THE MODERN TONSILLECTOMY

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Grand Rounds Presentation
April 27, 2005
- History
- Indications
- Innovative Techniques and Comorbidites
  - Intracapsular tonsillectomy
  - Harmonic scalpel
  - Laser
  - Coblation
- Adjuvant Therapy
  - Local Anesthesia: Bupivacaine
  - Perioperative Dexamethasone
  - Postoperative Antibiotics
- Current Practice Patterns
History

- **Aulus Cornelius Celsus**
  - 1<sup>st</sup> Century AD
  - “the tonsils are loosened by scraping around them and then torn out” with a finger
  - Used vinegar and medication for postoperative hemostasis

- **Aetius of Amida**
  - 6<sup>th</sup> Century AD
  - Hook and knife method

- **Philip Syng Physick** (“Father of American surgery”)
  - First to develop the tonsillotome

- **Mackenzie**
  - Late 1800s
  - Made tonsillotome use common
History

- Partial versus complete tonsil removal
  - 1906 William Lincoln Ballenger recommended complete removal of tonsil with the capsule intact
  - 1909 George Ernest Waugh credited as first to describe complete tonsillectomy

- 1911-1917 Crowe reviewed 1000 tonsillectomies
  - Use of Crowe-Davis mouth gag
  - Sharp dissection
History

- In U.S.
  - 1959: 1.4 million tonsillectomies performed
  - 1979: 500,000
  - 1985: 340,000
  - 1996: 287,000

- In 1950s and 1960s chronic infection primary surgical indication

- Now, airway obstruction and obstructive sleep apnea more common indications
  - Improvement in medical management with Abx
Indications

- **AAO-HNS** published guidelines in *1995 Clinical Indicators Compendium*

- Tonsillar disease refractory to medical therapy

- 3/+ infections/year
- Hypertrophy
  - Dental malocclusion
  - Orofacial growth affected
  - Upper airway obstruction
  - Dysphagia
  - Sleep disorders
  - Cardiopulmonary complications
- Peritonsillar abscess
- Halitosis due to chronic tonsillitis
- Chronic/recurrent tonsillitis with Strep carrier state
- Unilateral hypertrophy, presumed neoplasm

Indications

- Paradise et al, 1984
  - Parallel randomized and non-randomized clinical trials to evaluate the efficacy of tonsillectomy in the pediatric population with recurrent pharyngitis
Criteria

- 7/+ episodes in last 1 year
- 5/+ episodes in last 2 years
- 3/+ episodes in last 3 years

Clinical features of each episode

- Fever
- Lymphadenopathy
- Tonsillar/pharyngeal exudate
- Positive β-hemolytic streptococcus test
- Medically treated
Paradise conclusions

- Tonsillectomy was efficacious for 2 years and possibly a third in reducing frequency and severity of subsequent episodes

Paradise criteria adopted by many otolaryngologists
Paradise et al, 2002

- 2 parallel randomized controlled trials to evaluate efficacy of tonsillectomy in moderately affected children
- Surgical criteria not as stringent as those in previous study

Results

- Incidence of subsequent pharyngitis in surgical groups significantly lower than control group for 3 years postoperatively
- However, overall incidence of recurrence was low

- Concluded that surgical criteria must remain stringent
Innovative Techniques

- Intracapsular Tonsillectomy
- Harmonic Scalpel
- Laser
- Coblation

Guiding Principle: reduce morbidity
- Hemorrhage
- Pain
- Diet
- Activity
- Cost
Intracapsular Tonsillectomy

