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Original Article

One Year Audit of Post Tonsillectomy Haemorrhage at Limerick University Hospital, Ireland

Matin MA¹, Attique S², Hossain T³, Hughes J⁴, Prazenica P⁵, Almanassra A⁶, Ryan S⁷, Taous A⁸

Abstract:

Objectives: To assess post tonsillectomy haemorrhage and rate of readmission, their outcomes for patients operated by different consultant surgeons, using different methods, patients age, use of antibiotics during the period of one year and any relation with post tonsillectomy haemorrhage to these variables.

Study design: A retrospective audit of all tonsillectomies done in one year period by different consultants using different methods. Outcomes were measured for post tonsillectomy bleeding using the Flinders modification of Stammberger criteria.

Method: This was a retrospective study and data was collected from theatre log book Limerick University Hospital, Ireland. Total number of patient was 210. Tonsillectomy was done by different surgeons with different methods. Computer database Hype and daily ward round record sheets kept by the NCHD were utilized to collect number of patients admitted with post tonsillectomy haemorrhage.

Results: Out of 210 tonsillectomies done, 24 patients (11.4%) readmitted with post tonsillectomy bleeding and 7 patients (3.3%) returned to theatre. Haemorrhage is more observed in age group 12 or above than age group below 12 (26.4% vs 3.6%) and bipolar diathermy than coblation (25.0% vs 9.4%). There is no statistically significant differences in length of stay or use of antibiotic related to secondary haemorrhage. 58.3% of the readmitted patients were treated conservatively.

Conclusion: By using Flinders modification of Stammberger criteria, it gives types of haemorrhage and their severity. Prospective audit with introduction of new surgical proforma will allow ease of continual re audit of potential aetiological factors, operative outcomes and adverse events.

Key words: Tonsillectomy; post tonsillectomy bleeding, Stammberger criteria.

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1. Md Abdul Matin, Consultant ENT Surgeon, Limerick University Hospital, Ireland
2. Dr. Sarwar Attique, Registrar ENT, Limerick University Hospital, Ireland
3. Dr. Tanvir Hossain, Registrar ENT, Limerick University Hospital, Ireland
4. Dr. Joseph Hughes, Consultant ENT Surgeon, Limerick University Hospital, Ireland
5. Dr. Pavol Prazenica, Consultant ENT Surgeon, Limerick University Hospital, Ireland
6. Dr. Alaa Almanassra, Consultant ENT Surgeon, Limerick University Hospital, Ireland
7. Dr. Stephen Ryan, Consultant ENT Surgeon, Limerick University Hospital, Ireland
8. Prof. Ahmmad Taous, Professor of ENT, Pabna Medical College, Pabna

Address for Correspondence: Professor M A Matin, Consultant ENT Surgeon, Limerick University Hospital, St Nessian's Road, Dooradoyle, Limerick, Ireland. Email: matinfrcs@yahoo.com

Background to Audit

Tonsillectomy is one of the most commonly performed ENT operations .1 .In 2003/04, 50531 patients underwent tonsillectomy within English NHS Trusts.2 The common indications for tonsillectomy include obstructive sleep disordered breathing and recurrent acute tonsillitis3. A number of techniques may be used to remove the tonsils and previous evidence showed that the most popular tonsillectomy technique is cold dissection. The second most popular choice is bipolar diathermy, used for both haemostasis and dissection

4.Other techniques are also commonly used; these include coblation tonsillectomy, laser dissection, monopolar electrosurgery and use of the Harmonic scalpel. 4Haemorrhage is a common and potentially serious complication of this procedure .5.Haemorrhage may be minor and require no intervention; serious haemorrhage may require hospital readmission or return to the operation theatre. 6 Rarely post tonsillectomy bleeding is severe enough to result in severe morbidity and death 7-9 .According to Flinders modification of Stammberger criteria we classified post-tonsillectomy haemorrhages into those that occur within 24 hours (primary) and those that occur after 24 hours following surgery (secondary). We also classified bleeding severity from A (minor) to E (death) 10 .

Audit was designed with retrospective data collection, using audit proforma and Flinder modification of Stammberger criteria.

Materials and Methods:

Ethics

Ethical clearance was taken from the Head of the Department of Otolaryngology and sent to ethical clearance committee for final approval.

Study place; Limerick University Hospital, Ireland

Audit period/Study Period; From January 2023 to December 2023

Patient selection and recruitment

Inclusion criteria

All patients ,children and adults, undergoing tonsillectomy or adenotonsillectomy done by different consultants of Limerick university hospital were included.

