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Secondary post-tonsillectomy haemorrhage and informed consent

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Abstract

This is a prospective incidence study of 250 secondary post-tonsillectomy haemorrhages from a population of 2706 tonsillectomies performed over a seven-year period, which aims to ascertain the incidence and character of post-tonsillectomy secondary haemorrhage. Out of 250 post-tonsillectomy secondary bleeds (9.2 per cent of total; 95 per cent CI = 8.2 per cent – 10.4 per cent), 39 patients had a severe bleed (1.4 per cent; 95 per cent CI = 1.2 per cent – 2.1 per cent). The incidence of secondary tonsillectomy haemorrhage increased with age, peaking at 30–34 years in both men and women ($p < 0.001$), with no statistically significant difference between the two sexes ($p = 0.23$). The incidence of serious haemorrhage increases in the older age categories ($p = 0.005$) but is not influenced by gender ($p = 0.50$). The majority of secondary tonsillectomy haemorrhages presented between the fourth and seventh day post-operation (69.8 per cent). These results now provide the basis for informed consent for a tonsillectomy in our department.

Key Words: Tonsillectomy; Haemorrhage; Informed Consent

Introduction

Haemorrhage is the most common and serious complication following tonsillectomy.[1] Around 77 000 tonsillectomies are performed each year in England and Wales, representing 30 per cent of all ear, nose and throat (ENT) procedures performed per annum.[2]

The reported incidence of post-tonsillectomy secondary haemorrhage varies remarkably, from 0.8 per cent to 18 per cent, depending largely on the size and age of the population measured and the definition of 'bleeding' employed.[3–23] In our own department tonsillectomy is performed in 22 per cent of patients admitted for elective surgery, but post-tonsillectomy secondary haemorrhage is the cause of 78 per cent of re-admissions within 28 days of surgery.

We therefore undertook a review of our experience with secondary haemorrhage following tonsillectomy in the West Dorset and East Somerset region, in order to review the information we give to patients and to the parents of patients receiving a tonsillectomy.

Methods

This was a prospective incidence study over 84 months (June 1996 to June 2003) of all patients admitted for secondary tonsillectomy haemorrhage ($n = 250$). Over the study period 2706 tonsillectomies were performed. The surgery was performed by a number of different surgeons, using standard surgical techniques and post-operative care.

The details of those patients presenting with post-tonsillectomy bleeding after the first 24 hrs were entered into a database ($n = 250$). This focused on age, sex, the severity of bleeding and the number of days following surgery at which the patient presented. All patients underwent observation, with insertion of an intravenous line and fluid replacement as required. Antibiotics were administered in all cases.

The indicators for 'severe bleeding' were either the need for a blood transfusion or a return to the operating theatre to secure haemostasis under general anaesthetic. The same criteria have been adopted in a previous study.[11]

The data were statistically analysed using chi-squared and logistical regression (SPSS version 10.0).

Results

The age and sex distribution of all tonsillectomy patients ($n = 2706$) is shown in Figure 1. The modal age for tonsillectomies peaked at 5–9 years in males and 15–19 years in females. In this study there were significantly more females ($n = 1702$) than males ($n = 1004$) receiving a tonsillectomy ($p < 0.0001$).

There were 250 patients re-admitted with

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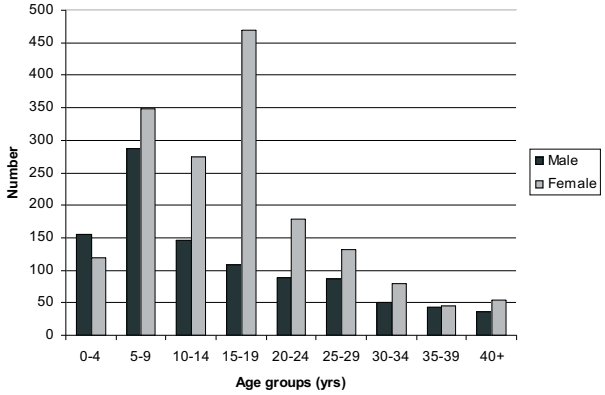


FIG. 1

Age and sex distribution of all patients admitted for tonsillectomy.

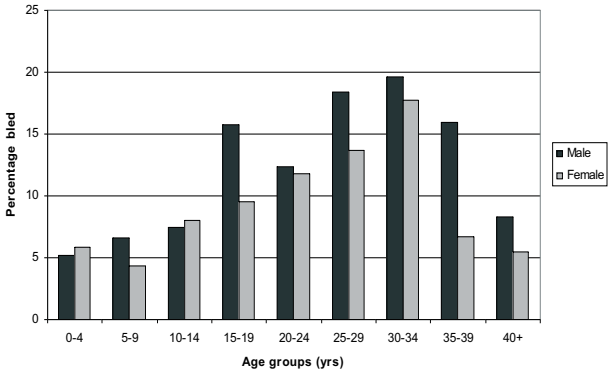


FIG. 2

Secondary haemorrhage rates, comparing males and females in different age groups.

