

# REPORT OF A NATIONAL SURVEY OF TONSILLECTOMY

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## SOURCE OF DATA

Information received from individual hospitals following a questionnaire from DoH/BAO-HNS enquiring about the rate of primary and secondary haemorrhage following tonsillectomy ± adenoidectomy over two 5-month periods (1 July to 31 October in 2000 and 2001). The period in 2000 represents “re-usable tonsillectomy instruments” and the period in 2001 represents “single-use tonsillectomy instruments”.

### Inclusion criteria

Returned data forms giving both the rates of primary and/or secondary tonsillar haemorrhage for both 2000 and 2001 were included.

### Exclusion criteria

1. Spoiled forms.
2. Returned forms with incomplete data – either for yr2000 or yr2001.
3. Trusts which performed less than 20 operations in each period, many of which are private hospitals.
4. Data from private hospitals as many do not take emergency admissions, especially children.
5. Forms with dubious data – 0% bleeding entered for both primary and secondary haemorrhage in year 2000 and 2001.

## RESULTS AND COMMENTS

Altogether 142 forms were received. However, only 44 forms (from 44 different trusts) were analysed. These forms had complete data on the total number of tonsillectomies, number and rate of primary and secondary haemorrhage for the 5-month period in yr2000 and yr2001.

Reasons of exclusion of the other 98 forms:

Forms wrongly sent to PCT/Mental Health Care Trust	15
Spoiled forms	7
Hospitals which did not perform tonsillectomy	
Or < 20 tonsillectomies each year	17
Forms with incomplete data	25
Dubious form	10
Cannot separate adenoidectomies from tonsillectomies	1
Private hospitals	23

## Limitation of the national survey

- Many trusts/hospitals did not have audit data before and after the change of tonsillectomy instruments
- Some hospitals cannot separate tonsillectomy from adenoidectomy; many hospitals cannot separate tonsillar from adenoidal bleed
- Some figures on the returned forms are dubious e.g. 0% complication rate for every single entry
- Many hospitals share on call with neighbouring trusts and data of secondary haemorrhage not reliable
- Most private hospitals do not admit emergencies (certainly not in children), therefore figures for secondary haemorrhage not available
- The overall figures from any hospital represent the combine results of several surgeons, using a variety of techniques. It is difficult to tease out the 'bad techniques'
- Some surgeons introduced new techniques and abandoned them after a few cases
- Most trusts did not have figures on severity of bleeding

## Overall figures on primary and secondary haemorrhage

Combining figures from 44 hospitals/trusts:

Year 2000 (1 July to 31 Oct)	6774 tonsillectomies in total 29 primary haemorrhages returned to OT (0.43%) 317 readmissions for secondary haemorrhage (4.68%) 51 secondary haemorrhages returned to OT (0.85%) (data provided by 40 trusts only = 5999 T's)
Year 2001 (1 July to 31 Oct)	6783 tonsillectomies in total 65 primary haemorrhages returned to OT (0.96%) 345 readmissions for secondary haemorrhage (5.09%) 47 secondary haemorrhages returned to OT (0.78%) (data provided by 40 trusts only = 6035 T's)

Please see enclosed figures for the Scottish tonsillectomy audit for yr2000 and yr2001 and the Complication Rates after tonsillectomy from 1995 to 2000 based on Hospital Episode Statistics (Annex A).

The overall rates of primary and secondary haemorrhage in yr2000 and yr2001 in England were similar to Scotland. Overall, there was no increase in the rate of haemorrhage. There was also no increase in the rate of secondary haemorrhage that required returned to the OT. It is interesting that according to the HES figures, there was an increase in complication rate following tonsillectomies of 0.5% – 0.6% per year from 1995 to 2000 (with an actual increase in nos. of complications every year).

### **Direction of change of rate of primary and secondary haemorrhage**

44 hospitals/trusts were analysed:

	Primary haemorrhage	Secondary haemorrhage
Rate gone up in 2001	18	24
Rate gone down in 2001	12	17

### **Rate of haemorrhage from individual hospital/trust**

There was a big variation in the rates of primary and secondary haemorrhage following tonsillectomy amongst the hospitals in England. Based on the returned figures from 41 trusts:

	Rate of Primary H'age		Rate of Secondary H'age	
	Median	Range	Median	Range
Year 2000	0%	0 – 3.57%	4.9%	0 – 14.2%
Year 2001	0.55%	0 – 4.8%	4.76%	0 – 14.0%

### Change of surgical technique as a result of the introduction of single use instrument

Ten out of 44 hospitals reported a change of the surgical technique directly as a result of the policy of single use instrument for tonsillectomy. The code number of each hospital, change of surgical technique, secondary haemorrhage rates before and after change are shown in the table below.

