

LETTER TO THE EDITOR

Sluder banned from France!

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Sir,

Last spring the French Joint Commission (Haute Autorité de Santé, the independent scientific authority for quality of care) issued a recommendation banning the Sluder tonsillectomy from coverage by the public health care reimbursement scheme [1].

Greenfield Sluder (1865–1928) presented this method in 1910 [2]. The instrument of Sluder-Ballenger, incorrectly called the guillotine, given that its principle was based on pulling-out rather than cutting, played a critical role in the evolution of tonsil surgery. It led to the end of one era of tonsil surgery, tonsillotomy, and the beginning of another, tonsillectomy. Indeed, surgeons were comfortable with this instrument and performed tonsillectomy without having to learn a surgical technique and using several instruments. Now, various techniques are available, based upon dissection and/or the use of cauterization (ultrasound, radiofrequency, thermal energy, laser, microdebrider, etc.). However, in France 9% are still faithful to the instrument of Sluder-Ballenger [3].

The Commission working group associated five medical experts, all against the Commission's

recommendation. Indeed, there is no scientific evidence showing that post-tonsillectomy complications are technique-dependent. All data suggest that the Sluder tonsillectomy is safe and, in contrast, dissection may be responsible for more serious hemorrhage due to peri-tonsillar artery injury. The recommendation did not mention the expert's position. The pediatric otolaryngology society failed to get the decision repealed.

One can question the Commission's independence and scientific rationale. We question the consequences for the patients: numerous surgeons will have to perform a new technique, without a supervision plan during the learning period.

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The Sluder method in the Netherlands and the incidence of postoperative haemorrhage in a pediatric hospital

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ABSTRACT

Objective: Analysis of the method of tonsillectomy in use in the Netherlands and the incidence of postoperative haemorrhage in an academic tertiary pediatric referral hospital.

Study design and setting: (A) An explorative study of the Sluder tonsillectomy method in the Netherlands and (B) a retrospective case file review at the Sophia Children's Hospital in Rotterdam.

Methods: (A) A telephone and e-mail survey amongst 107 hospitals in the Netherlands. (B) A review of patients younger than 16 years who underwent a tonsillectomy or adenotonsillectomy between January 1, 1998, and February 22, 2008. This part of the study surveyed the intubated Sluder method and analyzed the incidence of primary and secondary haemorrhage in an academic tertiary pediatric referral hospital.

Results: (A) The Sluder method was commonly used in 102 (95.32%) hospitals; the traditional dissection technique was exclusively used only in five hospitals (4.67%). Of the 102 hospitals using the Sluder method, 67 (65.68%) report using only inhalation mask anaesthesia, while the remaining 35 use intubation. (B) Of 1797 patients studied, 40 patients experienced postoperative tonsillar haemorrhage (2.23%), with 35 (1.95%) patients primary haemorrhage of which 32 (1.78%) within 6 h after the surgery. Secondary haemorrhage occurred in five (0.28%) patients.

Conclusions: The Sluder method is still generally used in the majority of hospitals in the Netherlands today. Because of the low incidence of especially secondary haemorrhage and most of the primary haemorrhages occurring within 6 h after the surgery, this technique is ideally suited for day care tonsillectomy.

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1. Introduction

Tonsillas autem, quae postinflammationes induruerunt, cum sub levi tunica sint, oportet digito circumradere et evellere: si ne sic quidem resolvable, hamulo excipere et scapello excidere tum ulcus aceto eluere et inlinere vulnus medicamento, quo sanguis supprimitur.

