Day Case Tonsillectomy—The Campbellton Experience

ABSTRACT

Tonsillectomy is a routine surgery performed in Campbellton Regional Hospital. Before January 2012 all the tonsillectomies were one day procedure. Due to reduction in the hospital beds, there was a significant pressure on the ENT service to perform more of tonsillectomies as day case procedures.

A Prospective and retrospective study was done for the day case tonsillectomies from January 2012 till June 2013 and results are reported.

KEYWORDS: DCT (day-case-tonsillectomy), post-tonsillectomy hemorrhage (PTH), post-tonsillectomy pain (PTP), Post-operative nausea and vomiting (PONV), ASA (American Society of Anesthesiologist) grading of patients, PACU (Post-anesthesia care Unit)

INTRODUCTION

Geographical Background

Demographically Campbellton is situated in the eastern part of province of New Brunswick, Canada bordering Quebec. Campbellton Regional Hospital caters patients from Belledune to St Quentin stretching about 180kms and spillover from bordering Quebec with a population of 15,000. About 20% of population falls into the group between 4 to 40 years of age. Around eighty cases of tonsillectomies are performed annually and out of which about 80% are done as a day case.

OBJECTIVE

To study the degree of safety in day case tonsillectomy by comparing post tonsillectomy pain, vomiting, hemorrhage in a day case tonsillectomy with one day procedure. Also to compare the results of day case tonsillectomy with
national and international data and adopt a safe anesthetic and surgical technique with smooth post-operative management.

**METHOD**

*Patients and material*

The patients are selected according to the guidelines that fall into the criteria’s (Table 2). Those patients who fall into the criteria have undergone tonsillectomy with or without adenoidectomy. An informed consent (Table 1) is obtained if the patient is below sixteen from the patient’s legal parents and if the patient is above sixteen, from the patients themselves. The study was reported in details and results are compared to the DCT published in the other literature.

The patient who were included in the study are marked in the database chart (Table 3). Each patients age, sex, type of surgery, anesthesia, medication, PTP (Table 4), PONV (Table 5) and PTH (Table 6) is recorded and appropriate grades are given according to the merit. Clinical management was scored as described (Table 7).

**Operative technique**

Historically, tonsillectomy has been performed on an ambulatory basis since around 40AD. Cornelius Celsus of Rome described the blunt removal of the tonsils using the index finger. Digital extraction was frequently in the early 20th century with or without gloves or fingerstall. A few were performed under local anesthesia or under chloroform but predominantly as an ambulatory procedure. Taptas (Constantinople-1913) performed blunt digital enucleation of the tonsils without anesthesia with patient in a sitting position.

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<th>Table 1: Informed Consent</th>
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<tr>
<td><strong>Tonsillectomy &amp; Adenoidectomy</strong></td>
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<tr>
<td>1. This procedure is performed under general anesthesia which takes about 15 to 30 minutes and in some extreme cases 1 hour.</td>
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<td>2. All the general anesthesia risks are involved.</td>
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<td>3. 2 to 5 % of cases can hemorrhage.</td>
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<td>4. Patients who hemorrhage more than 10% of blood volume sometimes need replacement of blood; others get better with conservative treatment.</td>
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<td>5. In some severe cases of hemorrhage, they may need examination under anesthesia to control bleeding and may need postnasal pack.</td>
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<td>6. Patients should take care of themselves by avoiding smoking, exposure to hot or polluted atmosphere and hot &amp; Spicy foods.</td>
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<td>7. Patient may have nasal regurgitation of food, but should recover from it in a week or two.</td>
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<td>8. Patients should attend clinic for follow-up after a period of 10 days and should take prescribed medication regularly.</td>
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<td>9. Sometimes patient remains febrile for 5-7 days after surgery.</td>
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<td>10. Painful swallowing (odynophagia) will be evident for 5 to 7 days.</td>
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chair, he designed for this pur-
pose. Since then various meth-
ods have evolved. Guillotine was
performed in the early century
and then modified into dissection
method. For the past ten years
coblation, unipolar and bipolar
cautery dissection methods are
used. In a few centers, laser and
microdebriders are used.

