Coblation versus other Surgical Tonsillectomy Techniques

Candida Hoggarth-Baldwin BSM, BSN, RN, FNP-s

Jamestown, ND

University of Mary

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Evidence Based Clinical Appraisal Summary: 
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Scenario:
A 12 year-old female is seen in the clinic for sore throat. Patient has a history of recurrent tonsillitis, last episode 2 months ago. During this episode, patient’s primary care provider visited with family and provided a referral for surgical Tonsillectomy or Adenotonsillectomy (T and A). The patient’s physical exam reveals bilateral 4+ large round red cryptic tonsils, with small amount of white exudate, and 1-2 bilateral cervical node enlargements without tenderness. Rapid strep culture negative. Patient’s examination is consistent with acute tonsillitis, patient’s fifth acute episode in a one-year timeframe. Patient had similar number of tonsillitis episodes for two-three years.

An inquisition was made about surgical consultation regarding T and A. Father stated that mother is looking into traditional dissection versus Coblation. The father inquires what T and A methods used in the area, have less associated pain and less recovery time. The T and A methods utilized in a 100-mile radius of Jamestown, ND, are Dissection and Snare, Laser, and Coblation.

Clinical Question:
In children (ages 2-18), undergoing T and A, is the Dissection and Snare method comparable to the Coblation method, when evaluating a patient’s postoperative pain level and recovery time?

Articles:

Critical Review of Study:
Howe, Unsworth, & Hilliam (2009) provided a Grade A, Level 1b evidence in a randomized, double-blinded, comparative trial of cold steel dissection instrument technique, and coblation technique effect, on postoperative pain level. Participants included children between 4 and 16 years scheduled to undergo tonsillectomy or adenotonsillectomy at Derby Children’s Hospital. Children already regularly receiving analgesic medications, and/or with a hx of therapy for bleeding, were excluded from participating in the study. In all, 70 children were included into the study. A computer randomly divided two groups: 35 into cold steel dissection instrument technique, and 35 into coblation technique. Induction, analgesia, and postoperative pain medications orders where prescribed based on individual patient weight’s. Nursing staff utilized the Derbyshire Pain chart (the routine pain assessment scale utilized at the Derbyshire Children’s Hospital) and the Wong and Baker Faces Scale to assess postoperative pain, and a review of postoperative analgesic administration was completed. In addition, a nurse completed an over-the-phone pain assessment, and data collection of analgesic administration, on day 1,3,6,8, and
10, postop. Altogether, data on postoperative pain scores, nutrition, and analgesia medication use, was collected.

Tvinnereim, Lie, & Saltyte (2007) provided a Grade A, Level 1b evidence in a randomized, single blind, controlled, comparative trial of dissection tonsillectomy technique, and coblation technique effect on postoperative pain level. Participants included children between 4 and 12 years, scheduled to undergo tonsillectomy in Norway at the Akershus University Teaching Hospital. Children excluded from participating in the study where individuals with: “a history of a bleeding disorder, asthma, other past medical history, a history of tonsillitis within three weeks prior to surgery, and contraindications for NSAIDs” (Tvinnereim, et al., 2007, p 262). In all a total of 40 children where included into the study. Two groups, each containing 20 patients that were randomly assigned to the groups, were formed. Induction, analgesia, and postoperative pain medications orders where prescribed based on individual patient weight’s. Postoperative discharge was identical for all participants, scheduled pain medication (five days), and as needed pain medications (five days). Daily, parents completed a questionnaire regarding patient’s postoperative recovery, including visual and grading (1-5) pain level. In addition, a nurse completed an over-the-phone questionnaire with the parents, at postoperative day 1, 3, 7, and 10. This data was then compared to the parent’s questionnaire reports. Altogether, data on operation time, intra-operative bleeding, postoperative pain, activity, nutrition, and analgesia medication use was collected.

