

Pain and bleeding are the main determinants of unscheduled contacts after outpatient tonsillectomy

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ABSTRACT

INTRODUCTION: The objective of this prospective cohort study was to measure the medical technical quality of outpatient tonsillectomy in Danish ear, nose & throat practices by indicators, standards and prognostic factors.

MATERIAL AND METHODS: According to standardised and validated specific questionnaires, quality of surgery was measured in terms of postoperative bleeding, pain, gastrointestinal problems and infection.

RESULTS: A total of 614 patients were included. 11% were younger than four years, and 93% were observed for less than four hours. A total of 23% had unscheduled postoperative contacts. Almost 12% of the patients contacted a physician due to pain; a percentage that exceeds the chosen standard of 10%. 4% were hospitalised due to bleeding exceeding the chosen standard of 1%. Secondary haemostatic procedures were performed in 2% of the patients. The indication chronic tonsillitis, being an adult, and a postoperative observation shorter than four hours increased the risk of unscheduled contacts.

CONCLUSION: Outpatient tonsillectomy seems safe in Denmark. A minimum postoperative observation period of four hours will reduce the need for postoperative contacts. Because of the potentially life-threatening risk related to tonsillectomy, careful patient selection is mandatory and continuous monitoring of the quality of the procedure is essential.

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At Danish ear-nose-throat (ENT) departments, approximately 7,000 annual tonsillectomies have traditionally been performed, either as inpatient or outpatient (one day without overnight stay) surgery (**Figure 1**). In the late 1990s, The National Danish Board of Health and the Danish Society of Otorhinolaryngology, Head and Neck Surgery (DSOHH) decided to transfer a number of elective tonsillectomies to practising ENT specialists to relieve the pressure on the hospital departments. The DSOHH board prepared national guidelines on outpatient tonsillectomy without post-surgery hospitalisation [1]. Furthermore, in collaboration with the Organisation of Danish Practising ENT specialists (DØNHO), a national indicator project (NIP) was designed to measure the medical technical quality of the surgical procedures per-

formed [1]. Thus, a number of clinical indicators (postoperative bleeding, pain, related gastrointestinal problems and pharyngeal infection) were identified through the international literature [2-19]. The indicators were measured by the number of patients having unscheduled contacts to doctors and/or hospitals. The respective standards were set to 10% and 1% for unscheduled contacts to doctors and hospitals, respectively, for each of the four indicators [4, 6, 7, 15, 19]. Finally, potential prognostic factors influencing the outcomes were identified: age, indication, pre-operative information, acute pharyngeal infection at the time of surgery, per-operative blood pressure and bleeding, postoperative analgesics, smoking habits, and length of postoperative observation [1-5, 7, 11, 12, 14, 17]. The aim of the present publication was to evaluate the results of the NIP with regard to the medical technical quality parameters associated with outpatient tonsillectomy in Danish ENT practices.

MATERIAL AND METHODS

The practising ENT specialists performing outpatient tonsillectomies were encouraged via the DØNHO to participate in the study according to national guidelines [1]. Only patients treated with bilateral complete tonsillectomy were included, whereas cases of tonsillotomy were excluded. Only cases where the tonsillectomy was performed in the clinic and without an overnight stay at the local hospital/patients hotel were accepted as outpatient cases. If the surgeons considered it necessary, both adenoidectomy and tonsillectomy were performed. Standardised and validated questionnaires were specified according to the clinical indicators and tested during a pilot study. The questionnaires were available to surgeons for download on DØNHO's homepage. Questionnaire 1 was filled in by the surgeons and included a follow-up visit 2-3 weeks after surgery at which unscheduled postoperative contacts to doctors and/or hospitals were registered. Questionnaire 2 was filled in by patients/parents and focused on unscheduled contacts.

During the inclusion period from March 2003 to March 2005, an extra fee was paid out to the practising ENT specialists for each patient included in the study.

Data reflecting the indicators and prognostic factors were retrieved from the questionnaires.