(Now tonsils that have become hardened after inflammation, as they are covered by a thin membrane, may be scratched around with a finger and peeled out: if they cannot be removed they should be grasped with a hook and excised with a scalpel; the hollow rinsed with vinegar and the wound smeared with a medication to check the bleeding) [1] wrote Cornelius Celsus in his medical encyclopaedia 'published' around the year 25 AD, which is

the earliest description of tonsil pathology and tonsillectomy technique. Since then many different techniques have been introduced, including bipolar scissors, bipolar scalpel, microbipolar cautery, hot knife, cold knife, bipolar radiofrequency, coblation, monopolar and bipolar electrocautery, harmonic scalpel, cold steel dissection, suction cautery, KTP laser, argon plasma coagulation, thermal welding, snare/wire dissection, micro-dissection needle, contact diode laser, carbon dioxide laser, microdebrider and capsule splitting [2–7]. Nevertheless, no particular single method has gained universal acceptance.

Greenfield Sluder (1865–1928), an American otolaryngologist, demonstrated in 1911 that a complete removal of the tonsils could be performed using a guillotine-type device [8], adapted from the older uvulotome as described by Philip Physick in 1828 [9–11]. Tonsillectomy using the Sluder method has been in continuous use in the Netherlands almost since its introduction. With approximately 49,000 tonsillectomies per year and no fatalities during the past 10 years according to the Central Office for Statistics in the Netherlands (CBS), it seems to be a safe method.

The traditional dissection method is the dominant technique used in most parts of the world. For example, the Sluder method

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(both intubated and non-intubated) is banned from France since it was believed that there is a greater chance of aspiration during a Sluder operation (presumably this refers to the non-intubated operation), and this method therefore is not taught anymore [12]. However, there is no scientific evidence to show that the traditional dissection is preferable to the Sluder method [13], the latter certainly being faster than most other techniques.

Postoperative haemorrhage is the most important complication and recognized as an infrequent but potentially life-threatening complication of all (adeno)tonsillectomy procedures. Serious post-tonsillar haemorrhage with or without lethal outcome occurs predominantly as secondary bleeding [14]. The incidence of post-tonsillectomy haemorrhage is reported to occur with a range from 2.0 to 18.3% [15–19].

This study analyzes the incidence of the Sluder method, the differences in the use of the Sluder tonsillectomy in the Netherlands and the postprocedural outcome of all patients that underwent a Sluder tonsillectomy in combination with intubation in the tertiary referral pediatric Sophia Children's hospital over the past 10 years. Therefore this paper only comments on the safety of the Sluder method while the patient is intubated.

2. Materials and methods

This study consists of two parts. One part investigates the use of the Sluder method in hospitals in the Netherlands. The second part consists of a retrospective case file review at the Sophia Children's hospital. Both parts are explained below.

- (A) The use of the Sluder method was obtained by performing an analysis of its use in all the hospitals in the Netherlands where tonsillectomy is routinely carried out. Information was gathered by means of a simple e-mail and telephone survey of one or more of the otolaryngology specialists working in each hospital. Data for surgical technique, form of anaesthesia, and the patients' position during operation were collected. 11 out of 118 hospitals did not respond to the e-mail or telephone communication or refused to give out the data. This results in a response rate of 90.68%.
- (B) A retrospective case file review was carried out on 1912 patients, where the chart of every operated patient was reviewed separately. Patients were eligible for inclusion if they had a (adeno)tonsillectomy between January 1, 1998, and February 22, 2008 at the Sophia Children's Hospital in Rotterdam, and were below the age of 16 years at time of surgery. Patients undergoing a revision tonsillectomy, a unilateral tonsillectomy, tonsillar biopsy or a tonsillectomy related to cancer were excluded. Data was collected to determine the incidence of reported complications, post-operative tonsillar haemorrhage, blood transfusions, operative re-intervention, re-admission to the hospital and comorbidity (that required the surgery to be carried out in a pediatric hospital or patients with a syndrome). Primary haemorrhage was defined as haemorrhage occurring within 24 h of surgery, requiring operative re-intervention. Secondary haemorrhage was defined as any bleeding after 24 h (occurring between 1 and 28 days) of surgery that led to re-admission to hospital, though not necessarily to re-intervention. Moreover, both haemorrhages must originate from the tonsillar beds or the base of the tongue. These definitions are in accordance with other research done on the subject [14–16]. All the occurrences of haemorrhage were stratified in hours after primary surgery. The data of time of haemorrhage after surgery was missing in two cases of secondary haemorrhage.

