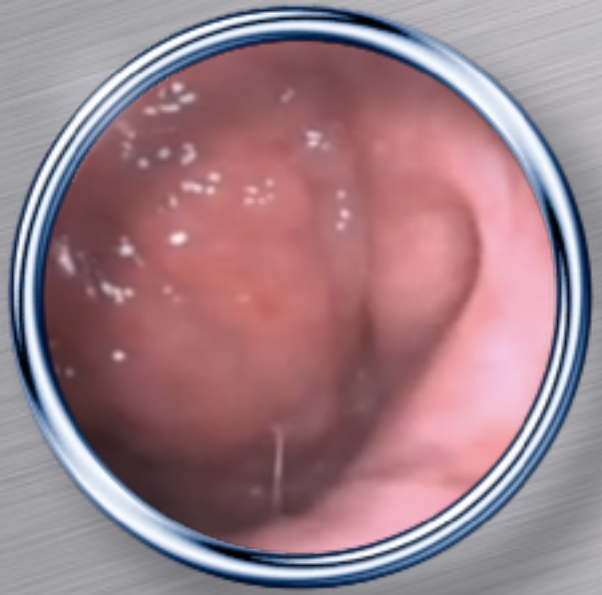
Are newer techniques better?

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

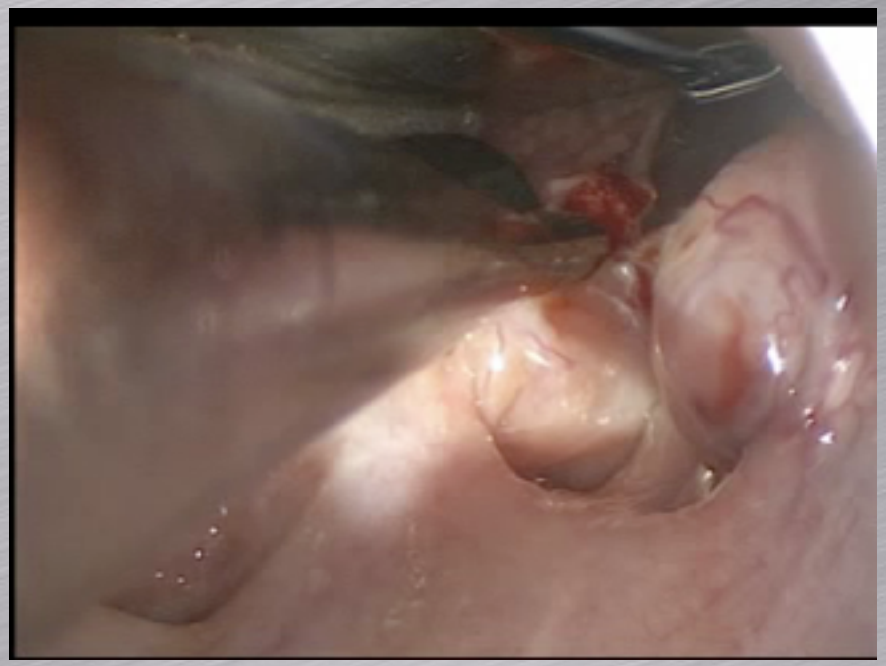
2010 Intracapsular

Which technique?