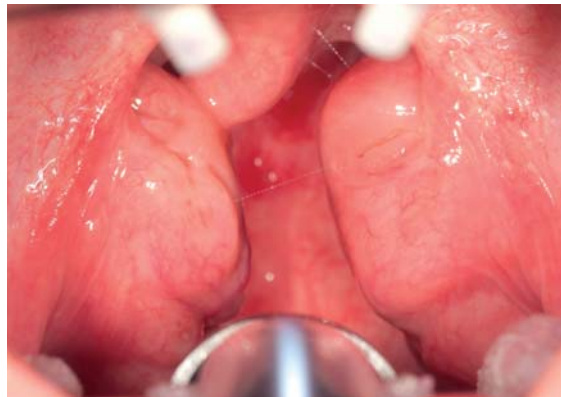
ORIGINAL ARTICLE

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 FIGURE 1

Hypertrophy of the tonsils causing mechanical and obstruction symptoms. Source: Tejs Ehlers Klug, ENT Department, Aarhus University Hospital.



To evaluate if the number of included patients was representative of all outpatient tonsillectomies in Danish ENT practices, The Public Health Services provided the total number of fees associated with tonsillectomy during the inclusion period.

Statistics

According to the a priori set levels for the standards of 1% and 10%, respectively, it was estimated that a minimum of 500 patients should be included. For statistical analyses, the χ^2 test was used with a significance level of 5%.

Trial registration: not relevant.

RESULTS

Study population

A total of 614 eligible patients were included in the study of whom 54% were females. The median age was eight years (1-49 years), 73% were children defined as patients younger than 16 years of age (11% were younger than four years), 8% were smokers and 9% suffered from other diseases (asthma, rhinitis and upper airway allergy). The most frequent diagnoses were hypertrophy of the tonsils and adenoids and combinations of two or more of the possible diagnoses (**Table 1**). The age of the groups with hypertrophy was lower than that of the other groups.

As presented in **Table 2**, the most prominent complaints were snoring, globoid voice, mouth breathing, mechanical problems during swallowing and apnoea (breathing pauses longer than ten seconds several times per night). Such mechanical/obstructive signs and symptoms occurred more frequently in children than in adults (15-61% versus 2.3-13%, $p < 0.0001$). Extreme and annoying fatigue during the daytime was experienced by 36%, and 18% reported falling asleep if not occupied. These symptoms were also more common among children than among adults (31% versus 6% and 15% versus 2%,

$p < 0.0005$. In the group of patients diagnosed with recurrent tonsillitis, 97% reported more than three episodes of acute tonsillitis per year. Tonsillitis was significantly more common among children than among adults (34% versus 16%, $p = 0.0114$). In the other diagnostic groups, most experienced less than two incidences of acute tonsillitis per year. As expected, more than three annual episodes of acute rhinitis was a significantly more common finding among the children than among the adults (44% versus 9%, $p < 0.0001$). 25% reported that their tonsillary disease had resulted in absence for more than two weeks from institutions etc. during the 12 months preceding tonsillectomy (**Table 2**).

Adeno-tonsillectomy was performed in 53% of the patients and 89% of these cases were children. The amount of per-operative bleeding was: 0-50 ml: 64%; 51-100 ml: 20%; 101-150 ml: 5%; 151-200 ml: 1.3%; and > 200 ml: 1.6%. 17% of the adults lost more than 100 ml blood during surgery compared with 4.8% of the children ($p < 0.0001$). The risk of a blood loss exceeding 100 ml was also significantly correlated with the diagnosis. Thus, in case of hypertrophy of the tonsils and adenoids treated with adeno-tonsillectomy, 26% lost more than 100 ml blood during surgery (26% versus 10-14%, $p < 0.0001$).

93% were observed for less than four hours, 37% for less than one hour (**Figure 2**). Three patients had a secondary haemostatic procedure in the clinic due to bleeding during the first few postoperative hours, and another three patients were transferred directly from the clinic to a hospital due to bleeding.

Indicators and standards

19% (118 patients) reported a least one unscheduled contact to a doctor (a general practitioner or an ENT specialist) (**Table 3**). Almost two thirds of these contacts (72/118) were due to pain, followed by gastrointestinal/eating problems and bleeding. Thus, unscheduled contacts due to pain (72/614, 11.7%) exceeded the standard of 10%. Ten of the 118 contacts (8.5%) gave rise to admission to a hospital due to bleeding.