Code No.	Change of surgical technique	2 <sup>y</sup> h'age rate before	2 <sup>y</sup> h'age rate after
10	Used more dissection + ties; a trial period of using harmonic scalpel, abandoned because of problems	11.6%	13.2%
13	Trainees used more ties; more use of Coblation	5.9%	6.7%
47	Used more Coblation + bipolar diathermy	6.8%	9%
61	Changed from using ties to bipolar diathermy (this hospital do not have ENT on-call at weekend)	0%	0%
83	Changed from using monopolar and ties to bipolar diathermy	7.2%	14.0%
97	2 surgeons started dissection with bipolar diathermy	7.14%	3.57%
120	Changed from diathermy scissors to ties	5.81%	2.4%
122	Stopped using guillotine	5.84%	9.27%
124	2 surgeons changed from monopolar to bipolar diathermy but this was not related to the post-op bleeds	3%	5%
132	Changed to using more ties and less diathermy	6.1%	2.6%

### Observations:

- There was a wide spread of primary haemorrhage rate amongst the hospitals, both in yr2000 and yr2001. Out of 44 hospitals, 3 hospitals had rate >2% in yr2000 and 7 hospitals had rate >2% in yr2001. (A previous national prospective tonsillar audit showed that the primary haemorrhage rate was 0.8%).
- Using 8% as unacceptable “threshold” for secondary haemorrhage (50% more than national average), 3 hospitals were above the “threshold” even in yr2000 but 9 were above this “threshold” in Year 2001 (2 hospitals had haemorrhage rate above 8% both in yr2000 and yr2001).
- The difference in the complication rates of individual hospitals between yr2000 and yr2001 was not as high as the variation in complication rates amongst the different hospitals in any particular year.
- **Some trusts experienced a great increase of secondary haemorrhage, many related to increasing use of diathermy following introduction of single use instrument. On the other hand, some trusts experienced less bleeding because of increasing use of ties, due to poor quality diathermy forceps.**

**Conclusion:**

There is no overall increase of complication between yr 2000 and yr2001. However, there appears to be a wide variation in the tonsillectomy complication rates between hospitals. Some hospitals have indeed experienced an unacceptable increase in complication rate in yr2001. There is an urgent need for a prospective study to understand the reason behind the great variation of complication rate between hospitals.

## DATA FROM SELECTED HOSPITALS

### AIM OF STUDY

To extract information from hospitals with reliable data to find the “key pointers” for the prospective audit.

### METHOD OF SURVEY

Members of BAO-HNS had been approached individually by mail inviting them to share the tonsillectomy data if they were concern about it. Also, based on the returned data from the DoH/BAO-HNS survey, trusts with high complication rate were contacted. The survey of these selected hospitals was conducted by Mr. Keith Hughes, one of the members of CPAG, using telephone and e-mail.

### INFORMATION OF NOTE:

#### 1. Effect of bipolar diathermy (tip size and diathermy setting):

##### Hospital A

1<sup>st</sup> Aug – 12<sup>th</sup> Sept 2001 (single used instruments)

145 tonsillectomy cases (secondary h'age rate – 9.5%)

43% ties – 0.6% secondary h'age

57% diathermy (bigger tip; higher power settings) – 16.8 % secondary h'age

24<sup>th</sup> Sept – 2<sup>nd</sup> Nov 2001 (single use instruments with smaller diathermy forcep tips)

107 tonsillectomy cases (secondary h'age rate - < 1%)

29% ties

71% diathermy (smaller tip; power setting below 15 W)

Secondary haemorrhage in 1 patient only (with tie)

##### Hospital B

Adults: July – Oct 2001 120 cases

27 re-admitted with bleeding

All were tonsillectomy using bipolar diathermy for haemostasis (25-30 watts)  
=35% of diathermy cases.

All managed conservatively

Nov 2001 35 cases

1 re-admission (3%)

Higher quality bipolar diathermy forceps (15 watts)

Comments: Previous audit within the hospital showing secondary h'age rate at 4-5%  
Original quality instrument would not work unless used on high setting  
(quality of electrical material/connection)

## 2. Age of patient

### Hospital C

Keep continuous register of post-tonsillectomy bleed for over 7 years!!

Before change to single use instruments:

2184 tonsillectomies; 194 secondary h'age (8.9%)

Age of patients important:	0-4	5%
	5-9	4.5%
	10-14	7.8%
	15-19	10.3%
	20-24	12.1%
	25-29	15.7%
	30-34	19.3%
	35-40	9.4%
	40+	5.7%

## 3. Severity of bleeding

### Hospital D

1<sup>st</sup> July – 31<sup>st</sup> Oct 2000: Primary h'age = 1.3%; Secondary h'age = 9.79%

1<sup>st</sup> July – 31<sup>st</sup> Oct 2001: Primary h'age = 1.4%; Secondary h'age = 7.25%

Although there is no statistical difference in rate between periods but severity much higher. During disposable instrument period 3 patients admitted to ITU – one with severe bleeding, one with airway oedema due to recurrent intubation. On death (32 year old Down's – high BMI. Secondary h'age – cardiac arrest. Resuscitated, tracheostomy – died).

