

The Successful Implementation of Day Case Tonsillectomy

I. O'Riordan, S. Garry, J. Wauchope, H. Lehane, M. Mitchell, C. Heffernan, E. Phelan

Children's Health Ireland at Temple Street, Dublin 1.

Abstract

Objective

Day case tonsillectomy is standard practice in many international centres, and is widespread across the UK. In Ireland, implementation has been slow for multiple reasons. Our unit aimed to introduce day case tonsillectomy, following a pilot programme. Following a year of implementation we have reaudited our practice. We hypothesised that day case tonsillectomy is a practical and favourable solution to facilitate access to surgery in the context of long waiting times for ENT surgery.

Methods

This was a prospective audit collecting data on day case tonsillectomy. All patients for day case tonsillectomy were selected in OPD according to our inclusion criteria. We recorded demographical data, surgical technique, length of stay, failed discharges, bleeding rate and readmission rate.

Results

There was one primary haemorrhage within 24 hours of surgery (0.08%). There were 16 secondary bleeds, giving a rate of 13.9%. Of these, four patients required a return to theatre for the cessation of bleeding (3.5%). There was no statistical significance in bleed rate between surgical technique. Failed discharge rate was 6%. The average time from extubation to discharge was 6 hours and 53 minutes.

Conclusions

Our experience of day case tonsillectomy is that it is safe, feasible and efficient in a selected group of patients. This can expedite long waiting times for tonsillectomy, and improve access to overnight beds for other cases. Our numbers represent the first unit in Ireland to have 2 year of experience with data showing successful implementation.

Introduction

Tonsillectomy is one of the most common surgeries performed in Ireland. In 2017 alone, 3,690 tonsillectomies were performed, and 75% of these were in paediatric patients¹. Day case tonsillectomy was first suggested as an alternative in the late 1980s. In the early 1990s, several studies were performed which demonstrated the safety and practicality of performing tonsillectomy as a day case². However, it was not until many years later that it was successfully implemented in the UK and it is still not routine practise in Ireland. There are multiple factors cited for this. The time to hospital is often considered a significant barrier, specifically for patients from rural areas³. There is also concern regarding the risk of a post-operative primary haemorrhage, or parental unwillingness to have surgery done as a day case. However, it would appear, in the international literature, that parents are mostly satisfied with day case surgery⁴ and with appropriate patient selection, preoperative counselling and aftercare this service can be successfully implemented.

In the paediatric age group, the indication for tonsillectomy falls into two categories – recurrent infections and obstructive sleep apnoea. In the United Kingdom and Ireland, the SIGN (Scottish Intercollegiate Guidelines Network) criteria for tonsillectomy in recurrent tonsillitis are followed⁵ and these are based on the criteria set by Paradise et al. in 1984⁶.

Historically most patients had a tonsillectomy performed for recurrent tonsillitis; however, over the last 20 years, the predominant indication has changed to obstructive sleep apnoea⁷.

Paediatric patients with obstructive sleep apnoea are traditionally not considered suitable for day case surgery due to the post-operative anaesthetic risks. Indeed, based on the severity of OSA, some patients may require post-operative observation in a High Dependency Unit due to the risk of respiratory complications⁸. Therefore, few studies exist that describe day-case tonsillectomy in this cohort of patients. There is, however, increasing evidence that ambulatory surgery may be considered in patients with OSA without any other medical comorbidities^{9 10}. This has not been brought into everyday practice and remains an area of debate.

The majority of healthy children will recover better in their own home following surgery. Still, patients must be carefully selected to prevent post-operative readmissions and to provide optimal patient care.

The most common post-tonsillectomy complication is pain, and virtually all patients experience it. Poorly managed analgesia may lead to decreased oral intake, dehydration and the need for admission for rehydration and pain management. This can usually be avoided by providing appropriate analgesia information and aftercare¹¹.

Post tonsillectomy haemorrhage is classified as primary or secondary. Primary bleeds occur within the first 24 hours following surgery. The accepted incidence of primary bleeding is 0.5- 1%¹²¹³. Secondary haemorrhage occurs following the first 24 hours after surgery, and typically occurs between post-operative day 5- 10, and reported rates vary between 5-15%¹⁴. For successful day case surgery, primary haemorrhage rates must be low, and parents must be counselled on the possibility of this occurring and the need to return to the hospital.

A tonsillectomy is one of the most common procedures performed in any health care unit, and so reducing the overnight admission rate will be associated with a considerable cost reduction. The cost of an overnight bed in our tertiary care paediatric hospital is €1,800 per night and the cost of a day ward bed is €662. Therefore this would be related to a potential decrease in the cost of approximately 63%.

Methods

The institutional ethics committee granted ethical approval. We carried out a retrospective chart review of all-day case paediatric tonsillectomies carried out between August 2018- August 2020. Patients were identified by examination of theatre lists—all patients who were booked as day-case tonsillectomy were included. Data was collected through chart review. Statistical analysis was performed using Stata 15.1.