The dissection method was
used to perform all tonsillecto-
mies in the study. Under general
anesthesia, the patients head was
extended by placing a roll under
the shoulder with head resting on
a head ring. The head was draped
exposing the oral cavity and a
Boyle Davis gag was used to keep
mouth open and Draffin rods were
used to keep Boyle Davis gag in
place. Wet and dry 4x4 swabs were
placed around the endotracheal
tube to prevent the blood dripping.
Before the surgery Marcaine, was
injected 0.25% 5ml each side for
the patients below 16years of age
and above 16 years of age 0.50%
Marcaine 5ml was injected around
tonsils on the soft palate on each

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<th>Table 2: Criteria for Day Case Tonsillectomy</th>
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<td>1. The patient should be above 4 years.</td>
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<td>2. There should not be history of bleeding tendency with patient and his or her family. If there is positive history, blood coagulation profile should be within normal limits.</td>
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<tr>
<td>3. The patient should not have medical problems like upper respiratory tract infection, asthma, sleep-apnoea, and liver and kidney diseases.</td>
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<tr>
<td>4. The patient should be reachable to the hospital within 30 minutes. At least one of the parents should have vehicle to bring if the patient is a child.</td>
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<td>5. The parents should accept if the patient is child and in the adult patient should accept.</td>
</tr>
<tr>
<td>6. The parents in the case of patient is a child and the patient if she or he is an adult should be aware of the seriousness of post-operative care at home.</td>
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<tr>
<td>7. The patient should not be vomiting, able to eat and drink. Vital signs should be stable and there should not be any sign of bleeding during the stay in the DAY SURGERY.</td>
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<thead>
<tr>
<th>Patient Name</th>
<th>CPI</th>
<th>Date of Surgery</th>
<th>Age</th>
<th>Sex</th>
<th>Surgery Performed</th>
<th>Medication</th>
<th>Pain 0 TO 3</th>
<th>Vomiting</th>
<th>Bleeding</th>
<th>Outcome</th>
</tr>
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Pain Scale 0=No pain; 1=Mild pain; 2=Moderate pain; 3=Severe pain
side which helps to get a good dissecting planes as well as local anesthesia. Bipolar cautery to mark the incision on the anterior pillar to reduce mucosal ooze and the sharp end of dissector used to start dissection till capsule is seen. 2x2 small swab radio opaque marked with strings is used during dissection so the bleeding is minimized (Figure 1). Blunt end of dissector is used to complete dissection from the tonsillar bed. Oozing and bleeding is controlled using bipolar cautery and small swab (radio labeled) till the pedicle is reached. The pedicle is cauterized, crushed and snared. If bleeding is not controlled with bipolar cautery, number 0 silk or linen ligature is used. Complete hemostasis is achieved.

If adenoidectomy is done along with tonsillectomy, adenoid curette is used to curette the adenoid tissue and after the adenoid bed is packed with large swab (4x4 radio labeled) for ten to fifteen minutes. Adenoid bed is cauterized using bipolar cautery under direct visualization. Saline irrigation is done to clear the clots and blood, after the suction with malleable catheter three drops of otrivin 0.05% is instilled at the end of procedure.

Smooth induction and recovery is key, to avoid the complications. Careful gentle suction under vision is done by the anesthesiologist to avoid laryngoo and broncho-spasm. If these occur, the patients are managed in the operating room before the transfer to the recovery room.

The patients are shifted to the recovery (PACU) and are managed by the experienced and efficient nurses where vital signs and sign of bleeding are observed. Once the

<table>
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<th>Table 4: Pain Verbal Rating Scale</th>
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<tr>
<td><strong>Pain Intensity</strong></td>
</tr>
<tr>
<td>No pain</td>
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<tr>
<td>Mild pain</td>
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<tr>
<td>Moderate pain</td>
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<tr>
<td>Severe pain</td>
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<td>Excruciating pain</td>
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<th>Table 5: Nausea and Vomiting Scale</th>
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<td><strong>Nausea vomiting degree</strong></td>
</tr>
<tr>
<td>No any complaint</td>
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<tr>
<td>Mild degree complaint</td>
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<tr>
<td>Moderate degree nausea and vomit</td>
</tr>
<tr>
<td>Frequently vomit</td>
</tr>
<tr>
<td>Severely (continuously) vomit</td>
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<th>Table 6: Postoperative Bleeding Score</th>
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<tr>
<td><strong>Clinical attitude</strong></td>
</tr>
<tr>
<td>No Bleeding</td>
</tr>
<tr>
<td>Bleeding as usual</td>
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<tr>
<td>Bleeding more than usual</td>
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<tr>
<td>Profuse</td>
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<tr>
<td>Excessive</td>
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<td>Excessive and continuously</td>
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Figure 1: Showing Tonsillectomy Using Routine Dissection Method

- Tongue depressor
- Forceps
- Tonsil
- Tonsil Dissector
- Gauze in place in tonsillar fossa
- Gauze inserted between tonsil and tonsillar fossa
patients are stable, then they are moved to the Day surgery bed for a total of six hours post-operative period and are discharged if the patient’s condition is stable and are not vomiting and are able to drink and eat. All the patients are seen by the surgeon and postoperative instructions sheets (Table 8) are given with postoperative follow up appointments.