Relatively inexperienced residents (1st or 2nd year) carried out most of the surgeries, however any complications were managed by the original surgeon under close supervision, or by the supervising specialist pediatric otolaryngologist.

All the information was collected and entered into a database management system (Excel) for analysis.

2.1. Technique of the operation

Traditional dissection method: The tonsil is partially dissected free, usually with a sharp incision in the mucosa of the anterior tonsillar pillar, and a snare is used to separate the lower pole. Dissection can take place under general anaesthesia with intubation, and occasionally under local anaesthesia.

Sluder method: There are a number of variations on this technique that are used in the Netherlands. However, all techniques involve the use of the Sluder guillotine, a misnomer as the instrument is not sharp and the tonsil is not actually cut. The Sluder guillotine is used to compress and hold the base of the tonsil while it is peeled out with the opposite index finger. The patient may be given only inhalation anaesthesia without intubation, or the procedure may be carried out with an intubated patient. This varies per hospital, and per surgeon.

An intubated patient is operated in a supine position. If a child can be intubated it is usually possible to remove the tonsils via the Sluder operation. Where a patient is difficult to intubate this is done with the help of a fiberoptic laryngoscope. After the removal of the tonsils, gauzes are packed in the fauces in order to achieve haemostasis. After 5 min these gauzes are removed and the tonsillar beds are inspected for persisting haemorrhages, which if present are staunched with bipolar coagulation or occasionally ligature. Due to the blunt avulsion of the vascular bundle coagulation is only rarely necessary. Patients with only inhalation anaesthesia can be operated in sitting and supine position. For this technique, the patient is given a short acting anaesthetic and wakes up almost immediately after surgery (± 30 s), so that the normal laryngeal protective mechanisms are functioning and the able to eliminate the blood from the throat. No packing is done. Thereafter, the patient is placed on his side on the operating trolley and taken to recovery.

Anaesthesia is given in the form of sevofluraan or isofluraan. Pre-operative pain medication is prescribed in the form of paracetamol 50 mg/kg. Postoperative pain management may vary between hospitals, and there is no standard medication. In the Sophia Children's hospital, paracetamol suppositories 50 mg/kg is given. Antibiotics are not generally used, except when endocarditis prophylaxis is required. In the Sophia Children's Hospital it is policy to intubate all (adeno)tonsillectomy patients so there is more available time to teach the Sluder method to 1st and 2nd year residents.

The Sluder method with intubation is the standard procedure in the Sophia Children's hospital. Of the 1912 studied patients undergoing a (adeno)tonsillectomy, 1797 (94.0%) were performed with the method of Sluder while the patient was intubated and 115 (6.0%) with the traditional dissection technique. The surgeon may convert to traditional dissection if he feels the Sluder method will not be successful. The traditional dissection method is preferred over the Sluder method when the patient has a small tonsillar size (grasping the tonsil by guillotine is then difficult), when the degree of fibrosis of the peritonsillar tissue is high (occasionally the case in older patients) or when patients are older than the 16 years.

2.2. Ethical considerations

Medical ethics committee approval is not required in the Sophia Children's hospital for a retrospective case file study.

3. Results

(A) Of the 107 hospitals (out of 118) in the Netherlands where tonsillectomy is carried out and for which information was available, the Sluder method is routinely used in 102 (95.3%) hospitals. Traditional dissection techniques are used exclusively in only five hospitals. This information is presented in Table 1. Of all 102 hospitals where the Sluder method is used, 67 (65.7%) hospitals report using the inhalation mask, without intubation, while 35 (34.3%) hospitals intubate their patients during the Sluder procedure. Results on patients' positions and infusion policy are presented in Table 2.

