Are newer techniques better?

Dave Albert
GOS
London
London - Big Ben

1859-New
Prague - Astrological Clock

600 year Anniversary

1410-Old!
My personal journey

1980  Dissection and ties
1985  Dissection/diathermy
1990  Bipolar diathermy
2010  Intracapsular
Which technique?

- Hot vs cold tonsillectomy
- Intracapsular vs Extracapsular
Cold Tonsillectomy Techniques

- Dissection
  - Scissors or dissector
  - Ties or diathermy
- Guillotine
- Snare
- Microdebrider
Hot Tonsillectomy Techniques

- Monopolar
- Bipolar (microscope)
- Diathermy scissors
- Radiofrequency
- Coblation (warm)
- Power varies 3-70W
Temperature at the tip

Sutton; British Journal of Surgery 2010
Temperature adjacent to the tip

Graphs showing temperature over time for different power settings and durations for Monopolar diathermy, Bipolar diathermy, Harmonic Scalpel™, and Ligasure™.
Temperature 1 cm from tip
Intra-capsular Tonsillotomy

- Guillotine
- Snare
- Microdebrider
- Coblation
Anatomy

Vessel size decreases with depth intra capsule

139/94/73 \( \mu \) artery
133/86/62 \( \mu \) vein

Lee 2008
How many ways are there to take out tonsils?

<table>
<thead>
<tr>
<th>OSA/Infection</th>
<th>Adult/Child</th>
<th>Dissection</th>
<th>Extra/Intra</th>
<th>Haemostasis</th>
<th>Diathermy</th>
<th>Power</th>
<th>Combinations</th>
</tr>
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<tbody>
<tr>
<td>OSA/Infection</td>
<td>Adult/Child</td>
<td>Sharp</td>
<td>Extra/Intra</td>
<td>Ties</td>
<td>Diathermy</td>
<td>Mono/Bi</td>
<td>Low/Med/Hi</td>
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<td>Sharp</td>
<td>Extra/Intra</td>
<td>Diathermy</td>
<td>Mono/Bi</td>
<td>Low/Med/Hi</td>
<td>48x</td>
</tr>
<tr>
<td>OSA/Infection</td>
<td>Adult/Child</td>
<td>Diathermy</td>
<td></td>
<td>Diathermy</td>
<td>Mono/Bi</td>
<td>Low/Med/Hi</td>
<td>24x</td>
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<td>OSA/Infection</td>
<td>Adult/Child</td>
<td>Coblation</td>
<td>Extra/Intra</td>
<td>Diathermy</td>
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<td></td>
<td>8x</td>
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<td>OSA/Infection</td>
<td>Adult/Child</td>
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<tr>
<td>OSA/Infection</td>
<td>Adult/Child</td>
<td>Laser</td>
<td></td>
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<td>4x</td>
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<tr>
<td>OSA/Infection</td>
<td>Adult/Child</td>
<td>Radiofreq</td>
<td></td>
<td>Radiofreq</td>
<td></td>
<td></td>
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</table>

Total Combinations: 120x
Outcome measures

Pain

slow recovery/time off school/days in hospital

Need for opiate analgesia

Parental time off work
Outcome measures

Regrowth

Occasional “tonsil remnants” in conventional tonsillectomy

Varying reports of regrowth with intracapsular techniques
Outcome measures

Bleeding

primary/secondary

return to hospital

return to theatre/ITU

Death - ? 1:40,000
Evidence

Cochrane review
UK Tonsillectomy audit
Tonsillectomy vs tonsillotomy
Coblation/microdebrider/dissection
Only 2 studies (Kujawski 1997; Nunez 2000) fulfilled inclusion criteria

Kujawski 1997
- binocular microscope and bipolar diathermy
- 100 patients
- dissection by scissors and bipolar haemostats
- 100 patients

Nunez 2000
- monopolar 70W
- 24 children
- haemostasis 30 W
- dissection /snare
- haemostasis 30 W
Advocates of evidence based medicine have criticised the adoption of interventions evaluated by using only observational data.

We think that everyone might benefit if the most radical protagonists of evidence based medicine organised and participated in a double blind, randomised, placebo controlled, crossover trial of the parachute.
UK tonsil audit

33,921 consenting patients
Primary haemorrhage 0.6%
Secondary haemorrhage 3%

Bipolar diathermy
Coblation 5 x higher than cold steel

Monopolar
Power a risk factor 7 x higher than cold steel
# Tonsillectomy Technique as a risk factor for postoperative haemorrhage