Standard Post-operative Anesthesia protocol for DCT is used which is as follows.

**Ketamine** is used as an adjunct during the induction of anesthesia, sedation and analgesia, decreases opioid analgesic requirements during perioperative period. Mechanism of action is Limbic system activation, producing dissociative anesthetic state. Dosage: 75-150 mcg/kg for adjuvant use. Adverse reaction are emergence delirium, sympathetic stimulation.\(^ {20}\)

**Propofol** is used for the induction of anesthesia. Mechanism of action is dose dependent cns depression due to increased GABA’ergic activity, resulting in sedation-hypnosis, amnesia. Dosage: 1.0-2.5 mg/kg IV for induction, 12.5-75 mcg/kg/min for sedation. Adverse reactions are

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**Table 7: Postoperative Haemorrhagic Scale**

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<thead>
<tr>
<th>Clinical attitude</th>
<th>Importance of haemorrhagic</th>
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<tbody>
<tr>
<td>No medical attention was required</td>
<td>Insignificant</td>
</tr>
<tr>
<td>Medical attention was required &amp; IV fluid or suction of the clot was initiated</td>
<td>Minor</td>
</tr>
<tr>
<td>Electro-cautery, re-operation or blood transfusion was required</td>
<td>Major</td>
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**Table 8: POST TONSILLECTOMY INSTRUCTIONS on Discharge from the Hospital**

1. No Advil, Motrin, Ibuprofen, Aleve, Aspirin or Aspirin products for two weeks unless ordered by the physician.
2. No narcotic analgesic in paediatric age group.
3. The patient should remain quiet for five days after having his or her tonsils removed. (This does not mean in bed)
4. A quiet cool room is recommended. Change of climate to be avoided and the patient should not be exposed to the hot environment.
5. The patient should limit talking.
6. A whitish scab like membrane (slough) will form on tonsillectomy site and is usually accompanied with pain or earache for 24-72hrs. Also can have minimal bleeding which may last for 15 minutes. If it is heavy and does not stop, should attend E.R.
7. The patient may run temperature of 37.5° C which is normal. If the patient has more temperature should attend ER.
8. The patient will be given prescription for pain; usually Tylenol if pain is severe in adult Tab Tramacet is given.
9. The patients are advised to drink fluids which are not red or pink so blood stains in the saliva could be detected. Avoid citrus fruit juices such as lemon and orange and hot and highly seasoned and hard food for the first week. The patients are encouraged to have soft diet. More they eat, faster will be the healing.
10. If there is small amount of bleeding it is controlled with ice collar to the neck. If persist for longer period need to attend ER.
11. Normally in children ten days and for the adults two weeks are given off sick from the day of surgery.
12. Bubble gum chewing is encouraged as it is helping to heal faster by dissolving slough by keeping the pharyngeal muscles active.
13. The patients are advised to avoid smoking for the period of two weeks and not to go where there is smoking.
14. The patients are told to avoid hot shower and aggressive exercise for the period of two weeks.
allergic reactions, anaphylaxis, pro-
convulsant activity.\textsuperscript{20}

**Morphine** is used for acute perioperative pain. Mechanism of action is opioid agonist, interacts with mu, kappa, delta and sigma opioid receptors, leading to analgesia, drowsiness. Dosage: 1-3 mg (IV), 2.5-10 mg (IM), 0.01-0.04 mg/kg/hr (infusion). Adverse reactions are usually dose dependent, non-mu receptor effects.\textsuperscript{20} (nausea, pruritus, paralytic ileus, urinary retention, apnea, truncal rigidity)

**Fentanyl** is used as an adjunct during induction and maintenance of postoperative anesthesia. Mechanism of action is opioid agonist, mainly interacts with cns mu receptors. Dosage: 2-75 mcg/kg IV for adjuvant use. Adverse reactions are same as morphine.\textsuperscript{20}

**Midazolam** is used as a preoperative medication for ‘conscious sedation’. Mechanism of action: Increases GABA-mediated central neural inhibition leading to sedation-hypnosis, anxiolysis, amnesia. Dosage: 1-3 mg IV bolus (premedication), 0.5-1 mg/kg PO (children). Adverse actions are impaired cognitive function, decreased motor coordination, enhanced respiratory depression when used with anesthetics or opioids.\textsuperscript{19}