- Hot vs cold tonsillectomy
- Intracapsular vs Extracapsular

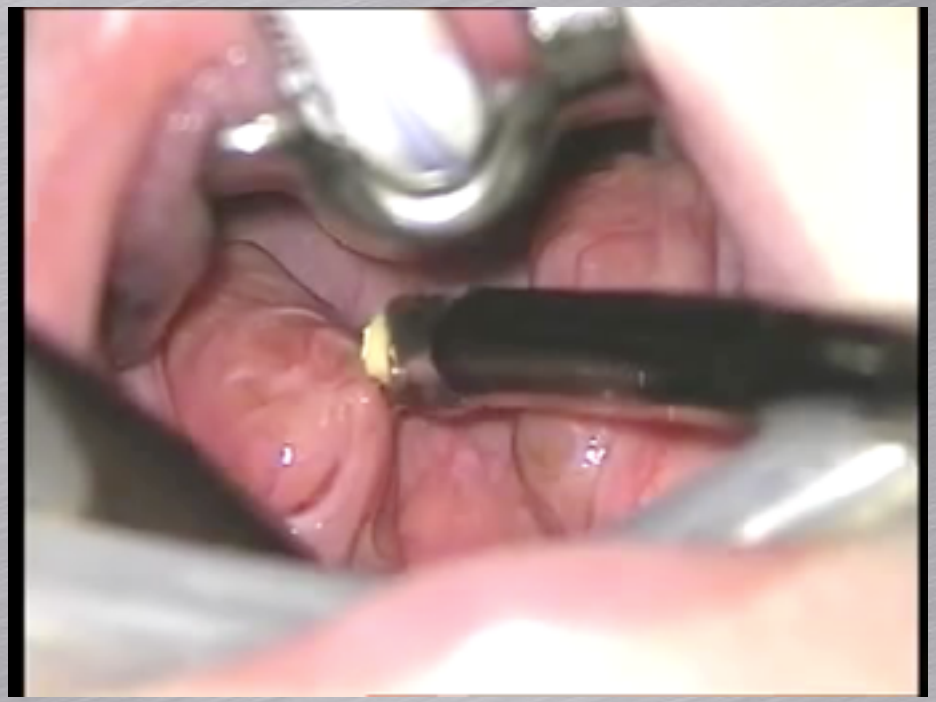
Cold Tonsillectomy Techniques

- Dissection
  - Scissors or dissector
  - Ties or diathermy
- Guillotine
- Snare
- Microdebrider