**The Lancet Vol 364 2004**

<table>
<thead>
<tr>
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<th>Primary Haemorrhage</th>
<th></th>
<th>Secondary Haemorrhage</th>
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<tbody>
<tr>
<td></td>
<td># events</td>
<td>Rate</td>
<td>Relative risk</td>
<td># events</td>
</tr>
<tr>
<td>Cold steel alone</td>
<td>8/1327</td>
<td>0.6%</td>
<td>1</td>
<td>10/1327</td>
</tr>
<tr>
<td>Cold steel + bipolar</td>
<td>14/3831</td>
<td>0.37%</td>
<td>0.61</td>
<td>95/3831</td>
</tr>
<tr>
<td>Bipolar forceps</td>
<td>14/3773</td>
<td>0.37%</td>
<td>0.62</td>
<td>137/3773</td>
</tr>
<tr>
<td>Monopolar</td>
<td>1/198</td>
<td>0.5%</td>
<td>0.84</td>
<td>11/198</td>
</tr>
<tr>
<td>Coblation</td>
<td>7/684</td>
<td>1%</td>
<td>1.7</td>
<td>23/684</td>
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Tonsillectomy Technique as a risk factor for postoperative haemorrhage

The Lancet Vol 364 2004

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<td>1%</td>
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The observation of a “dose-response relation” (a higher haemorrhage rate with usage of bipolar diathermy for dissection as well as haemostasis than for haemostasis only) suggests that the extent to which diathermy is used in a patient is linked with the amount of damage to the surrounding tissues.

This finding indicates that diathermy should be used with caution, and that the **power setting, frequency, and duration** of diathermy should be carefully controlled.
Welsh Audit

Tomkinson 2010, Laryngoscope

Data: 2003-2008

N=17480

All techniques with heat had significantly more chance of bleed

Power settings unclear
Swedish Audit: 15734 patients

Post-tonsillectomy haemorrhage rates are related to technique for dissection and for haemostasis. An analysis of 15734 patients in the National Tonsil Surgery Register in Sweden

Stalfors et al June 2015

Design: patient questionnaire 30/7 post op

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<tr>
<th>Techniques</th>
<th>Early PTHa N = 14654</th>
<th>Late PTHb N = 8880</th>
<th>RTTb N = 8772</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratio (CI)</td>
<td>P-value</td>
<td>Odds ratio (CI)</td>
</tr>
<tr>
<td>Cold steel + hot haemostasis</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Bipolar scissors</td>
<td>0.65 (0.49:0.87)</td>
<td>0.0033</td>
<td>1.53 (1.27:1.83)</td>
</tr>
<tr>
<td>Coblation</td>
<td>1.15 (0.88:1.53)</td>
<td>0.3605</td>
<td>1.15 (0.90:1.45)</td>
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<tr>
<td>Ultrascision</td>
<td>0.29 (0.11:0.78)</td>
<td>0.0142</td>
<td>2.01 (1.42:2.83)</td>
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Hot vs cold techniques - summary

3 large national audits have ALL highlighted increased 2˚bleeds with hot techniques (67,135 patients)

Power, frequency and duration all factors

Surgeons should *consider* reducing these factors
# Tonsillectomy (extracapsular) VS Tonsillotomy (intracapsular)

<table>
<thead>
<tr>
<th>Author</th>
<th>Journal</th>
<th>Year</th>
<th>Method</th>
<th>IC: ↓ pain/bleed</th>
<th>Remnant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bender B</td>
<td>Laryngoscope</td>
<td>2015</td>
<td></td>
<td>↓ pain/bleed</td>
<td>↑ remnant</td>
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<tr>
<td>Shapiro N</td>
<td>Laryngoscope</td>
<td>2014</td>
<td></td>
<td>↓ pain/bleed</td>
<td></td>
</tr>
<tr>
<td>April M</td>
<td>Arch Otol</td>
<td>2012 (meta)</td>
<td></td>
<td>↓ pain/bleed</td>
<td></td>
</tr>
<tr>
<td>Arcevedo</td>
<td>Otol HNS</td>
<td>2012 (meta)</td>
<td></td>
<td>↓ pain/bleed</td>
<td>(but <strong>not</strong> if restrict to high quality studies)</td>
</tr>
<tr>
<td>April M</td>
<td>Int J Ped Otol</td>
<td>2011</td>
<td></td>
<td></td>
<td>5% regrowth/0.5% need redo</td>
</tr>
<tr>
<td>Derkay</td>
<td>Otol HNS</td>
<td>2010</td>
<td></td>
<td>Microdeb ↓ pain/bleed</td>
<td></td>
</tr>
<tr>
<td>Hultkranz</td>
<td>Int J Otol</td>
<td>2005</td>
<td></td>
<td>IC: ↓ pain/bleed</td>
<td>same @ 6 yrs</td>
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<tr>
<td>Hartnick</td>
<td>Arch Otol</td>
<td>2006</td>
<td></td>
<td><strong>One side MIC vs One side EC</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MIC: ↓ pain/otalgia</td>
<td></td>
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Tonsillectomy summary

Hot techniques increase late bleeds

? should we alter our technique?
- reduce power/times
- mono>bipolar

Intracapsular is less painful

? at a cost of some regrowth
ESPO Meeting 2016/18

2016 - Lisbon

2018 - Stockholm
Thank
Well Done Wiggo!!

You