A total of 44 patients (7.2%) were in contact with a hospital, primarily bleeding (29 patients, 66%) (**Table 3**). A total of 32 patients were hospitalized (5.2%), 25 due to bleeding. This frequency of 4.1% (25/614) is higher than the a priori set 1% standard. Secondary haemostatic procedures were performed in nine patients (1.5%). In addition, three patients had received a secondary haemostatic procedure in the clinic, thus a total of 12 patients (2.0%) had suffered from postoperative bleeding giving rise to secondary anaesthesia.

Due to an overlap between unscheduled contacts to doctors and hospitals, a total of 141 patients (23%) had post-operative contact to the health-care system.

The influence of prognostic factors on outcomes

No patients had clinical signs of pharyngeal infection at the time of tonsillectomy. Smoking, per-operative blood pressure and bleeding did not influence the number of unscheduled contacts ($0.1104 < p < 0.7909$).

Overall, adults had significantly more contacts than children: 31% versus 18% ($p = 0.0002$). The relative risk (RR) of an unscheduled contact was 17.0, 18.5 and 29.1 for the group younger than five years, the group aged 5-16 years, and the adult group, respectively. The RRs of hospitalization due to bleeding were 4.5, 1.1 and 7.0, respectively (notice the high RR among children younger than five years).

One third of patients with the diagnosis chronic tonsillitis had unscheduled contacts to doctors which is significantly more than the other diagnostic groups (33% versus 14-20%, $p < 0.010$).

Patients being observed for less than four hours had eight times more unscheduled contacts to doctors than those with a longer observation period (17% versus 2.2%, $p = 0.0149$).

DISCUSSION

The characteristics of the study population are typical for patients suffering from tonsillar diseases [14, 18]. Thus, two main groups can be identified: the young child with hypertrophy of the tonsils and obstructive symptoms and the adolescent/adult with recurrent or chronic tonsillitis.

Despite the extra fee, only 37% of the tonsillectomies performed in an ENT practice during the study period were included. Since the protocol and the questionnaires had been presented to all practising ENT specialists, it seems reasonable to assume that the extra effort and time related to the registration of data, obtaining informed consent etc. were the direct causes of this. Obviously, economic benefit was not a sufficient incentive for participation in the study. However, during the study period, an unknown number of tonsillectomies were performed in co-operation between ENT practices and ENT departments, which meant that these tonsillectomies did not fulfil the criteria for study inclusion (true outpatient cases). Thus, the total number of possible study patients should be reduced by this unknown number, i.e. the size of the study population exceeds the previously mentioned 37%. In addition, some ENT specialists might not have been aware of the project despite the information provided by the DØNHO. Nevertheless, the present study calls into question how quality measures comprising the entire patient population can be introduced in the future. Should economic compensation be even larger or should quality measurement be made compulsory?

The DSOHH recommendations with regard to age

TABLE 1

Diagnose/indication	Total number (%)	Median age (range), years
Chronic tonsillitis	64 (10)	22 (6-49)
Hypertrophic tonsils	92 (15)	5 (1-29)
Hypertrophic tonsils and adenoids	148 (24)	4 (1-25)
Recurrent tonsillitis	102 (17)	14 (3-47)
Combined diagnoses	208 (34)	9.5 (3-44)

Distribution of the various indications for tonsillectomy and the corresponding age.

