the patients one day after the surgery, a method that has been previously reported in the literature.¹⁹

Our prospective audit spiral demonstrated a primary haemorrhage rate of 2.6 per cent over three years, which is comparable with other studies (reporting 0.5 to 6.2 per cent).⁷⁻¹⁰ The overall complication rate in the first 24 hours post-operatively was 13.2 per cent, which was higher than reported in the literature (i.e. 5.6–9.3 per cent).^{9,11,20} However, the majority (73.3 per cent) of the complications in our study consisted of nausea and vomiting, poor oral intake, or poor pain control. The vast majority (89.3 per cent) of patients followed up by telephone complained of no or only mild pain. This demonstrates adequate analgesia on discharge, and is also comparable to other studies.^{8,21} A recent Cochrane review concluded that nausea and vomiting were significantly reduced when non-steroidal anti-inflammatory drugs were used, compared with alternative analgesics, without causing any increase in bleeding requiring a return to theatre.²² In this study, we observed the children for 6 hours post-operatively. The overall overnight admission rate was 3.1 per cent, which is in keeping with the published incidence of 3–8 per cent.^{7,8,10,20,23}

In our study, all patients were anaesthetised by the same paediatric anaesthetist. These children were fit and healthy (i.e. American Society of Anesthesiologists category one or two). At the end of this audit spiral, we had resumed the use of the

morphine; when its use was ceased for a time, patients' oral intake was not as good post-operatively, although there was less post-operative nausea and vomiting. In all our patients, anaesthesia was maintained with oxygen and sevoflurane. Nitrous oxide can contribute to post-operative nausea and vomiting, although not very much in children. It is a good intra-operative analgesic, which is why it is useful at the start of a stimulating procedure, to help keep the patient deeply anaesthetised while the gag goes in; after this point, we switch to air.

- **Use of day-case surgery is increasing, in order to improve healthcare efficiency**
- **This prospective audit found a post-tonsillectomy primary haemorrhage rate of 2.6 per cent over three years**
- **The commonest complication was nausea and vomiting**
- **District hospital day-case tonsillectomy is a safe, efficient alternative to in-patient care**
- **Appropriate patient selection, a dedicated day-case team, good anaesthetic technique, adequate post-operative analgesia and on-site paediatric in-patient facilities are essential**

Our study adds to the argument that, for a well selected group of children, day-case tonsillectomy is a safe and efficient alternative to an in-patient stay. It also demonstrates that, at a time in the UK when ENT services are becoming increasingly centralised, the district hospital has a significant role in providing easily accessible healthcare services.

Conclusion

Paediatric day-case tonsillectomy in a district general hospital setting is a safe procedure when performed with strict pre-operative criteria, a dedicated day-case team, good anaesthetic technique, adequate post-operative analgesia, and paediatric in-patient facilities on site.

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