### Hospital E

1<sup>st</sup> July – 31<sup>st</sup> Oct 2000: Secondary h'age = 5%; 1% requiring emergency operation

1<sup>st</sup> July – 31<sup>st</sup> Oct 2001: Secondary h'age = 7%; 6% requiring emergency operation!!

#### 4. Grade of surgeons

##### Hospital F

March – August 2000:

253 cases with bipolar diathermy; secondary haemorrhage rate 11.1%  
(Cons 20%; SpR 9.4% SHO 20.7%)

185 cases with silk ties; secondary haemorrhage rate 4.3%  
(Cons 1.9%; SpR 2.5% SHO 2.6%)

Comments: Irrespective of surgeon grade secondary haemorrhage rate twice as high as with bipolar diathermy as opposed to traditional silk tie with diathermy only reserved for minor oozing.

##### Hospital G

Period – 2001 (all single use instruments) – method of haemostasis not specified

Cons 108 cases; 2 primary haemorrhage; 20 secondary haemorrhage (18.5%)  
SpR 70 cases; 1 primary haemorrhage; 8 secondary haemorrhage (11.4%)  
NCCG 75 cases; 2 primary haemorrhage; 12 secondary haemorrhage (16%)  
SHO 17 cases; 4 secondary haemorrhage (23.5%)

Comments: The rate of haemorrhage seems to be higher for consultants and SHOs

##### Hospital C

Had 7 years of prospective study. The haemorrhage rate for consultants was 9.65%, compared with 9.35% for middle grades, and 8.9% for SHOs and locums.

#### 5. Genuine increase of secondary haemorrhage rate following use of single use instruments

##### Hospital H

Prospective study since 1997. Significant increase in secondary bleed rates since use of single use instruments.

Hospital J showed, on the other hand, an increase in complication rate even before the use of single use instruments.

Period	4/99 – 3/00	4/00 – 3/01	4/01 – 22/01
Tonsils PCE's	794	515	341
Readmissions	38	33	27
% Readmissions	4.8%	6.4%	7.9%

## **6. Surgical techniques e.g. dissection using bipolar diathermy**

One obvious problem was that consultants within the same hospital used a variety of surgical techniques, which makes analysis difficult in this enquiry. Also, some surgeons introduced new techniques during the period of the present audit.

### Hospital K

Majority of operation performed by junior staff using bipolar dissection technique

Secondary h'age rate: yr2000 = 10.8%; yr2001 = 9.4%

### Hospital L

Majority of operation performed by junior staff using bipolar dissection technique

Secondary h'age rate: yr2000 = 5.4%; yr2001 = 9.9%

### Hospital M

Majority of operation performed by junior staff. Change of technique from blunt dissection + ties to bipolar dissection + bipolar diathermy.

Secondary h'age rate: yr2000 = 5%; yr2001 = 10%

### Hospital H

Prospective study since 1997. Significant increase in secondary bleed rates since use of single use instruments. Secondary h'age rate: yr2000 = 6.9%; yr2001 = 10.55%.

Before changing to single use instruments: a variety of techniques, from blunt dissection to bipolar scissors.

After changing to single use instruments: mainly bipolar dissection + bipolar diathermy (many done under waiting list initiative by 1 particular SpR trained from Hospital L.

## 7. Day cases Vs In-patient

Figures from Hospital N:

	Aug – Nov 2000	Aug – Nov 2001	p-value
Day Case	8.2%	15%	0.19
Adult (In-Patient)	5.9%	2.6%	
Adult (Total)	7.4%	9.4%	0.67
Children	2.2%	5.89%	0.1
All groups	4.0%	7.19%	0.14%

Although not statistically significant, there was a perceived increase in h'age rate in day cases – anaesthetic technique, pressure for high turn over rate?

## Annex A

### Result of a retrospective audit performed by the Scottish Otolaryngology Society

In yr2000 with reuseable instruments (1<sup>st</sup> July to 31<sup>st</sup> December), there were 2823 tonsillectomies and adenotonsillectomies.

In 2000	2823 total	16 primary returns	(0.56%)
		115 readmissions	(4.07%)
		23 secondary returns	(0.81%)
		All bleeds to theatre	(1.38%)
		All problems	(4.9%)
Patients with no documented problems			(95.1%)
In 2001	2842 total	16 primary returns	(0.56%)
		144 readmissions	(5.07%)
		27 secondary returns	(0.95%)
		All bleeds to theatre	(1.50%)
		All problems	(5.6%)
Patients with no documented problems			(94.4%)

### Complication rates after tonsillectomy on the basis of Hospital Episode Statistics

Period	tonsillectomies n	complications n (%)
1 April – 1 March		
1995-96	68,715	1,396 (2.0%)
1996-97	63,578	1,927 (3.0%)
1997-98	53,983	1,824 (3.4%)
1998-99	61,027	2,491 (4.1%)
1999-00	53,692	2,637 (4.9%)
2000-01	41,326	2,225 (5.4%)