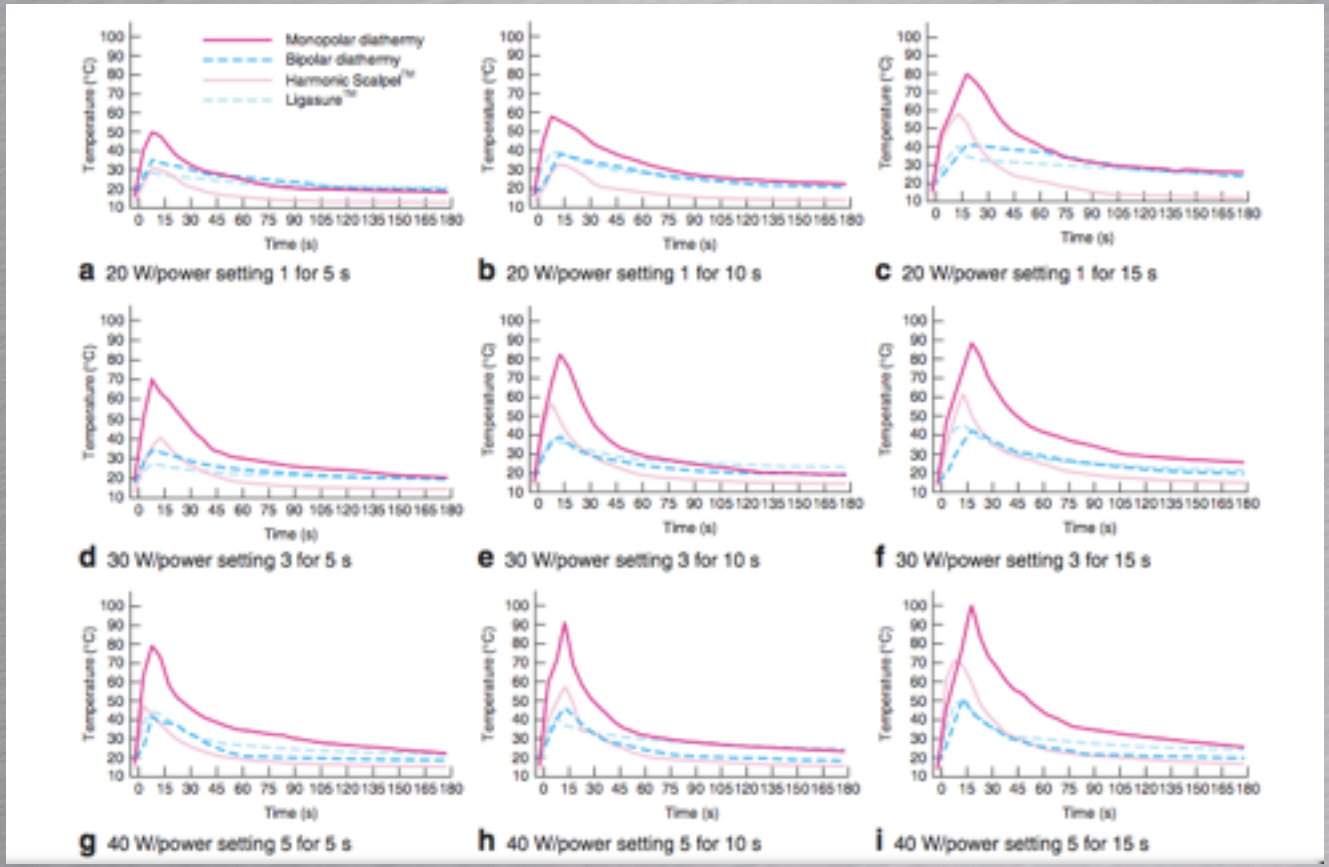
Hot Tonsillectomy Techniques

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

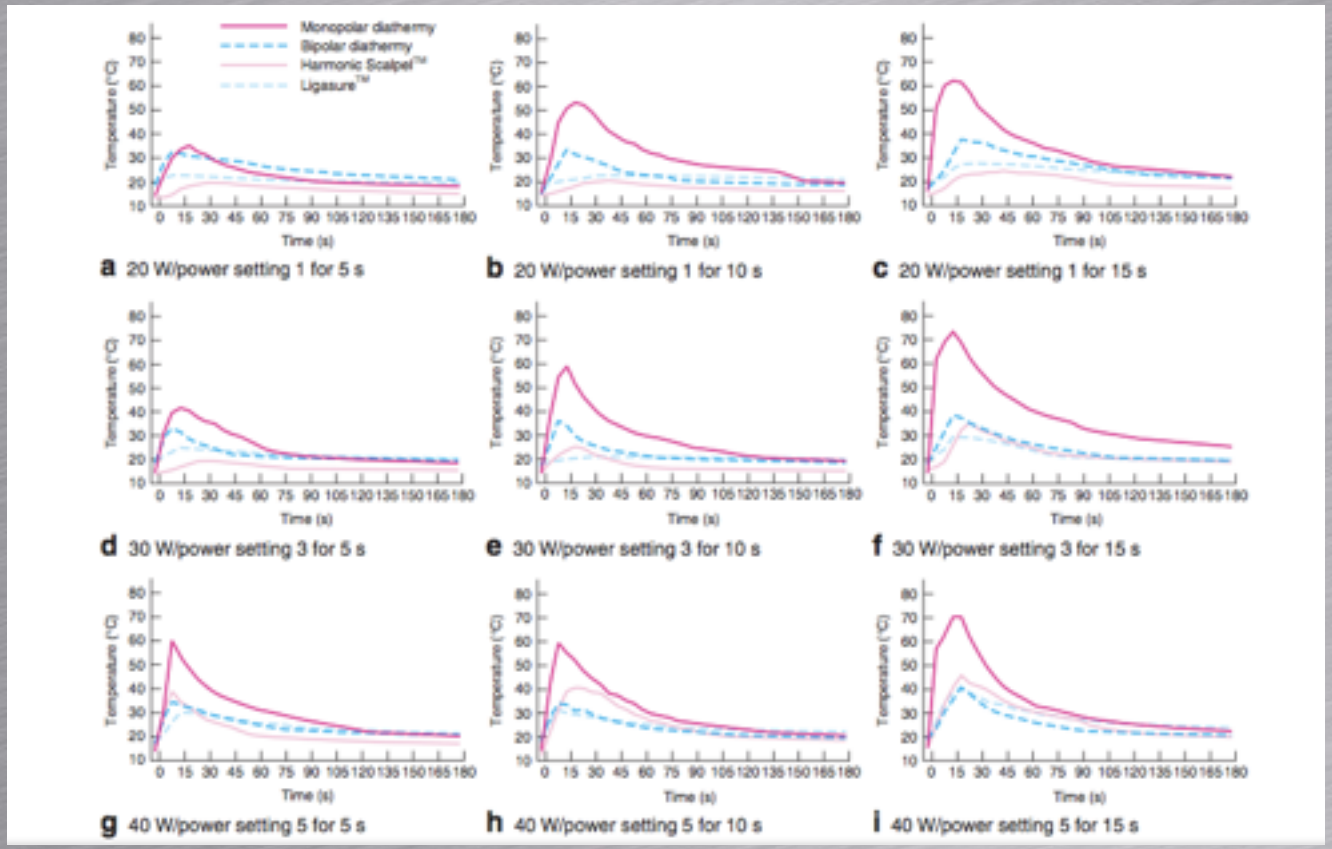


Temperature at the tip

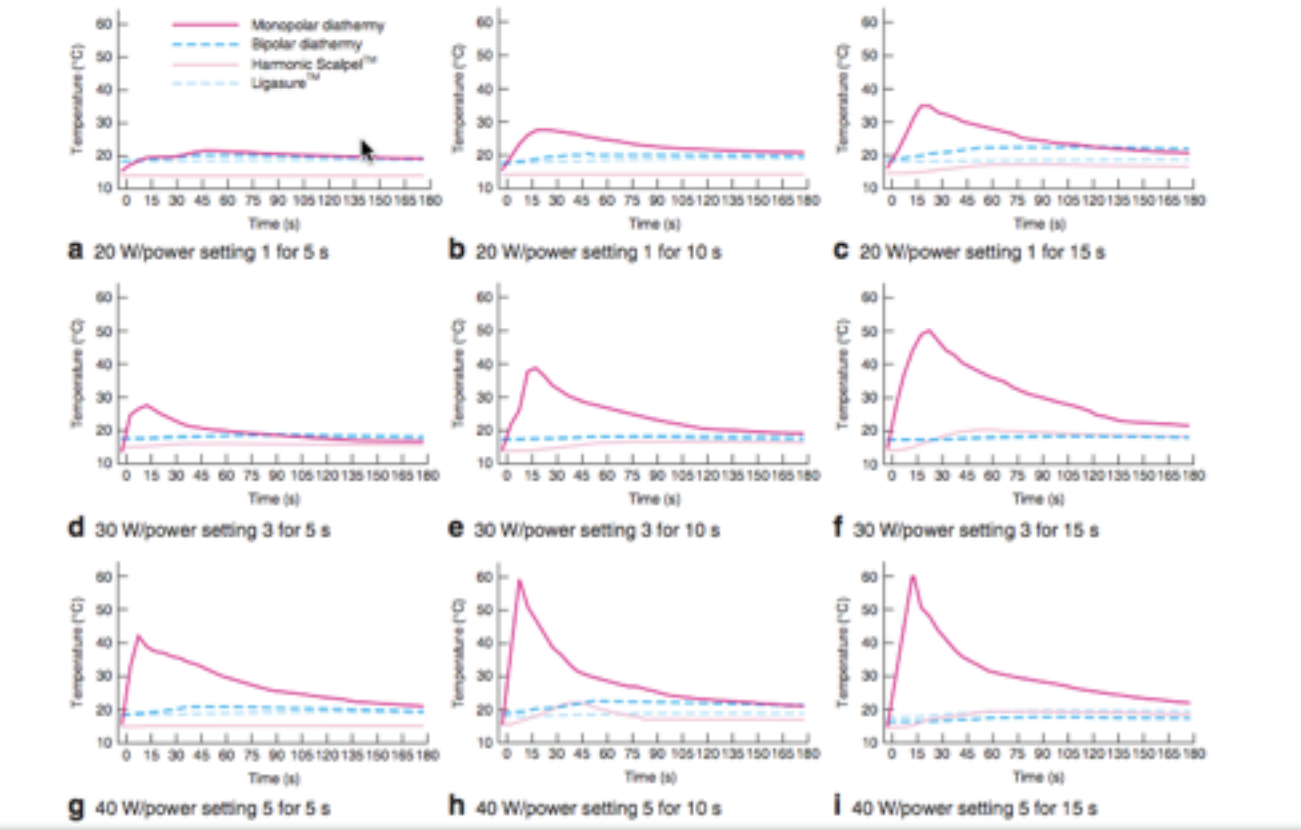
Sutton; British Journal of Surgery 2010



Temperature adjacent to the tip



Temperature 1cm from tip



Intra-capsular Tonsillotomy

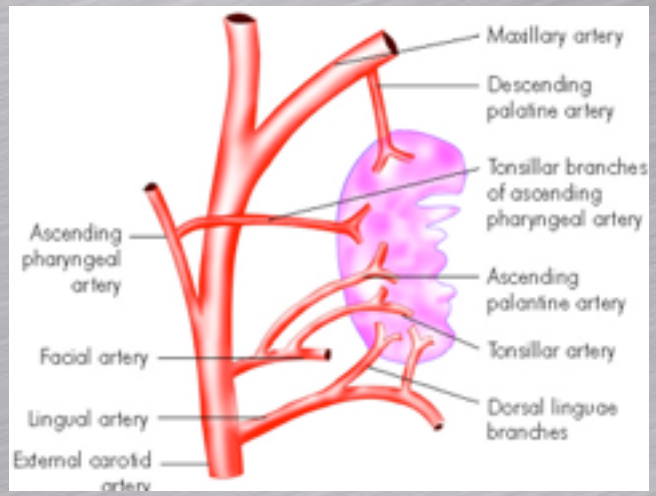
- Guillotine
- Snare
- Microdebrider
- Coblation

Anatomy

Vessel size decreases with depth intra capsule

139/94/**73** μ artery

133/86/**62** μ vein



Lee 2008

How many ways are there to take out tonsils?

OSA/ Infection	Adult/ Child	Dissection	Extra/ Intra	Haemostasis	Diathermy	Power	Combin-ations