Exclusion criteria

Patients were excluded if they underwent tonsillar biopsy, unilateral tonsillectomy, Tonsillectomy done by the same consultant outside this hospital or by other surgeons in different hospitals. Tonsillectomy done by the trainee surgeons or Registrars of this hospital were also excluded.

Data collection

Total number of tonsillectomies done by different surgeons with different methods were collected from the theatre log books. Numbers of patients returned to theatre for arrest of bleeding were also collected from theatre log book. Computer database Hype and daily ward round record sheets kept by the NCHD were utilized to collect number of patients admitted with post tonsillectomy haemorrhage.. Age & sex information were taken from theatre log book for all tonsillectomy patients and from audit pro forma for all patients admitted with post tonsillectomy haemorrhage . All post tonsillectomy haemorrhage were classified as primary and secondary and bleeding severity were classified using Stammberger criteria (Table I)

Audit method :

Audit was designed with retrospective data collection, using audit proforma and Flinder modification of Stammberger criteria.

Data analysis

The statistical analysis were performed using the SPSS-22

Fig 1 Audit Proforma

1. Patient's informations	Name
DOB	
Sex	
MRN No	
2. Date of operation	Bilateral /Unilateral tonsillectomy
3. Symbolic name of Surgeons	A
B	
C	
D	
E	
4. indications	Rec. tonsillitis / H/O quinsy/ For biopsy/ other
5. Methods of tonsillectomy	Coblation extracapsular
Coblation intracapsular	
Bipolar	
Cold steel dissection	
6. Haemostasis technique	Coagulation with coblation/ Bipolar / monopolar/ties
7. Use of antibiotics	yes / no
8. Planned length of stay	Day case/ Inpatient
Classification	Description
Haemorrhage classification	PS Primary bleed ,within 24 hours following extubation Secondary bleed, after 24 hours after surgery
Bleeding severity classification	
A	Minor reported bleed, or blood tinged sputum; no bleed on examination, clot may be present , no shock
B	Active bleeding under examination, no active bleeding but larger bleed reported; no shock
C	Surgical treatment under G/A, theatre intervention, no shock
D	Massive haemorrhage causing shock or need blood transfusion
E	Death due to haemorrhage or haemorrhage related complications.

Table I (Flinders modification of Stammberger Criteria

Results:**Sample size**

A total of 210 patients underwent tonsillectomy during this one year audit period from January 2023 to December 2023 by 5 consultants using different methods of tonsillectomy (Table II).

Age :

138 patients(65.7 %) were under 12 years of age at the time of surgery and 72 (34.3%) were 12 years or older. (Table III)

Surgical methods

Table IV demonstrates surgical technique. Intracapsular coblation tonsillectomy is the

most commonly used technique done by consultant A and D, 97 patients, 46.2%, next method is extracapsular coblation tonsillectomy done mostly by consultant B (83 patients, 39.5%). Consultant C and E used bipolar diathermy tonsillectomy in 28 patients (13.3%). Cold steel method was not used in any case excepting 2 cases by consultant A (0.95%) in case of fibrotic adult tonsillectomies. So 180 tonsillectomies were done by coblation method (85.7%) and 28 tonsillectomies were done by bipolar diathermy method (13.3%)

Post tonsillectomy haemorrhage

Of the 210 patients, 24 patients (11.4%) admitted with post tonsillectomy secondary haemorrhage and 7 patients (3.3%) returned to operation theatre. (Table V)

Risk of post tonsillectomy bleeding related to age, use of antibiotics, length of stay, techniques

Table VI demonstrated the related risk. Post tonsillectomy bleeding is more observed in age group 12 or above, 26.4% in comparison to 3.6% in age group below 12. Out of 24

patients admitted with post tonsillectomy bleeding, 17 from coblation methods (9.4%) and 7 from bipolar (25.0%) indicating bipolar is the most commonly used method causing post tonsillectomy haemorrhage. There is no statistically significant differences in length of stay or antibiotic use.