**Ondansetron** is used for postoperative nausea and vomiting. Mechanism of action is selective 5-HT3 receptor antagonism. Dosage: 4-8 mg (IV) or 8-16 mg (PO) for PONV, 50-100 mcg/kg for children. Adverse reactions are extrapyramidal symptoms, elevated LFTs, prolonged Q-T interval, headaches, dizziness.\textsuperscript{19}

We have a group of Anesthesiologists in CRH who are actively involved as Anesthesia providers for all tonsillectomy cases. One surgeon (main author) was performing all the cases and he is on the board and actively involved in this project. Anaesthetic technique for these cases are comparable to evidence based approach and were in line with local practice in our region. All of our patients were graded according to ASA guidelines 1 & 2.

On a given operation day there were a maximum of two patients DCT and usually these were the first cases of the day. Criteria for the day case tonsillectomy is used to decide eligibility of DCT. None of the patient has received premedication.

If the patient had an intravenous line he or she received fentanyl/propofol/ketamine induction with or without muscle relaxation. If there was no intravenous line, oxygen, nitrous oxide/air and sevoflurane was given for inhalation induction. Intravenous access was then obtained after induction and maintenance of anesthesia was done with oxygen, air and sevoflurane/ desflurane as per discretion of the anesthesiologist. PONV prophylaxis was given to all the patients. A single dose of dexamethasone or double regimen
with dexamethasone and ondansetron was given as per discretion of Anesthesiologist. All patients under the age of 15 were given tylenol suppository either immediately after induction or at the end of surgery.

All patients were intubated with an endotracheal tube and were extubated at the end of surgery in the OR, transported to PACU for observation. There was no change in the management in PACU. Once the criteria on discharge were met, patient was transferred to day surgery ambulatory unit, and observed until discharge.

At each step, surgeon was actively involved in the clinical assessment of the patient, especially post-operative bleeding, and Anesthesiologists were involved in the pain and PONV management.

Another dose of dexamethasone as per body weight was ordered by the surgeon within 6hrs post-surgery before discharge if there is swelling of tongue or uvula. Antibiotics are prescribed for all the patients.

RESULTS
The patient who were booked as a DCT and were admitted because of vomiting or haemorrhage on the same day were not included in this study. Two cases did not come for follow up and were excluded from this study. The number of patients

![Day Case Tonsillectomy Volume Graph](chart.png)
were on the peak during Nov 2012 and Feb 2013 as the surgeon (Principal investigator) was on leave for a period of four weeks from late Dec 2012 to early Jan 2013.

Total number of patients were 76. Graph 1 showing DCT by month.

The number of DCT vs admitted tonsillectomy in Campbellton Regional Hospital by month were shown in. Graph 2

Tonsillectomy alone were 22 and Tonsillectomy with adenoidectomy +/- myringotomy were 54.

The age of majority of cases was between 3-17 years, 59 out of 76 and are shown according to the age by month in Graph 3.

The majority of cases were female, .51 out of 76 are shown in Graph 4 by month.

The number of cases admitted were seven, two were with PONV on 4th post operative day, four with PTP after 5 days till 8th day, One with PTH on 6th post-operative day and managed conservatively.

PTP is scored according to a different post-operative period. Graph 5.

Visit to ER were 15/76 and out of which only 7 cases were admitted. DCT with their visit in each month and admission is plotted in the Graph 6.

**DISCUSSION**

All Tonsillectomies were admitted in the past. Since last twenty
years various studies of day case tonsillectomies were published as a safe procedure.\textsuperscript{4,5} Proper selection of patients, safety measures and patients acceptance are important factors in dealing DCT.\textsuperscript{6} There are few contraindications for DCT which are mentioned as below.\textsuperscript{7}

1. age >65yrs
2. Bleeding problems or on blood thinners.
5. NSAID sensitivity patients
6. Patients on MAO inhibitors
7. Diabetic patients
8. Sickle cell disease
9. Social reasons, No car available. No adult available to take care of kid.

