

The Incidence and Management of Post-Tonsillectomy Haemorrhage: A Singaporean Experience

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ABSTRACT

Aim of Study: To audit the incidence and management of post-tonsillectomy haemorrhage in the Singaporean context.

Methods: Three hundred and sixty-six consecutive tonsillectomies done over a 2-year period were retrospectively studied. Demographic details and indication for operation were evaluated in conjunction with the incidence and management of post-operative haemorrhage.

Results: 84.4% of the patients were adults while 58.7% were males. Chronic tonsillitis was the most common indication for operation (84.5%). The incidence of primary and secondary haemorrhage was 0.6% and 7.1% respectively. 3.8% of the patients had to return to the operation theatre to secure haemostasis. The use of post-operative antibiotics did not significantly affect the incidence of haemorrhage. There was no mortality from this complication. The haemorrhage rate was significantly higher among the adults ($p = 0.048$) and males ($p = 0.019$) in this study.

Conclusion: Our overall post-tonsillectomy haemorrhage rate was higher than that reported in most of the Western publications because adults rather than children predominated in our series. We report a low incidence of primary haemorrhage which is in keeping with the results of studies on electrodissection tonsillectomies. Our findings indicate that tonsillectomy is a safe procedure which can be performed on a day surgery basis if the patients are carefully selected.

Keywords: electrodissection tonsillectomy, Singaporean, post-tonsillectomy haemorrhage

INTRODUCTION

Tonsillectomy is probably the most common operation performed by an otolaryngologist. In the United States, approximately 340,000 tonsillectomies are performed annually⁽¹⁾. Post-operative haemorrhage is however a serious and potentially life-threatening complication. The first known tonsillectomy was believed to have been performed by Cornelius Celsus almost 2,000 years ago. He enucleated the tonsil with his fingernails

and then suggested that the 'fossae should be washed with a vinegar and painted with a medication to reduce bleeding' (McAuliffe - Curtin 1987)⁽²⁾. Modern day tonsillectomies are performed by blunt dissection, electrocautery or lasers in a more controlled environment. Haemostasis is secured using either ligatures, diathermy or laser coagulation of the bleeding vessels. In spite of these new techniques, post-operative haemorrhage remains an intractable problem. Most of the studies on the incidence and management of post-tonsillectomy haemorrhage come from the Western countries. Our aim was to study the local scope of this complication and to assess the safety of tonsillectomies in Singapore.

MATERIALS AND METHODS

This retrospective study consisted of 366 consecutive patients who had undergone tonsillectomies in 24 months, from January 1996 to December 1997. Information about patient population, type and time of occurrence of post-operative haemorrhage and their relationship to the population were extracted and tabulated. The management of haemorrhage was also examined. The operations included tonsillectomies with or without adenoidectomies as well as surgery for snoring and obstructive sleep apnoea (uvulopalatopharyngoplasties). The tonsillectomies were done under general anaesthesia by the electrodissection technique and haemostasis was secured with point diathermy. Post-operative antibiotics, if prescribed, was given for one week. The Valleylab Force 40 machine was used with the diathermy set in the fulgurate mode. A patient who is below the age of 12 years is considered a child.

Only haemorrhage from the tonsillar fossa was studied. Primary haemorrhage was defined as bleeding from the tonsillar fossa that occurred within 24 hours of the operation and secondary haemorrhage as those that happened subsequently. We take a serious view of post-tonsillectomy haemorrhage, hence all our patients were given clear instructions to return quickly if they develop haemorrhage, however minor it may be. Our

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strategy was to manage these patients actively. Patients with small bleeds that stopped on arrival to the hospital or with local measures performed in the clinic were admitted for observation and given intravenous antibiotics. The local measures used included clot removal, silver nitrate cautery and bipolar electrocautery in the clinic. Those with significant bleeds or small bleeds that did not resolve with local measures were quickly brought to the operation theatre to secure haemostasis. Our protocol was to give blood transfusion if haemoglobin concentration fell below 10g/dL.

The data was analysed using Fisher's exact test.