secondary tonsillectomy haemorrhage out of the total patient group of 2706 (9.2 per cent; 95 per cent CI = 8.2 per cent – 10.4 per cent). There were 102 males and 148 females, with ages ranging from three to 52 years (mean = 19.2 years). Figure 2 shows the prevalence of secondary tonsillectomy haemorrhage by age and gender. Logistic regression analysis indicated no age by gender interaction for the prevalence of bleeding ($p = 0.86$). The prevalence was similar for males (102/1004 = 10.2 per cent) and females (148/1702 = 8.7 per cent) but not significantly different ($p = 0.23$). There were differences in prevalence by age ($p < 0.001$), with a clear peak in incidence at age 30–34 years in both sexes.

Out of the 250 patients presenting with secondary tonsillectomy haemorrhage, 39 had a 'serious bleed' (15.6 per cent) (Table I). This equated to a rate of 1.4 per cent (95 per cent CI = 1.2 per cent – 2.1 per cent) of the total patient group. Figure 3 displays the haemorrhage rate in different age groups, taking into account the proportions of 'serious' bleeders. Again, the peak in incidence at 30–34 years is shown. There was no significant difference between the sexes regarding presentation with serious haemorrhage ($p = 0.50$). Given the small numbers involved (Table I) and to enable statistical analysis of the serious bleeds with respect to age, the age groups had to be combined as follows: 0–9 years, 10–19 years, 20–29 years, ≥30 years). Serious bleeding was more likely in the older age groups [20–29 years (2.9 per cent), ≥30 years (2.3 per cent)] than in the younger groups [0–9 years (0.7 per cent), 10–19 years (1.2 per cent)] ($p = 0.005$).

Figure 4 shows the distribution of the days since surgery at which these bleeds presented. There was a clear peak at day six. The majority (69.8 per cent) of secondary tonsillectomy haemorrhages took place between the fourth and seventh day post-tonsillectomy. There was no significant difference between the sexes regarding timing of bleeding post-surgery ($p = 0.34$).

Discussion

The tonsil can weigh up to 20 g. There are five sources of arterial supply: the ascending pharyngeal artery, the ascending palatine artery, the anterior tonsillar branch of the lingual artery, the inferior tonsillar branch of the facial artery and the superior tonsillar branch of the descending palatine artery. Given this abundant vascular supply, it is not surprising that bleeding is the major complication of this surgery.

The incidence of secondary tonsillectomy haemorrhage reported from our institution shows a satisfactory comparison with those reported by other institutions, focusing on a variety of populations (Table II).

As regards the influence of age and gender on the presentation of secondary tonsillectomy haemorrhage, the consensus appears to concur with our data, indicating that there is an increase in

TABLE I

AGE, SEX AND INCIDENCE OF SECONDARY TONSILLECTOMY HAEMORRHAGE AND SEVERE HAEMORRHAGE

Age range	Non-bleeder group		Bleeder group (serious bleeds)		All patients	
(years)	Male	Female	Male	Female	Male	Female
0–4	147	113	8 (2)	7 (1)	155	120
5–9	268	334	19 (1)	15 (2)	287	349
10–14	136	252	11 (2)	22 (2)	147	274
15–19	91	425	17 (3)	45 (5)	108	470
20–24	78	157	11 (2)	21 (4)	89	178
25–29	71	114	16 (4)	18 (4)	87	132
30–34	41	65	10 (2)	14 (2)	51	79
35–39	37	42	7 (1)	3 (1)	44	45
≥40	33	52	3 (0)	3 (1)	36	55
Sub-totals	902	1554	102 (17)	148 (22)	1004	1702
Totals	2456		250 (39)		2706	

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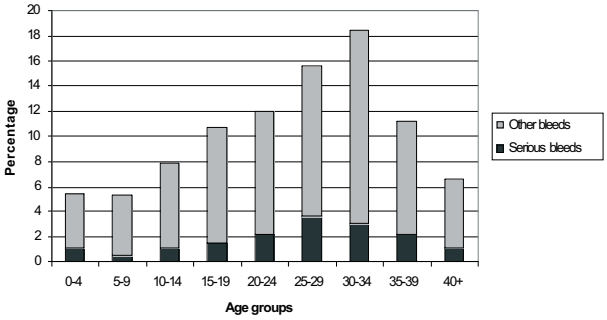


FIG. 3

Secondary haemorrhage rate in different age groups.