Koltai et al, 2002

- Retrospective case series (312)
- Tonsillar hypertrophy causing sleep disordered breathing
  - Intracapsular tonsillectomy (150)
    - Microdebrider at 1500 rpm in oscillating mode
    - Hemostasis with suction cautery
  - Total tonsillectomy (162)
    - Subcapsular
<table>
<thead>
<tr>
<th>Group</th>
<th>EBL (mL)</th>
<th>Immediate Postop Hemorrhage</th>
<th>Delayed Postop Hemorrhage</th>
<th>Postop Dehydration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intracapsular</td>
<td>25</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Tonsillectomy</td>
<td>30</td>
<td>0</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>162</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statistically significant results
- Intracapsular group had lower pain scores at each postoperative time interval: POD 1-3, 4-6, 7-9, after 9
- Intracapsular group had earlier return to normal activity
- Intracapsular group had less analgesic use

Conclusions
- Tonsil capsule is not violated thereby avoiding pharyngeal muscle exposure to secretions, injury, and inflammation
- As a result, postoperative pain and recovery time reduced

Weaknesses
- Retrospective study: Recall bias
- Tonsillar regrowth
- Surgical experience
Complications of Intracapsular Tonsillectomy

- Sorin et al., 2004
  - Retrospective review with follow up (278)
  - 11 Complications (3.9%)
    - 9 with tonsillar regrowth with snoring
      - 2 required completion tonsillectomy
    - 1 with immediate self-limited bleeding
    - 1 with delayed bleeding
TABLE I.
Complications Following Powered Intracapsular Tonsillectomy and Adenoidectomy.

<table>
<thead>
<tr>
<th>Patient (N = 278)</th>
<th>Sex</th>
<th>Age (months)</th>
<th>Complication</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>27</td>
<td>Tonsil regrowth, snore</td>
<td>Observe</td>
</tr>
<tr>
<td>2</td>
<td>Male</td>
<td>32</td>
<td>Tonsil regrowth, snore, rOSA</td>
<td>Tonsillectomy</td>
</tr>
<tr>
<td>3</td>
<td>Male</td>
<td>40</td>
<td>Tonsil regrowth, snore</td>
<td>Observe</td>
</tr>
<tr>
<td>4</td>
<td>Female</td>
<td>42</td>
<td>Tonsil regrowth, snore</td>
<td>Observe</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>44</td>
<td>Tonsil regrowth, snore</td>
<td>Observe</td>
</tr>
<tr>
<td>6</td>
<td>Female</td>
<td>54</td>
<td>Tonsil regrowth, snore</td>
<td>Observe</td>
</tr>
<tr>
<td>7</td>
<td>Male</td>
<td>55</td>
<td>Immediate self-limit bleed</td>
<td>Observe</td>
</tr>
<tr>
<td>8</td>
<td>Female</td>
<td>58</td>
<td>Tonsil regrowth, snore</td>
<td>Observe</td>
</tr>
<tr>
<td>9</td>
<td>Female</td>
<td>60</td>
<td>Tonsil regrowth, snore</td>
<td>Observe</td>
</tr>
<tr>
<td>10</td>
<td>Female</td>
<td>60</td>
<td>Delayed bleed POD#5</td>
<td>Removed clot</td>
</tr>
<tr>
<td>11</td>
<td>Male</td>
<td>79</td>
<td>Tonsil regrowth, snore, rOSA, Strep.</td>
<td>Tonsillectomy</td>
</tr>
</tbody>
</table>

rOSA; return of obstructive sleep apnea; snore, return of snoring without OSA; Strep., Streptococcus-positive pharyngitis; POD#5; post-operative day 5.

Intracapsular Tonsillectomy in Children Under 3 Years

Bent et al., 2004
- Retrospective cohort study (226)
- 36 patients < 36 mo
- 186 patients > 36 mo

Conclusions

- Intracapsular tonsillectomy is safe and efficacious in children under 3 years for tonsillar hypertrophy and sleep disordered breathing without need for admission

Limitations

- Retrospective study
- Uneven distribution
- Long term results of tonsillar regrowth unknown
Harmonic Scalpel Tonsillectomy

- Ultrasonic dissector and coagulator
- Vibratory energy
  - Cutting: sharp blade with frequency of 55.5 kHz over distance of 80 μm
  - Coagulating: vibration breaks H-bonds, thermal energy
    - 50° – 100° C
    - Electrocautery 150° – 400° C
Willging et al., 2003