Table II: Number of tonsillectomies done by different consultants

Name of consultant	No of cases	Percentage
A	82	39.0%
B	69	32.8%
C	21	10.0%
D	31	14.9%
E	7	3.3%

Table III: Age group

Age group	Number	Percentage
<12	138	65.7%
>= 12	72	33.4%

Table IV: Methods of tonsillectomy performed by different Surgeons

Surgeon	Coblation intracapsular	Coblation extracapsular	Bipolar	Cold steel
A	70	10		2
B		69		
C			21	
D	27	4		
E			7	

Table V: Readmission with post tonsillectomy bleeding

Total no of tonsillectomy	Total readmission	Patients taken back to theatre
210	24 (11.4%)	7 (3.3%)

Table VI: Risk of post tonsillectomy bleeding

Variable	Number of patients bleeding	Post tonsillectomy	Percentage
a. Age			
Below 12	138	5	3.6%
12 or >	72	19	26.4%
b. Techniques			
Coblation	180	17	9.4%
Bipolar diathermy	28	7	25%
Cold steel	2	0	0%
c. Length of stay			
Day case	110	13	11.8%
Inpatient	100	11	11.0%
d. Use of antibiotic			
Antibiotic used	113	13	11.5%
Antibiotic not used	97	11	11.34%

Classification of post operative haemorrhages

According to Flinders modification of Stammberger criteria (Table I) category A includes mild post operative bleeds, which required no treatment. More severe haemorrhages were categorized as B, C, D depending on severity of bleeding and treatment required.

Table VII: Category of post tonsillectomy haemorrhage according to Stammberger modification (Total No. 24)

Category	No of patients	Percentage (%)
A	14	58.3%
B	2	8.3%
C	7	29.2%
D	1	4.2%

Majority of the haemorrhages cases were identified as category A. (14 patients, 58.3%). 2 patients were under category B (8.3%),

7 patients were under category C (29.2%) and 1 patient needed blood transfusion (4.2%). No patient died (category E), and no patients experienced primary haemorrhage.

Discussion:

Discussion Tonsillectomy is considered to be one of the most common routine elective procedures in otolaryngology. Much has been documented around the risks of the procedure and the risk associated with different techniques 11. The National Prospective Tonsillectomy Audit found that a post-tonsillectomy bleed rate of 4% was an accurate representation 12. However, there are other studies that quote a wider range, with one analysis of all published papers reporting a re-bleed rate of 4.5% plus two standard deviations, suggesting a maximum rate of 13.9% 13. One study done by Parmar et al showed 11.9% readmission with post tonsillectomy bleeding over 460 tonsillectomies which is similar to our study(11.4%) but return to theatre was 1.1% whereas in our audit was 3.3% 11.

There were 6 more patients admitted with post tonsillectomy bleeding and 2 of them taken to theatre and managed by the consultant on call, where the operations were done outside by some other consultants. These patients are excluded from our study. Post tonsillectomy haemorrhage is classified as primary or secondary. Primary bleeds occur within the first 24 hours following surgery. The accepted incidence of primary bleeding is 0.5- 1% 14,15. Secondary haemorrhage occurs following the first 24 hours after surgery, and typically occurs between post-operative day 5- 10, and reported rates vary between 5-15% 16. In our study there was no primary haemorrhage observed. A systematic review and meta analysis done by Karam et al showed a statistically significant difference in the odd ratio analyses showing a lower rate of delayed hemorrhage for the coblation group in compare to bipolar diathermy (OR = 0.27, CI = 0.11 to 0.67, P = 0.005).17. Our audit shows similar result of higher secondary haemorrhage in bipolar group than coblation group (25.0%vs 9.4%)

Limitation of study and future audit plan

This is a single centre, short duration (one year) study with limited sample size (210). Some patients might have small episodes of bleeding at home which were not recorded as well as some patients might go to some other hospital with post tonsillectomy haemorrhage. Although this audit compares haemorrhage rate in relation to different surgical methods, age, length of stay, use of antibiotics, but it did not give detailed potential risk factors associated with post tonsillectomy bleeding. So prospective audit with introduction of new surgical proforma with detailed history, associated risk factors, duration of operation, post op analgesia, antibiotics, home telephone to know the updates of eating, drinking, any episode of

home bleeding etc. will significantly improve the quality of routinely collected data for tonsillectomies. This will thus allow ease of continual re audit of potential aetiological factors, operative outcomes and adverse events.

Authors Contribution

Abdul Matin, Joseph Hughes, Pavol Prazenica, Alaa Almanassra and Stephen Ryan initiated the Audit; Abdul Matin developed the protocol for the Audit and supervised its execution; Sarwar Attique and Tanvir Hossain coordinated the data collection supported by Abdul Matin. Sarwar Attique and Tanvir Hossain analysed the data, supported & Ahmad Taous by Abdul Matin, Joseph Hughes. Abdul Matin wrote the report with contributions from all project team members.

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