Post tonsillectomy hemorrhage incidence varies from 1.95\% to 2.4\% in a large series. There is increase in the incidence in 4th decades and more in the females.\textsuperscript{8}

Severe pain during swallowing impairs intake of fluids during recovery and is associated with increased risk of secondary hemorrhages and PONV.\textsuperscript{12}

Postoperative nausea and vomiting (PONV) is defined as any nausea, retching, or vomiting occurring
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during the first 24–48 h after surgery in inpatients. PONV is one of the most common causes of patient dissatisfaction after anesthesia, with reported incidences of 30% in all post-surgical patients. Inhalation anesthetics are associated with two-fold increase in PONV. In addition, PONV is regularly rated in preoperative surveys, as the anesthesia outcome the patient would most like to avoid. While the incidence of PONV is low, nausea and vomiting is still an unpleasant and all-too-common postoperative morbidity that can delay patient discharge from the post-anaesthesia care unit and increase unanticipated hospital admissions in outpatients.

Opioids induce vomiting; swallowed blood and oropharyngeal irritation also induce vomiting. No PONV occurred in one of the series. Dexamethasone is used preoperatively or intraoperative help to reduce PONV and PTP. The exact mechanism is not known 1) via prostaglandin antagonism, 2) the release of endorphins resulting mood elevation and sense of well-being and appetite stimulation, 3) reducing the level of 5-hydroxy tryptophan in the neural tissue by depleting the precursor try-

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<td>7</td>
<td>4</td>
<td>2</td>
<td>76</td>
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Day Case Tonsillectomy by Gender

Graph - 4

Jan 1, 2012 to Jun 30, 2013
tophan. 4) potentiating the main effect of anti-emetic by sensitizing the pharmacological receptors. Combination of dexamethasone with 5- Ht receptor antagonist is good to control PONV.\(^3\) Metaclopropamide can be used to prevent the PONV; it acts on central dopaminergic receptors and peripheral 5-HT receptors. However the dose responsiveness is not established. In the adult 5-30mg and in the children 0.10-0.50mg/kg was used. Adverse effect like extrapyramidal symptoms, sedation, drowsiness, dizziness, vertigo and headache are reported.\(^2\) As previously mentioned, antiemetic drugs like ondansetron, dexamethasone, and droperidol are similarly effective, each reducing the patient’s risk by 25%. Because they work on different receptor classes, their effects are additive.\(^24\)

Practitioners should systematically implement prophylactic and therapeutic antiemetic strategies based on randomized controlled trials, meta-analyses, and evidence-based consensus guidelines to reduce the institutional rate of PONV. Assessing and informing the patient of his/her baseline risk, providing adequate prophylactic...
laxis, and treating established PONV with rescue antiemetics of a different class are the foundations of successful management of this distressing postoperative outcome.24

Preoperative 8mg lornoxicam is more effective than 50mg Tramadol with early postoperative tonsillectomy pain in adult patients with similar side effects like nausea and vomiting. Lornoxicam is not available in Canada. Intra and postoperative pain is managed by standard opioids as per Anesthesiologists preference is usually morphine and/or fentanyl are given.

NSAIDS have analgesic effect that has been attributed to their peripheral anti-inflammatory actions in inhibiting synthesis of prostaglandin through inactivation of cyclooxygenase. This peripheral action of NSAIDS can indirectly inhibit central neural sensitization and consequently reduce the amplification of pain. Recent research has shown preemptive analgesia by administering NSAID’s to be effective. The most important caution in using NSAIDS is postoperative bleeding seen with higher dosages caused by inhibiting cyclooxygenase thus
inhibiting thrombocyte aggregation. Further study is required to show the safety of NSAID in the patients where blood loss poses special risk as seen in patients with hemorrhagic disease.1 Local anesthetics provide additional post-operative analgesia.15 Intravenous paracetamol (prefelgan) is highly effective in pain treatment in the adults after tonsillectomy.17 Prefelgan is only recently approved in US and not yet available in Canada. In children below 15 years of age Tylenol suppositories 10-20mg/kg are inserted and above 15 yrs of age naproxen (NSAID) suppositories 500mg are inserted during induction. Multimodal therapy is given to get maximum with minimum side effect.

Post-operative antibiotics group after DCT returned to normal oral intake earlier compared to those patients who had no antibiotics.11 Intravenous cefazoline is given routinely one stat dose and then orally clavulin for seven days, if there is history of allergy to cephalosporin clindamycin is administered.

CONCLUSION

CLINICAL PEARLS

Tonsillectomies are routine procedures. Though routine procedures complications and deaths are reported, proper selection of patients for DCT is important factor. There are few contraindications for DCT7. Safety guideline is key to prevent complications. Intra and Post-operative Anesthesia protocol could help for smoother and quicker recovery.
Tonsillectomy can be safely done as a day case as there is no significant difference of PTH, PTP and PONV between day case and one day admission provided proper selection of patient, surgical technique and nursing care is done.

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Competing interest none declared.

REFERENCES