- Single-blind, randomized prospective study (117)
  - Harmonic scalpel versus electrocautery
- Indications: recurrent infection and hypertrophy with airway obstruction
- Outcomes measured: intraoperative bleeding, operative time, postoperative hemorrhage
- Questionnaire used for assessment of postop pain, ability to eat and drink, and level of activity
Operative time statistically significant
- Harmonic scalpel 8 min 42 sec
- Electrocautery 4 min 33 sec

No significant difference in intraoperative blood loss and postoperative ability to eat and drink

Level of activity for the first postop day significantly lower in harmonic scalpel group

Postoperative pain scores tended to be lower in harmonic scalpel group

Postoperative bleeding
- Harmonic scalpel: 6
- Electrocautery: 3
- Not statistically significant
Laser Tonsillectomy

Kothari et al, 2002

- Prospective double-blind randomized controlled trial (151)
  - Compare the use of KTP laser tonsillectomy versus cold dissection and snare
- KTP 532 laser at 10W, continuous beam
- Outcomes measured
  - Operative time
  - Operative bleeding
  - Postoperative pain
  - Postoperative advancement to diet
Results

- **Operative time:**
  - Laser 12 min
  - Dissection 10 min
  - Not statistically significant

- **Intraoperative blood loss**
  - Laser 20 mL
  - Dissection 95 mL
  - Statistically significant

- Laser group with higher postop pain scores
- Laser group with greater difficulty resuming postoperative diet
- Readmission for delayed hemorrhage was 8% in the laser group and 4% in the dissection group
  - Not statistically significant

<table>
<thead>
<tr>
<th></th>
<th>Day 0</th>
<th>Day 1</th>
<th>Day 28</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dissection</td>
<td>Laser</td>
<td>Dissection</td>
</tr>
<tr>
<td>No pain</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Slight pain</td>
<td>24</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td>Moderate pain</td>
<td>22</td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>Bad pain</td>
<td>18</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>Severe pain</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Blank</td>
<td>4</td>
<td>2</td>
<td>14</td>
</tr>
</tbody>
</table>

**Table 2.** Severity of pain as measured on a visual analogue score at 17.00 on the day of surgery, day 1 and day 28 after tonsillectomy.
Conclusion

- KTP laser provides little benefit over dissection tonsillectomy except to minimize intraoperative bleeding

Limitations

- Technical expertise
- Electrocautery not included
Coblation Tonsillectomy

- Bipolar radiofrequency energy transferred to sodium molecules to create an ion or plasma field
- This thin layer of plasma is utilized to ablate tissues at molecular level
- No need for electrocautery for hemostasis
- Temperature from 40° to 85° C
- Electrocautery at 20W: above 400° C
Coblation Tonsillectomy

- Chang et al, 2005
  - Prospective randomized double-blinded controlled study (101)
  - Compared intracapsular tonsillectomy using coblation versus traditional subcapsular tonsillectomy in children
    - OSA
    - Sleep disordered breathing
Coblation
- From surface out laterally
- Coblate 9 setting to ablate tissues
- Coblate 5 setting to coagulate
- Capsule not penetrated

Electrocautery
- Bovie set to 20 W

Outcomes measured
- Questionnaire
  - Pain
  - Analgesics
  - Nausea/vomiting
  - Diet
  - Activity
- Complications
**Fig 2.** Mean pain scores reported by children in the study. Error bars represent 1 SD from the mean. Statistical significance of $P < 0.005$ is represented by *double asterisks.*
**Fig 3.** Mean pain scores reported by parents in the study. Error bars represent 1 SD from the mean. Statistical significance of $P < 0.005$ is represented by double asterisks.

Fig 6. Mean percentage of normal diet taken by children in the study. Error bars represent 1 SD from the mean. Statistical significance of $P < 0.005$ is represented by double asterisks.