OSA/Infection	Adult/Child	Sharp	Extra/Intra	Ties			8x
OSA/Infection	Adult/Child	Sharp	Extra/Intra	Diathermy	Mono/Bi	Low/Med/Hi	48x
OSA/Infection	Adult/Child	Diathermy		Diathermy	Mono/Bi	Low/Med/Hi	24x
OSA/Infection	Adult/Child	Coblation	Extra/Intra	Diathermy			8x
OSA/Infection	Adult/Child	Microdebrider		Diathermy	Mono/Bi	Low/Med/Hi	24x
OSA/Infection	Adult/Child	Laser		Laser			4x
OSA/Infection	Adult/Child	Radiofreq		Radiofreq			4x
							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

Cochrane Review 2011
Dissection versus diathermy

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 haemostasis 30 W**
  24 children
- **dissection /snare haemostasis 30 W**

Randomised Controlled Trial for Everything?

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 — 7 x higher than cold steel

Power a risk factor

Tonsillectomy Technique as a risk factor for postoperative haemorrhage
The Lancet Vol 364 2004

	Primary Haemorrhage			Secondary Haemorrhage		
	# events	Rate	Relative risk	# events	Rate	Relative risk
Cold steel alone	8/1327	0.6%	1	10/1327	.75%	1
Cold steel + bipolar	14/3831	0.37%	0.61	95/3831	2.48%	3.29
Bipolar forceps	14/3773	0.37%	0.62	137/3773	3.63%	4.8
Mono-polar	1/198	0.5%	0.84	11/198	5.5%	7.3
Coblation	7/684	1%	1.7	23/684	3%	4.5

Tonsillectomy Technique as a risk factor for postoperative haemorrhage
The Lancet Vol 364 2004