Patients were required to meet a list of criteria for day-case tonsillectomy, which was discussed with their parents at their outpatient visit. In some cases, where long waiters were identified from their clinical notes as being suitable for day-case tonsillectomy, parents were contacted over the phone and offered surgery as a day case. This was again discussed with the parents on the morning of surgery to confirm that the child was suitable and that their parents were happy to proceed.

Day Case Tonsillectomy Criteria
Age > 5 years
Weight >15kg
No history of obstructive sleep apnoea
No medical comorbidities (except well-controlled asthma)
The patient must live within 30 mins of the hospital
Two adults must be in the house on the first night of surgery (if other children at home)
Parents must be happy to give post-operative analgesia

The patients spent a minimum of 6 hours post extubation on the ward prior to discharge, to ensure adequate pain control, oral intake and observation post anaesthesia. They were reviewed by the ENT Consultant or Registrar prior to discharge. Parents were given contact details of the ENT department and advised to return to ED if any signs of bleeding. Discharge prescription was provided, which included paracetamol and ibuprofen. Antibiotics were not given as standard post operatively. Parents were advised to attend Temple Street Emergency Department if they had any evidence of bleeding. On review in the ED, the ENT registrar on call was contacted directly to review the patient.

Before August 2018, in our institution, tonsillectomy required an overnight admission. The ENT department identified this as an area of potential service improvement. An implementation plan was drawn up between ENT, the surgical day ward, the anaesthetic team and the pain team to identify an optimised care pathway for patients. The stakeholders drew up an agreed list of criteria, which were based on UK experience as well as local knowledge of our patient cohort. Initially, a pilot study was performed, and the practice was then fully implemented.

Patient charts were reviewed two weeks after their surgery. The data collected included surgical technique used, length of hospital stay, failed same-day discharge and the reason for admission, post-operative bleeding, and whether this required theatre for haemorrhage arrest.

Results

Between August 2018 and August 2020 there were 115 tonsillectomies performed as a day case.

Demographics

The average age was 9 years +/- 3.4 years, range 5-18. Male to female ratio was 1.1: 1.

Surgical Technique

Surgical technique was based on the surgeons' preference. Coblation tonsillectomy was performed in 60 patients (52.2%), and cold steel dissection with bipolar haemostasis performed in 55 (47.8%).

Failed Discharges

In total, there were five overnight admissions on the day of surgery (4.3%). Two of these were due to inadequate oral intake and one due to post-operative pain. One child was admitted post-operatively due to anaesthetic concerns regarding possible obstructive sleep apnoea. One child was discharged home but readmitted later that evening due to bleeding. All five children were discharged home on the first post-operative day.

Post Tonsillectomy Haemorrhage Rate

There was one primary haemorrhage within 24 hours of surgery (0.08%). There were 16 secondary bleeds, giving a rate of 13.9%. Of these, four patients required a return to theatre for the cessation of bleeding (3.5%).

Surgical Technique and Haemorrhage/ Admission Rate

The rate of post-tonsillectomy haemorrhage in the coblation group was 15%, and 14.2% in the cold steel/ bipolar group. There was no statistical significance between the different surgical techniques $\chi^2 (1, n= 115)=0.0047, p= .945$.

Of the coblation group, one patient required a return to theatre (1.6%) compared to 3 of the cold steel/ bipolar group (5.4%). This difference did not reach statistical significance $\chi^2 (1, n=17)=1.6392$, $p= .2$.

Of note, all of the children who failed to be discharged home on the day of surgery due to pain or inadequate oral intake (n=3) had surgery performed with cold steel dissection. There was no day of surgery admissions in the coblation group.

Financial Impact

Of 115 patients included in this programme, 111 (95%) were discharged on the day of surgery. Based on the cost of a day case bed compared to an overnight stay, this initiative has results in a cost saving of €126,318 for the hospital.

Discussion

These results demonstrate a low rate of failed discharges and the successful implementation of day-case surgery.

The overall rate of bleeding post-operatively is at the upper limit of quoted ranges. There are several possible explanations for this. All children were required to live within 30 minutes of the hospital to be suitable for surgery, and therefore all bleeds would represent directly to our unit, which would provide us with an accurate reflection of our bleed rate. It is the policy of our department to carefully counsel parents to return if there is any bleeding and to admit the child for observation. This may result in an overall higher quoted bleeding rate, relative to the rate of return to theatre due to bleeding.

These results demonstrate a successful post-operative pain management protocol as there were a low failed discharge rate and no readmissions for post-operative pain or inadequate oral intake. This would indicate that pain is well managed intraoperatively and post-operatively, and discharge prescriptions are adequate.