Fig 8. Mean percentage of normal activity demonstrated by children in the study. Error bars represent 1 SD from the mean. Statistical significance of $P < 0.005$ is represented by double asterisks.
Weaknesses

- Study compares intracapsular technique with subcapsular technique
  - Capsule and therefore underlying pharyngeal tissues not violated
- Does not account for possible long term possibility of tonsillar regrowth

- Similar study performed by Chan et al, 2004
- Stoker et al, 2004 performed similar study but used coblation for blunt dissection to perform total tonsillectomy
- Chan and Stoker had similar results in reduction of postoperative morbidity
Coblation Tonsillectomy

- Future considerations
  - To evaluate coblation for intracapsular tonsillectomy, a fair study would use another intracapsular technique such as power-assisted tonsillectomy with a microdebrider
Adjuvant Therapies

- Aims are to reduce comorbidities of tonsillectomy
  - Reduce pain
  - Reduce nausea
  - Resume diet
  - Resume activity
  - Reduce overall postoperative cost
- Local Anesthetic: Bupivacaine
- Steroids: Dexamethasone
- Postoperative Antibiotics
Local Anesthetic

- Tonsils innervated by:
  - Tonsillar branches of glossopharyngeal nerve
  - Palatine nerves of V2
  - Lingual branches of V3

- Bupivacaine: amide anesthetic
  - High lipid solubility and protein binding
  - Rapid onset with effect lasting 6-9 hours
Local Anesthetic

- Violaris and Tuffin, 1989
  - Prospective double-blind controlled trial to evaluate the application of topical bupivacaine versus saline following tonsillectomy in the same patient
  - The side treated with bupivacaine had higher pain scores than saline
Local Anesthetic

- Nordahl et al, 1999
  - Prospective double-blind randomized trial with three treatment arms, intraoperative injections
    - 42 with saline (9mg/ml)
    - 41 with saline (9mg/ml) and epinephrine (5μg/ml)
    - 43 with bupivacaine (2.5mg/ml) and epinephrine (5μg/ml)
    - Injections in tonsillar pillars and uvula
  - Postoperative pain scores recorded at varying intervals
  - Varying experience of otolaryngologist performing injection and tonsillectomy
Table II. Observed mean values of the pain scores (range 0—3, 0: no pain, 1: some pain, 2: extensive pain, 3: not able to eat or drink due to severe pain) at each day after operation by injected substance among patients with complete follow-up.

<table>
<thead>
<tr>
<th></th>
<th>No. of patients</th>
<th>Operation day</th>
<th>Postoperative days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>16.00 h</td>
<td>20.00 h</td>
</tr>
<tr>
<td>Pain when drinking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bupivacaine + epinephrine</td>
<td>37 (6)</td>
<td>2.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Epinephrine + saline</td>
<td>39 (2)</td>
<td>2.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Saline</td>
<td>41 (1)</td>
<td>2.9</td>
<td>2.2</td>
</tr>
<tr>
<td>No. of missing values</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Pain, eating soft food</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bupivacaine + epinephrine</td>
<td>36 (7)</td>
<td>2.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Epinephrine + saline</td>
<td>38 (3)</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Saline</td>
<td>40 (2)</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>No. of missing values</td>
<td></td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Pain, eating ordinary food</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bupivacaine + epinephrine</td>
<td>36 (7)</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Epinephrine + saline</td>
<td>38 (3)</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Saline</td>
<td>36 (6)</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>No. of missing values</td>
<td></td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

1 No. of patients with valid values for all repeated measures, and in the parentheses; no. of patients with missing value at one or more days.