	Primary Haemorrhage			Secondary Haemorrhage		
	# events	Rate	Relative risk	# events	Rate	Relative risk
Cold steel alone	8/1327	0.6%	1	10/1327	.75%	1
Cold steel + bipolar	14/3831	0.37%	0.61	95/3831	2.48%	3.29
Bipolar forceps	14/3773	0.37%	0.62	137/3773	3.63%	4.8
Mono-polar	1/198	0.5%	0.84	11/198	5.5%	7.3
Coblation	7/684	1%	1.7	23/684	3%	4.5

Tonsillectomy Technique as a risk factor for postoperative haemorrhage
The Lancet Vol 364 2004

	Primary Haemorrhage			Secondary Haemorrhage		
	# events	Rate	Relative risk	# events	Rate	Relative risk
Cold steel alone	8/1327	0.6%	1	10/1327	.75%	1
Cold steel + bipolar	14/3831	0.37%	0.61	95/3831	2.48%	3.29
Bipolar forceps	14/3773	0.37%	0.62	137/3773	3.63%	4.8
Mono-polar	1/198	0.5%	0.84	11/198	5.5%	7.3
Coblation	7/684	1%	1.7	23/684	3%	4.5

Tonsillectomy Technique as a risk factor for postoperative haemorrhage

Bipolar Diathermy

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 qustionnaire 30/7 post op **POWER SETTINGS?**

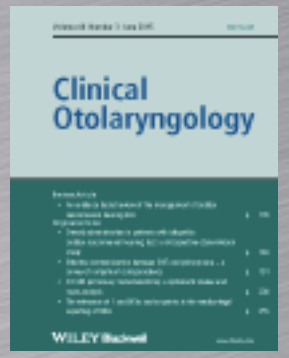
Techniques	Early PTH[a] *N* = 14654		Late PTH[b] *N* = 8880		RTT[b] *N* = 8772	
	Odds ratio (CI)	*P*-value	Odds ratio (CI)	*P*-value	Odds ratio (CI)	*P*-value
Cold steel + hot haemostasis	1		1		1	
Bipolar scissors	0.65 (0.49:0.87)	0.0033	1.53 (1.27:1.83)	<0.0001	1.19 (0.84:1.68)	0.3284
Coblation	1.15 (0.88:1.53)	0.3605	1.15 (0.90:1.45)	0.2603	0.90 (0.57:1.42)	0.6534
Ultrascision	0.29 (0.11:0.78)	0.0142	2.01 (1.42:2.83)	<0.0001	1.44 (0.75:2.77)	0.2695

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 qustionnaire 30/7 post op



Early PTH[a] *N* = 14654	
Odds ratio (CI)	***P*-value**
1	
0.65 (0.49:0.87)	0.0033
1.15 (0.88:1.53)	0.3605
0.29 (0.11:0.78)	0.0142

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 qustionnaire 30/7 post op

Late PTH[b] *N* = 8880	
Odds ratio (CI)	***P*-value**
1	
1.53 (1.27:1.83)	<0.0001
1.15 (0.90:1.45)	0.2603
2.01 (1.42:2.83)	<0.0001

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 qustionnaire 30/7 post op

RTT[b] *N* = 8772	
Odds ratio (CI)	***P*-value**
1	
1.19 (0.84:1.68)	0.3284
0.90 (0.57:1.42)	0.6534
1.44 (0.75:2.77)	0.2695

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)

Bender B	Laryngoscope	2015	IC: ⇓ pain/bleed ⇑ remnant
Shapiro N	Laryngoscope	2014	IC: ⇓ pain/bleed
April M	Arch Otol	2012(meta)	IC: ⇓ pain/bleed
Arcevedo	Otol HNS	2012(meta)	IC: ⇓ pain/bleed (but **not** if restrict to high quality studies)
April M	Int J Ped Otol	2011	5% regrowth/0.5% need redo
Derkay	Otol HNS	2010	Microdeb ⇓ pain/bleed
Hultkranz	Int J Otol	2005	IC: ⇓ pain/bleed same @ 6 yrs
Hartnick	Arch Otol	2006	**One side MIC vs One side EC MIC: ⇓ pain/otalgia**

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