Results:

In A randomized controlled trial to compare postoperative pain in children undergoing tonsillectomy, using cold steel dissection with bipolar haemostasis, versus coblation technique (2009), the quantified pain levels underwent chi-squared testing to determine the statistical significance. In addition, ANOCA test was utilized to confirm the validity of the results. The study results indicated that only on the sixth postoperative day posed a statistically significant difference in postoperative pain levels (dissection group had a p value of 0.036 for day 6 postop.). The two group’s use of analgesic medications, return to diet and fluid intake, or reported postoperative pain levels on day 1, 3, 8, and 10 had no statistically significant difference.

In A pilot randomized controlled trial of coblation tonsillectomy versus dissection tonsillectomy with bipolar diathermy haemostasis (2007), “the χ²-test with Yates’ correction and the Mann-Whitney U-test were performed to compare coblation tonsillectomy and dissection tonsillectomy” and “the groups were statistically comparable by age, weight, and operation type” (p 263). The results of this study “demonstrates significant improvement in the postoperative recovery profile in children undergoing sub capsular coblation tonsillectomy, when compared with children receiving dissection tonsillectomy” (p 264-265).

Strengths/Limitations:

Parker, et al. (2009) and Tvinnereim, et al. (2007) investigations, research, strengths, and limitations parallel each other. Two areas, identified as both a strength and limitation are 1: the specific population age, and 2: specific evaluation of two T and A methods. The age of the population studied is curtailed to the population that typically undergoes a T and A procedure (strength), but the studies on children require additional certification/approval, and findings don’t necessarily apply to adults (limitation). There are several methods that can be utilized to perform a T and A (i.e. Dissection and snare, Electocautery, Harmonic scalpel, Radiofrequency ablation,
Thermal Welding, Carbon dioxide laser, Microdebrider, and Radiofrequency Ablation (Coblation). A comprehensive evaluation of all methods would allow a provider to have a comprehensive review of data (strength), but the research data lacks significance (limitation). The limitations identified in the both studies include:

1) Sample sizes are limited/small (40 and 70 participants).
2) Questionnaire and telephone assessment methods can be time consuming.
3) Data was collected in a number of different geographical areas.
4) Cultural and ethnic differences limit the generalization of clinical findings (both studies took place outside of the United States: Derby, UK and Oslo, Norway; and don’t address culture and ethnic background).
5) Studies focus on pain assessment in young children. Pain is subjective, and assessment in young children can be difficult. Studies relied on parents to accurately assess and report child’s subjective pain level.

Both studies have the strength in using strong assessment and analysis methods. Each study utilized two pain assessment methods. These methods validated one another and were generally well studied, strong, and pediatric focused. The studies, in general, are specific, well conducted, and focused.

Implications for Clinical Practice:

Tonsillectomy is a common surgical procedure (Tvinnereim, et al., 2007). There are several techniques available to perform a tonsillectomy or adenotonsillectomy. Tvinnereim, et al. (2007) and Howe, et al. (2009) reported that the dissection and snare (or cold steel dissection) method is a surgical procedure where utilization of a forceps, scissors with a wire loop “snare”, and cauterization of remaining tissue is performed. Coblation (cold ablation) utilizes a plasma sodium ionized surgical method, resulting from using radiofrequency in a saline medium. Coblation is a non-reusable method, making it more costly.

Based on the surgical method utilized the postoperative side effects, patient outcomes, and pain varies. There is limited research focused on evaluation of dissection and coblation T and A methods. Tvinnereim, et al. (2007) and Howe, et al. (2009) performed nearly identical research focused on comparing the dissection and snare method to the coblation. Both utilize similar methods, population, sample size, level of research, and have focus on measuring postoperative pain levels. The findings of the two research articles contradict one another.

Given the data reviewed, this critical appraisal topic failed to provide clear evidence-based practice outcomes. The conclusion is that dissection or coblation tonsillectomy techniques have equal postoperative pain and have similar outcomes, but coblation generally costs more. Development of a method with minimal to no side effects, and optimal patient outcomes, continues to be a goal. Evaluation of the various tonsillectomy methods continues to be a valid research focus.