(B) Between January 1, 1998, and February 22, 2008, 1797 (adeno)tonsillectomy procedures at the Sophia Children's Hospital were done by the Sluder method in combination with intubation. Haemorrhage occurred in 40 (2.23%) of the 1797 cases. Of these 40 patients, 35 (1.95%) patients had a primary haemorrhage (within the first 24 h). A total of 32 (1.78%) primary haemorrhages occurred within 6 h of the (adeno)tonsillectomy.

Five patients (0.28%) suffered from secondary haemorrhage. Two of these cases required re-admission to the hospital for observation, though no surgical re-intervention was needed. The three (0.17%) remaining haemorrhages required patients to be re-admitted to the hospital, and to be operated again to stop the secondary bleeding. Detailed primary and secondary haemorrhage postoperative appearance in time is illustrated in Fig. 1. The postoperative haemorrhage characteristics are also summarized in Table 3. None of the patients required a blood transfusion after (adeno)tonsillectomy and a total of 26 (1.45%) of the 40 Sluder complications, had co-morbidity, while 1559 (86.76%) of 1797 patients were operated by 1st and 2nd year residents.

4. Discussion

The main findings of this study are first that differing from most other countries, the Sluder method for tonsillectomy is still extensively used in most of the hospitals in the Netherlands. Secondly, the tonsillectomy method in combination with intubation

Table 1
The usage of tonsillectomy techniques in the Netherlands.

	Hospital (n = 107)	%
Traditional dissection	5	4.67
Sluder	102	95.33

Table 2
Anaesthetics used with the Sluder method.

	Hospital (n = 102)	%
Only inhalation	67	65.69
Patient position		
Sitting	41	61.19
Lying	26	38.81
Infusion Y/N		
With infusion	23	34.33
Without infusion	44	65.67
Intubation	35	34.31
Patient position		
Lying	35	100
Sitting	0	0
Infusion Y/N		
With infusion	35	100
Without infusion	0	0

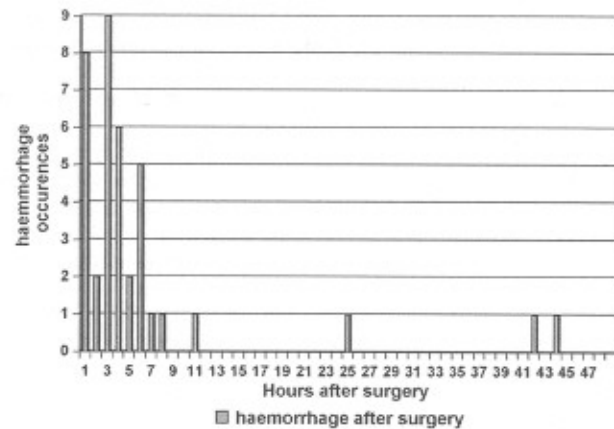


Fig. 1. Graph of the frequency of haemorrhage.

Table 3
Postoperative haemorrhage characteristics of the Sluder method.

Category	Haemorrhage (n = 1797)	%
Primary	35	1.95
Within 1 h	8	0.45
Within 6 h	32	1.78
After 6 h	3	0.17
Secondary	5	0.28
Total	40	2.23

has a remarkably low incidence of postoperative haemorrhage (2.23%), especially secondary haemorrhage (0.28%).

At the children's hospital we do not condone non-intubated Sluder tonsillectomy, and in this article simply report the incidence in other hospitals. In our hospital all patients are intubated for tonsil surgery.

The discontinuation of the Sluder technique in most other parts of the world is perhaps related to the original practice of operating the patient without intubation.

Hospitals vary according to their criteria, and while some will take into consideration only the age of the patient, others will only use this method under a certain weight class (generally under 30 kg). There is no consensus about this.

The study-group represents data from a tertiary pediatric referral hospital, with a relatively higher incidence of co-morbidity than in most other studies. Moreover, first year residents carried out most tonsillectomies, and in the literature haemorrhage rates were generally higher in patients operated upon by junior surgeons than those operated on by senior surgeons [15]. Because senior surgeons often intervene during the tonsillectomy to teach or help the junior surgeon, it was not possible to compare those two groups (without a bias).