RESULTS

Demographics (Table I)

There were 309 adults (84.4%) and 57 children (15.6%) giving a ratio of approximately 5 adults to every one child operated on. The age range and mean age of the adults and children were 13 to 53 years (mean 27.3 years) and 3 to 11 years (mean 6.7 years)

Table I – Demographic profile

	Number	Percentage
1. Male	215	58.7
Female	151	41.3
2. Adult	309	84.4
Child	57	15.6
3. Chinese	212	57.9
Malay	128	35
Indian	24	6.6
Others	2	0.5

Table II – Indications for surgery

	Number	Percentage
1. Chronic tonsillitis	281	76.8
2. Chronic adenotonsillitis +/- OME	28	7.7
3. OSA & snoring	38	10.3
4. Previous quinsy	10	2.7
5. Others	9	2.5

OME: Otitis media with effusion

OSA: Obstructive sleep apnoea

Table III – Incidence and management of haemorrhage

Total number of patients: 28 (7.7%)

	Management	Number	Total
Primary haemorrhage	Local measures	0	2 (0.6%)
	Haemostasis in theatre	2	
Secondary haemorrhage	No treatment	4	26 (7.1%)
	Clot removal	2	
	Chemical cautery	2	
	Bipolar electrocautery	6	
	Haemostasis in theatre	12	

respectively. There were 215 males (58.7%) and 151 females (41.3%). Asians made up 99.5% of the patient population, of which the majority was Chinese (56.8%). Malays made up 35% and Indians, 6.6% of the patients.

Indications for surgery (Table II)

The majority of operations (76.8%) performed were tonsillectomies performed due to chronic tonsillitis. Adenotonsillectomies accounted for 7.6% of the cases. A significant percentage (10.2%) of tonsillectomies were done in conjunction with surgery for snoring and obstructive sleep apnoea. Only 10 patients (2.7%) had surgery for a previous quinsy.

Overall incidence and management of post-operative haemorrhage (Table III)

Twenty-eight patients (7.7%) developed post-operative haemorrhage, of which only 2 patients (0.6%) bled within 24 hours of the surgery. The secondary haemorrhages (7.1%) occurred most frequently on the 7th, 8th and 9th post-operative day (Fig 1). Six patients with minor bleeds were successfully treated in the clinic using bipolar electrocautery. Fourteen patients (3.8%) required surgical intervention to secure haemostasis. This group included both the two patients who had primary haemorrhage and 12 patients who developed secondary haemorrhage. The drop in haemoglobin concentration when compared with the pre-operative levels ranged from 0g/dL to 4.1g/dL.

Incidence of haemorrhage in relation to indication (Table IV)

Patients who underwent tonsillectomy for a previous quinsy had a higher haemorrhage rate (10%) than the overall rate. Two patients in our study whose surgeries were complicated by primary haemorrhage had undergone surgery for obstructive sleep apnoea (tonsillectomy and uvulopalatopharyngoplasty).

Statistical analysis of haemorrhage cases (Table V)

We noted with interest that 27 (8.7%) of the 309 adults had post-operative haemorrhage whereas only 1 (1.8%) of the 57 children in this study developed this complication (Table V). This difference is statistically significant ($p = 0.048$). Among the sexes, 22 males (10.2%) as compared with 6 females (4%) bled post-operatively and this difference is also statistically significant ($p = 0.019$). Patients with a previous quinsy did not have a significantly higher incidence of haemorrhage. The use of routine antibiotics did not influence the rate of haemorrhage.

DISCUSSION

Most publications which are related to tonsillectomies originate from the Western countries. The findings of these studies are therefore used as a basis for comparison with our results. There is however a difference in that the majority

Table IV – Incidence of haemorrhage in relation to indication

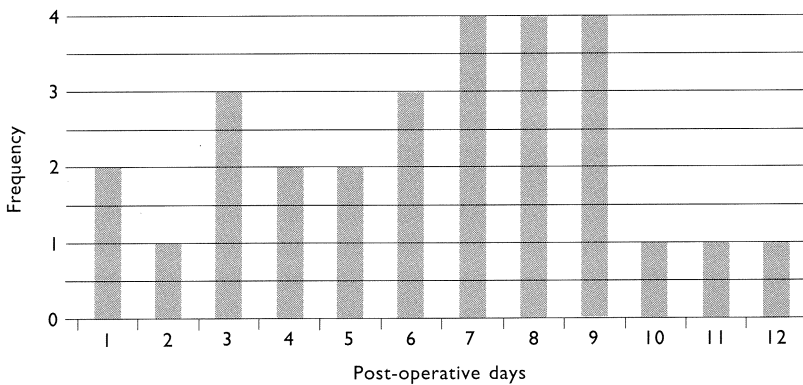
Indication for surgery	Primary haemorrhage	Secondary haemorrhage	Total	Percentage
1. Chronic tonsillitis +/- adenoiditis	0	25	25	8.1%
2. OSA & snoring	2	0	2	5.3%
3. Previous quinsy	0	1	1	10%
4. Others	0	0	0	0%