Results

- Only statistically significant pain score was with swallowing (without food) in the bupivacaine and epi group
- Patients treated by experienced otolaryngologist in the bupivacaine and epi group had lowest pain scores
- Patients treated by less experienced otolaryngologists in the bupivacaine and epi group had highest pain scores
- No difference in analgesic consumption among groups

Limitations

- Technique not specified for tonsillectomy
- Number of patients treated by experienced or less experienced otolaryngologists not specified
Local Anesthetic

- Kountakis et al, 2002
  - Prospective randomized blinded and controlled study in adults (34)
  - 10 mL 0.5% bupivacaine vs 10 mL NS
  - Electrocautery tonsillectomy
  - Daily questionnaires for 10 days
    - Pain score
    - Analgesic required
    - Oral intake
- No significant difference in pain, analgesic use and oral intake among groups
- Bupivacaine group more comfortable in initial period following tonsillectomy
  - Significant variation in pain score when bupivacaine wore off
Intraoperative Steroids

- Systemic corticosteroids known for mood elevation, appetite stimulation, anti-inflammatory and antiemetic effect
  - Used during chemotherapy to treat nausea
  - Exact antiemetic mechanism unknown

- Dexamethasone
  - Half-Life 36 – 72 hours
  - Low cost $0.25/4mg
Intraoperative Dexamethasone

- Steward et al, 2001
  - Meta-analysis of 8 double-blinded randomized controlled trials using dexamethasone for children undergoing tonsillectomy
  - Outcomes measured
    - Postoperative emesis
    - Return to soft or solid diet
    - Postoperative pain
  - Single dose 0.15 – 1.0 mg/kg
  - Sensitivity analyses performed
TABLE III.
Meta-analysis Results Steroid vs. Placebo During Pediatric Tonsillectomy.

<table>
<thead>
<tr>
<th></th>
<th>Emesis—24 hr.</th>
<th>Day 1 Diet</th>
<th>Day 3 Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Steroid</td>
<td>Placebo</td>
<td>Steroid</td>
</tr>
<tr>
<td>Study</td>
<td>n/N</td>
<td>n/N</td>
<td>n/N</td>
</tr>
<tr>
<td>April</td>
<td>2/41</td>
<td>10/39</td>
<td>17/41</td>
</tr>
<tr>
<td>Catlin</td>
<td>3/10</td>
<td>7/15</td>
<td>6/34</td>
</tr>
<tr>
<td>Ohlms</td>
<td>2/34</td>
<td>3/35</td>
<td></td>
</tr>
<tr>
<td>Pappas</td>
<td>30/63</td>
<td>57/65</td>
<td></td>
</tr>
<tr>
<td>Splinter</td>
<td>25/63</td>
<td>50/70</td>
<td></td>
</tr>
<tr>
<td>Tom</td>
<td>1/26</td>
<td>15/32</td>
<td>19/26</td>
</tr>
<tr>
<td>Vosdoganis</td>
<td>10/22</td>
<td>10/19</td>
<td>22/22</td>
</tr>
<tr>
<td>Pooled</td>
<td>73/259 (29%)</td>
<td>152/275 (55%)</td>
<td>64/123 (52%)</td>
</tr>
<tr>
<td>RR (CI&lt;sub&gt;95&lt;/sub&gt;)</td>
<td>0.55 [0.41, 0.74]&lt;sup&gt;*&lt;/sup&gt;</td>
<td>1.69 [1.02, 2.79]&lt;sup&gt;*&lt;/sup&gt;</td>
<td>1.22 [0.81, 1.86]</td>
</tr>
<tr>
<td>RD (CI&lt;sub&gt;95&lt;/sub&gt;)</td>
<td>−0.24 [−0.38, −0.10]&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.21 [0.06, 0.36]&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.17 [−0.07, 0.41]</td>
</tr>
<tr>
<td>NNT</td>
<td>4.17&lt;sup&gt;*&lt;/sup&gt;</td>
<td>4.76&lt;sup&gt;*&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

* Statistically significant.

n = number of patients experiencing emesis, taking a soft/solid diet; N = number of patients in treatment group; empty spaces = no data (not studied, not reported, or different outcome measure); RR = relative risk; RD = risk difference; CI<sub>95</sub> = 95% confidence interval; NNT = number needed to treat.