This research data concerns a closed population. The Sophia Children's Hospital is a tertiary centre where all patients contact the Sophia children's hospital when complication occurs. A patient presenting to another hospital would be referred back to the Sophia Hospital for treatment of any complications. It is thus possible, but extremely unlikely, also considering the frequent co-morbidity of the patients that other hospitals would venture to treat Sophia Children's hospital's patients for a postoperative haemorrhage. It is likely that complications are lower still in a general hospital population, though this cannot be confirmed until further studies have been carried out, or a countrywide complications registry has been introduced.

This study did not make a direct comparison of two different groups (the Sluder group and the dissection group), because the

patient group undergoing the traditional dissection technique was small, and the dissection technique was mainly reserved for more difficult patients.

In recent years, studies have shown that the postoperative haemorrhage rate after tonsillectomy may vary per technique. The rate for primary haemorrhage varied from 0.6% (cold steel) [15] to 2.7% (monopolar diathermy dissection and haemostasis) [17]. The rate for secondary haemorrhage differed from 0.75% (cold dissection) [15] to 5.9% (monopolar diathermy dissection and haemostasis) [16]. The postoperative haemorrhages reported in this study were for primary haemorrhage 1.95%, and for secondary 0.28% when the Sluder method in combination with intubation was performed. This is the lowest secondary haemorrhage rate published lately, and may suggest the effectiveness of the Sluder method in combination with intubation in avoiding (secondary) haemorrhage.

In this study's patients group, zero patients received a blood transfusion. However, in the literature, the administered blood transfusions are between 0% and 0.52% [20,21]. Though the group is small, this may indicate a trend that the Sluder method in combination with intubation results in less blood loss than other techniques.

Though no serious major complications have been reported in recent years from hospitals using only mask anaesthesia without intubation, or even in hospitals where an intravenous canula is not routinely placed, we have little information about non-lethal complications. We do not condone these methods and it would certainly be considered as unsuitable for teaching purposes, as there is little time for removing the tonsils before the patient begins to wake up. Therefore, it is the Sophia Children's Hospital's policy to intubate all patients. Occasionally, the hospital also used laryngeal mask anaesthesia to good effect, but the numbers are too small to be analyzed separately. There is no consensus about this as there is no consensus about the use of intubation, or even the need for intravenous infusion.

The mortality rate reported by the central statistical agency (the CBS) in the Netherlands is extremely low, namely zero in the last 10 years. This institute gathers all mortality figures for the Netherlands. The literature presents figures of mortality between 1 out of 3000 and 1 out of 28,700 [22,23]. Despite the Netherlands' remarkably low mortality rates, there are other similar studies with a low mortality rate; for example, in Denmark no deaths were recorded between 1965 and 1975 after at least 150,000 (adenotonsillectomies) [24].

Limitations of this study include those inherent in a retrospective analysis. The study population consisted of patients referred to a tertiary care centre, and may therefore not fully represent a general population. However, it can only be expected, as explained previously, that a study at a non-tertiary centre results in even more favourable haemorrhage figures than this study presents.

There are no recent major studies where the Sluder method is compared to the cold steel dissection. Such studies will be necessary in order to analyze whether the Sluder method is better or worse than the traditional dissection.

5. Conclusion

In the vast majority of hospitals in the Netherlands, the Sluder method is still extensively applied in combination with the use of inhalation mask anaesthesia, with the patient in a sitting position, and without an intravenous infusion. This study further looked at the safety of the Sluder tonsillectomy method while the patient is intubated during the procedure. The study showed that the Sluder

tonsillectomy method in combination with intubation has a remarkably low incidence of primary and especially secondary haemorrhage, with most of the postoperative haemorrhage occurring within 6 h after the operation. When analyzing the complication rate for this possibly somewhat antiquated technique, this study resulted in the surprising finding that the intubated Sluder tonsillectomy appears to be as safe of safer than any other method in use today; especially in hospitals where it is used by relatively inexperienced surgeons, and therefore ideally suitable for day care surgery.

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