Table V – Statistical analysis of the patients who had haemorrhage

	Number	Haemorrhage	No haemorrhage	P (Fisher's exact test)
1. Male	215	22 (10.2%)	193	0.019 *
Female	151	6 (4%)	145	
2. Adult	309	27 (8.7%)	282	0.048 *
Child	57	1 (1.8%)	56	
3. Quinsy	10	1 (10%)	9	0.55 **
No quinsy	356	27 (7.6%)	329	
4. Routine antibiotics	302	21 (7%)	281	0.2 **
No antibiotics	64	7 (10.9%)	57	

* significant

** not significant

**Fig 1 – Timing of post-operative haemorrhage**

of tonsillectomy studies in the West were based on children⁽⁵⁻⁷⁾ whereas our study subjects were mainly adults. Bluestone⁽⁸⁾ and colleagues found that 60% of the tonsillectomies in the United States were performed in children less than 6 years of age. There are several possible reasons for this contrast. Firstly, we found that many Asian parents seem averse to the idea of their children undergoing surgery. The Westerners seem to have a more positive view and some of the parents even consider tonsillectomies as “routine” procedures. Furthermore, our general practitioners and paediatricians are more inclined to advocate conservative treatment for childhood chronic tonsillitis. There is also an undoubtedly higher incidence of otitis media with effusion (OME) secondary to chronic adenotonsillitis among Caucasian children. Rushton and

colleagues⁽⁹⁾ did a study comparing the incidence of OME in children between 5 and 6.03 years from a multicultural school in Hong Kong. He found that the Chinese children had a significantly lower incidence of OME compared to the Caucasian children in the same school.

There was a significantly higher incidence of post-operative haemorrhage in adults as compared with the children in this study. This finding is in agreement with the study by Roberts et al⁽³⁾ and by Myssiorek et al⁽⁴⁾. It is known that adults with recurrent tonsillitis develop adhesions and neovascularisation in the peritonsillar plane. The tonsillar bed incurs more trauma during dissection hence increasing the likelihood of developing infection of the tonsillar fossa, which is believed to be the cause of secondary haemorrhage.

The adult predisposition to post-operative haemorrhage may explain why the overall haemorrhage rate (7.7%) in our series of predominantly adult patients was higher than that reported in most Western publications. In the United States, Chowdury and colleagues⁽¹⁰⁾ reviewed 6,842 tonsillectomies done on children and reported an overall haemorrhage rate of 2.5%. Handler and colleagues⁽⁷⁾ also from the United States, reported a post-operative haemorrhage rate of 2.62% in 1,445 children studied while Kendrick et al⁽¹¹⁾ from the United Kingdom reported an overall haemorrhage rate of 3.9% in his series of 413 children. The series by Roy et al⁽¹²⁾ which also had predominantly adult patients reported a 5% incidence of haemorrhage. If we had considered only the children in our study, the haemorrhage rate (1.8%) would have been comparable with the Western figures. This highlights the importance of taking into account the age of the patients when comparing the overall haemorrhage rates of different studies for audit purposes.

In the 1940s, mortality rates from tonsil and adenoid surgery were as high as 1:2000⁽¹³⁾ with the majority of deaths from post-tonsillectomy haemorrhage occurring within 24 hours after surgery. It is generally acknowledged that primary haemorrhage is due to poor surgical technique and inadequate intraoperative haemostasis. Earlier papers on tonsillectomy have reported an equal incidence of primary and secondary haemorrhage^(5,6). In the past, a guillotine was used to sever the tonsil from its bed which was then left without treatment to allow for spontaneous haemostasis. The replacement of this technique with blunt dissection and electrodissection together with increased attention to haemostasis using either ligatures or diathermy has brought about a dramatic decline in the incidence of primary haemorrhage but the incidence of secondary haemorrhage has remained stable^(3,4,7,10,11,17). The electrodissection technique in particular is associated with a low incidence of primary haemorrhage. We experienced a primary haemorrhage rate of only 0.6% with this technique of dissection. In a retrospective review of 2,431 electrodissection tonsillectomies, Weimert et al⁽¹⁴⁾