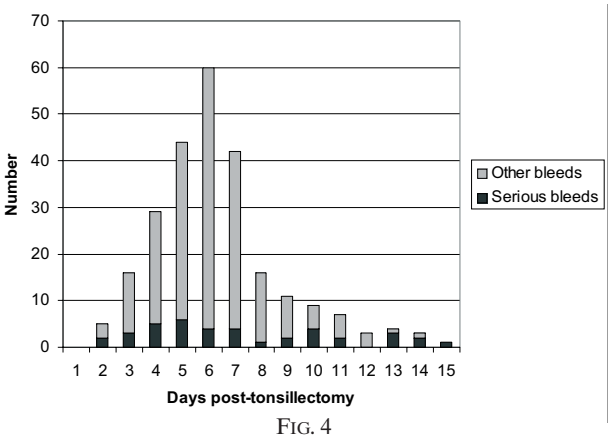


FIG. 4

Post-tonsillectomy day of secondary haemorrhage.

incidence in the older age categories measured[10,12–15,17] and no significant difference between genders.[4,8,12,17] However our data also indicated a peak in incidence at 30–34 years, a feature not reported in other studies.[4–23]

Two of the reviewed studies reported on the number of days following surgery at which the patient presented. Most patients presented on the

TABLE II

A COMPARISON OF STUDIES

Source Reference	Sample Size	Age range	Post-tonsillectomy secondary haemhorrhage rate		Definition of severity	Sex difference	Influence of patient age
			Overall (%)	Serious (%)			
4	511	All ages	2.94	0	NOS	No sig. difference	No sig. difference
5	149	All ages	2.94	NOS	NOS	NOS	NOS
6	2450	All ages	5 (re-admission) 18 (post-op questionnaire)	0.75	Return to theatre	NOS	NOS
7	164	All ages	11	NOS	NOS	NOS	NOS
8	775	All ages	2.70	NOS	NOS	No sig difference	No sig difference
9	756	2–83 yrs	NOS	0.93	Return to theatre	NOS	NOS
10	440	2.4–58.2 yrs	15.90	NOS	NOS	NOS	More common >30 yrs
11	NOS	1–16 yrs	NOS	0.30	Return to theatre and/or blood transfusion	NOS	NOS
12	1138	All ages	3	NOS	NOS	No sig. difference	More common >11 yrs
13	4848	0–15 yrs, >15 yrs	NOS	1.63, 3.9	Return to theatre	Males > females	More common >15 yrs
14	366	3–53 yrs	7.10	3.80	Return to theatre	Males > females	More common >13 yrs
15	4233	0–64 yrs	0.80	0.80	Return to theatre	NOS	More common >18 yrs
16	2391	All ages	2.18–5.32	NOS	NOS	NOS	NOS
17	4662	2–41 yrs	1.93	0.90	Return to theatre	No sig. difference	More common >20 yrs
18	494	All ages	2.8–7.9	NOS	NOS	NOS	NOS
19	1445	Children	2.49	1.03	Return to theatre	NOS	NOS
20	1603	3–16 yrs	2.30	NOS	NOS	NOS	NOS
21	96	17 mths to 40 yrs	6.25	NOS	NOS	NOS	NOS
22	1479	9 mths to 15 yrs	3.38	NOS	NOS	NOS	NOS
23	206	NOS	11.17	NOS	NOS	NOS	NOS
Our data	2706	3–52 yrs	9.20	1.40	Return to theatre and/or blood transfusion	No sig difference	Most common 30–34 yrs

NOS = not otherwise stated.

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seventh to ninth day[14] and the fourth to 13th day,[15] respectively. This is comparable with our own results.

Caution must however be employed when interpreting and comparing studies on secondary tonsillectomy haemorrhage. This is due to the wide variety of definitions used to classify bleeding, subjectivity in what degree of haemorrhage requires a defined level of intervention and the variety of operative techniques used by different surgeons. Thus, the search for a standard rate of secondary tonsillectomy haemorrhage for national comparison is an unobtainable goal at present and will remain so until standardized definitions can be agreed upon and widely used.

- **There are many previous articles in the literature that have examined the rates of secondary haemorrhage following tonsillectomy**
- **This article presents haemorrhage rates from one hospital over a seven-year period and reports that the prevalence rises with age, peaking between the ages of 30 and 34 years, and is not gender-specific**
- **The number of patients included is large but the study is retrospective and the surgical techniques used are not specified or standardized**

As a result of this paper we feel that the advice we should give patients and parents of patients regarding a tonsillectomy would be as follows:

(1) There is approximately a 9 per cent chance of bleeding overall, regardless of sex; however there is only a 1.4 per cent chance of a severe bleed requiring a blood transfusion or a return to theatre.
(2) Post-tonsillectomy bleeding is more common with increasing age, peaking at 30–34 years in both men and women, at which age a bleeding rate of between 18–20 per cent can be expected.
(3) Serious secondary post-tonsillectomy haemorrhage, as described, is more common in older patients (≥20 years) but its incidence is not affected by gender.
(4) The majority of post-tonsillectomy bleeds will take place between the fourth and seventh day after the operation.

This advice should increase patients' autonomy in the context of informed consent and help them understand the risk of suffering a post-tonsillectomy haemorrhage.

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