Postoperative pain was not analyzed
- Missing data and different measurements

No adverse events from Dexamethasone

Strength
- Sensitivity analyses
- Dose recommended 1 mg/kg

Weakness
- Cannot be generalized to adult population
Intraoperative Dexamethasone

Carr et al, 1999

- Double-blind randomized controlled trial (34)
- Adults undergoing electrocautery tonsillectomy
- Dexamethasone (20mg) vs. saline
- Outcomes measured
  - Postoperative pain
  - Analgesic use
Although the dexamethasone group had lower pain scores this was not statistically significant.

No difference in groups for number of days off of work or to return to normal diet.

Dexamethasone group tended to require less analgesia but not statistically significant for 10 days postoperatively.
Postoperative Antibiotics

- Decrease bacterial colonization of pharyngeal tissues to reduce inflammation following tonsillectomy
- Pain reduction
- Improving oral intake
- Possibly decreasing postoperative bleeding
- Controversial: Bacterial Resistance
Postoperative Antibiotics

Telian et al, 1986

- Randomized controlled trial to evaluate the effect of ampicillin on recovery from tonsillectomy in children
- Ampicillin group had significantly fewer fevers, improved oral intake, and had fewer days to return to normal activity
Postoperative Antibiotics

Colreavy et al, 1999
- Randomized controlled trial in children (78)
- Amoxicillin/clavunanic acid
- Outcomes measured:
  - Bacterial profiles
  - Postoperative pain scores
  - Days to normal diet
  - Analgesic use
Postoperative Antibiotics

- O’Reilly et al, 2003
  - Randomized double-blinded controlled trial of the effect of antibiotics in adults following tonsillectomy
  - Study group given intraoperative and postoperative antibiotics while control group did not receive any
  - Outcomes measured
    - Postoperative bleeding
    - Postoperative pain
    - If PCP was contacted following surgery for pain/antibiotics
Results

- Antibiotic administration had no influence on postoperative pain and bleeding in adults

Weaknesses

- Tonsillectomy technique not standardized
- Recall bias
  - Patients questioned at follow-up or by mailed questionnaire
- High drop out rate
- High delayed hemorrhage in both groups (24%)
Current Practice Patterns

In 2004, Krishna et al. conducted a 13 question survey of AAO-HNS members regarding tonsillectomy (418)
- Experience
- Technique, and why
- Local anesthetic
- Perioperative steroids, and why
- Postoperative antibiotics, and why
<table>
<thead>
<tr>
<th>Years in practice</th>
<th>Monopolar</th>
<th>Bipolar</th>
<th>Blunt</th>
<th>Sharp</th>
<th>Harmonic</th>
<th>Laser</th>
<th>Suction</th>
<th>Ultrasonic</th>
<th>Coblation</th>
<th>Other</th>
<th>None given</th>
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<tbody>
<tr>
<td>&lt;5</td>
<td>54</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5–10</td>
<td>45</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>10–20</td>
<td>88</td>
<td>5</td>
<td>0</td>
<td>18</td>
<td>4</td>
<td>3</td>
<td>24</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>4</td>
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Technique

- Monopolar electrocautery used most often
  - Greatest for otolaryngologists in practice < 20 years
  - Hemostasis
- Sharp dissection most common for group in practice > 20 years
  - Decreased pain
  - Method of hemostasis not mentioned

Local Anesthetic evenly distributed
Steroids
- Most respondents used steroids
  - Decreased pain
  - Decreased nausea
  - Decreased swelling
- Those in practice > 20 years less likely

Postoperative Antibiotics
- Decreased pain
- Decreased infection/inflammation
- Faster Healing
Conclusions

- Tonsillectomy is a surgical procedure that carries significant postoperative morbidity.
- To minimize postoperative morbidity, various techniques and adjuvant therapies have been studied.
- There are many options available and it behooves an otolaryngologist to stay as up to date as possible.
Sources