did not report a single instance of primary haemorrhage. In other series, where blunt dissection was used, a 1% to 1.7%^(10,17) incidence of primary haemorrhage was reported. Opponents of electrodissection tonsillectomy however suggest that the technique is associated with an increased incidence of secondary haemorrhage. Tay⁽¹⁵⁾ did a conclusive prospective randomised study on 104 patients comparing electrodissection and the blunt dissection and ligation tonsillectomy and found no difference in the incidence of secondary haemorrhage between the two techniques. There were no reported primary haemorrhages with either technique in the abovementioned study.

Antibiotics are prescribed during the post-operative period in an effort to reduce the likelihood of secondary infection of the tonsillar fossa. However, the use of antibiotics did not significantly affect the incidence of post-operative haemorrhage in our series. Telian et al⁽¹²⁾ reported that routine antibiotics given at the time of surgery and post-operatively did not reduce the incidence of haemorrhage but there was a significant reduction in pain, mouth odour and poor oral intake, hence quickening post-operative recovery. There is hence a place for the use of antibiotics in the post-operative period.

The key to preventing the dire consequences of haemorrhage is early detection. The problem is that most of the bleeds occurred when our patients have already been discharged. We therefore emphasised on thorough patient counselling so that delayed bleeds can be detected as early as possible. All our haemorrhage cases were also managed actively in order to minimise blood loss. Local measures were applied diligently and the patients who continued to bleed as well as those with significant haemorrhages were immediately brought to the operation theatre. In our series, 3.8% of the patients had bleeds severe enough to warrant haemostasis under general anaesthesia. This accounted for 50% of all the patients who developed haemorrhage. The ratio was unexpectedly higher than the other studies which ranged from 2.8% to 39%^(7,17,18). We were not able to fully explain the reason for this discrepancy but it may be due to our "lower threshold" for bringing a patient to the operation theatre to secure haemostasis. There was however no mortality and none of the patients who bled required blood transfusion.

Guidelines published by the Royal College of Surgeons of England⁽¹⁹⁾ in 1985 stated that day case tonsillectomies should not be performed due to the risk of fatal primary haemorrhage. It must be noted that these recommendations were made before newer techniques like electrodissection and blunt dissection with diathermy coagulation of bleeding vessels were popularised. The low incidence of primary haemorrhage that can be achieved with these techniques coupled with the rising cost of hospitalisation have prompted several investigators to study the feasibility of day case tonsillectomies

in the present day context. Tewary⁽²⁰⁾ noted that the risks can be minimised through careful patient selection. He stated that day case surgery was contraindicated in those with major heart disease, airway disorders, bleeding diatheses and mental retardation. Social criteria such as adult supervision and easy access to hospital were also deemed important. Guida and Mattucci⁽²¹⁾ concluded that outpatient tonsil and adenoid surgery is safe provided the patients are monitored for a minimum of 6 hours post-operatively. In retrospect, we found that none of the patients in our series who met the criteria for selection developed primary haemorrhage. The 2 patients whose surgeries were complicated by primary haemorrhage, had surgery for obstructive sleep apnoea and therefore would not have been selected. Thus, using the selection criteria to exclude certain patients, we can perform tonsillectomies on a day surgery basis without compromising the patient's safety. This finding lends support to the Singaporean study by Chee et al⁽¹⁷⁾ where he concluded that day surgery would not add to the risks inherent in a tonsillectomy.

CONCLUSION

Adults with chronic tonsillitis form the bulk of the patients undergoing tonsillectomies in Singapore. We report a low incidence of primary haemorrhage which is in keeping with current trends. Our higher overall post-operative haemorrhage rate in comparison with the Western figures is attributed to the increased tendency for adults to develop post-operative haemorrhage.

Tonsillectomies can be safely carried out if a protocol of exhaustive patient counselling, good surgical technique and active management of post-operative haemorrhage is adhered to. Our findings also suggest that day case tonsillectomies are a reasonable option in Singapore provided the patients are carefully selected.

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