The surgical technique did not appear to impact bleeding rates and demonstrates a similar bleeding rate, with cold steel dissection/ bipolar having a slightly higher but not significant return to theatre rate. All of the patients who failed to be discharged home due to inadequate oral intake or pain control had cold steel tonsillectomy performed. This may suggest that early post-operative pain management is essential in this group going forward.

Comparison of overnight and day case bed costs is a crude measure of the financial impact but does indicate a significant saving. It also allows overnight beds in the hospital to be used for other patients which are not suitable for ambulatory surgery or for emergency department patients, therefore having a knock-on positive effect to other areas of the hospital.

This study demonstrates the first successful implementation of day-case tonsillectomy in Ireland, and an audit of our results. These figures suggest that day-case tonsillectomy can be implemented successfully, but does require a multidisciplinary approach from nursing, anaesthesia and the ENT department. In the context of an overstretched public health service, where bed shortages are common, and waiting lists are long, ambulatory surgery is a practical solution. We suggest that careful patient selection, appropriate infrastructure and clear post-operative instructions are necessary to implement this successfully. Multidisciplinary collaboration from anaesthesia, ENT and nursing was essential in establishing this process in our unit.

Declaration of Conflicts of Interest:

None to declare.

Corresponding Author:

Isobel O’Riordan

Children’s Health Ireland at Temple Street,

Dublin 1.

E-Mail: oriordai@tcd.ie

References:

1. RCSI.com. 2022. [online] Available at: <<https://www.rcsi.com/surgery/-/media/feature/media/download-document/surgery/practice/publications-and-guidelines/models-of-care/model-of-care-for-otolaryngology-head-and-neck-surgery.pdf>> [Accessed 27 March 2021].
2. Tewary AK. Day-case tonsillectomy: a review of the literature. *The Journal of Laryngology and Otology*. 2020;107:703–5.
3. Kharytaniuk N, Ali R, Sharafa A, Keogh IJ. Day-case tonsillectomy: Practical solution or practical impossibility. *Irish Medical Journal*. 2015 Jan 1;108(1).
4. Kanerva M, Tarkkila P, Pitkäranta A. Day-case tonsillectomy in children: Parental attitudes and consultation rates. *International Journal of Pediatric Otorhinolaryngology*. 2003 Jul 1;67(7):777–84.
5. Intercollegiate Guidelines Network S. Scottish Intercollegiate Guidelines Network Part of NHS Quality Improvement Scotland SIGN Management of sore throat and indications for tonsillectomy. 2010.
6. Paradise JL, Bluestone CD, Bachman RZ, Colborn DK, Bernard BS, Taylor FH, et al. Efficacy of Tonsillectomy for Recurrent Throat Infection in Severely Affected Children: Results of Parallel Randomized and Nonrandomized Clinical Trials. *New England Journal of Medicine*. 1984 Mar 15;310(11):674–83.
7. Patel HH, Straight CE, Lehman EB, Tanner M, Carr MM. Indications for tonsillectomy: A 10 year retrospective review. *International Journal of Pediatric Otorhinolaryngology*. 2014 Dec 1;78(12):2151–5.

8. Chu Qin P, Yi Rong Leonora L, Pei Yuan F, Kay Yee Winnie F, Kun Kiaang Henry T. Is Post-Operative High Dependency Admission Required for Children with Obstructive Sleep Apnea after Adenotonsillectomy? *Journal of Sleep Disorders and Management*. 2019 Apr 29;5(1).
9. Youshani AS, Thomas L, Sharma RK. Day case tonsillectomy for the treatment of obstructive sleep apnoea syndrome in children: Alder Hey experience. *International Journal of Pediatric Otorhinolaryngology*. 2011 Feb;75(2):207–10.
10. Wijayasingam G, Deutsch · Peter, Jindal · Mudith. Day case adenotonsillectomy for paediatric obstructive sleep apnoea: a review of the evidence. *European Archives of Oto-Rhino-Laryngology*. 2018;275(3):2203–8.
11. Mitchell RB, Archer SM, Ishman SL, Rosenfeld RM, Coles S, Finestone SA, et al. Clinical Practice Guideline: Tonsillectomy in Children (Update)—Executive Summary. *Otolaryngology - Head and Neck Surgery (United States)*. 2019 Feb 1;160(2):187–205.
12. Ikoma R, Sakane S, Niwa K, Kanetaka S, Kawano T, Oridate N. Risk factors for post-tonsillectomy hemorrhage. *Auris Nasus Larynx*. 2014;41(4):376–9.
13. Achar P, Sharma RK, De S, Donne AJ. Does primary indication for tonsillectomy influence post-tonsillectomy haemorrhage rates in children? *International Journal of Pediatric Otorhinolaryngology*. 2015 Feb 1;79(2):246–50.
14. Harju T, Numminen J. Risk factors for secondary post-tonsillectomy haemorrhage following tonsillectomy with bipolar scissors: Four-year retrospective cohort study. *Journal of Laryngology and Otology*. 2017 Feb 1;131(2):155–61.