TABLE 2

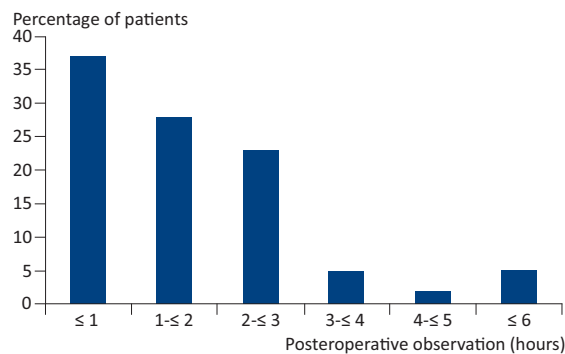
Symptom/sign	Yes	Unknown
Snoring	74	3.7
Globoid voice	53	7.6
Foetor ex ore	44	2.9
Mouth breathing	43	6.8
Disturbed swallowing	40	2.6
Extreme and annoying fatigue during the day	36	5.3
Apnoea	30	4.7
Rhinolalia clausa	30	6.5
Urge to clear the throat	29	7.8
Falling asleep if not occupied	18	4.4
Xerostomia	17	7.6
Lack of initiative	14	5.5
<i>Acute tonsillitis during the 12 months preceding tonsillectomy</i>	–	0.5
0 episodes	30	–
1-2 episodes	20	–
3-6 episodes	31	–
> 6 episodes	19	–
<i>Acute rhinitis during the 12 months preceding tonsillectomy</i>	–	2.1
0 episodes	6.8	–
1-3 episodes	40	–
4-6 episodes	30	–
> 6 episodes	21	–
<i>Absence from institution/school/work during the 12 months preceding tonsillectomy due to tonsillary disease</i>	–	2.1
0 days	34	–
1-3 days	9	–
4-7 days	11	–
8-14 days	18	–
> 15 days	25	–

Extracts from patient questionnaire are listed by the most frequent symptoms/signs including the incidences of acute tonsillitis and acute rhinitis during the 12 months preceding the tonsillectomy and including absence from institution, school or work. The values are percentages of the total number of patients (n = 614).

limit and length of observation in the clinic were not complied with. Thus, 11% of the patients were younger than four years. Although an inverse correlation was found between age and an aberrant course, one still has to bear in mind that tonsillectomy is a potentially life-threatening procedure and that observation of bleeding is rather difficult in infants [20]. This observation is further substantiated by our finding of an increased risk of hospitalization due to bleeding among children aged from one to four years.

FIGURE 2

Distribution of 614 tonsillectomized patients according to the length of postoperative observation.



The length of postoperative observation was considerably shorter than the recommended six hours as 93% of the patients were discharged within four hours. There was a significant correlation between early discharge and unscheduled contacts to doctors post-operatively; this was probably due to uncertainty about the expected symptoms and signs after surgery [15, 18, 19].

A total of 23% of the patients had unscheduled postoperative contacts: 19% and 7% had contacts to doctors or hospitals, respectively. For comparison, as many as 47% had unscheduled contacts in other studies and up to 30% of outpatients were hospitalised [2, 4-7]. With regard to each of the four indicators, the corresponding percentages of post-operative contacts are in accordance with previous reports about outpatient tonsillectomy in hospitals. Pain was the most frequent cause followed by bleeding, gastrointestinal problems and infection. Almost 12% of our patients had unscheduled contacts due to pain; thereby, the level exceeds the standard of 10%. The standard chosen was based on literature reports of 10-65% [2, 5, 7, 11, 12, 15, 18, 19].

The incidence of post-operative bleeding varies considerably in the literature [1, 14, 15, 18]. Between 0.5% and 5% are re-admitted due to bleeding, and secondary haemostasis is performed in 0-12% [2, 4, 5, 14-16, 18]. However, several of these studies also included acute tonsillectomies which are associated with an increased risk. Generally, the bleeding incidence tends to be low in case of outpatient surgery due to careful selection of the patients with the lowest risks [2-8]. In our study, 4.1% were hospitalised due to bleeding, and 2% had secondary surgery. Consequently, the chosen 1% standard was exceeded by 3.1%.

The incidences of gastrointestinal problems and pharyngeal infection are within the range found in other studies and within the chosen standards [2, 6-8, 10, 13, 15].

In contrast with previous results, we found no case mix due to the per-operative blood pressure/bleeding

TABLE 3

Percentage of patients with unscheduled contacts to a doctor (general practitioner or an ear, nose and throat specialist) as well as the percentage of patients being admitted to a hospital after discharge from the clinic for each of the chosen indicators. For comparison, the a priori chosen standards are shown in parenthesis after the indicators in the left column (n = 614).

Indicator (standard %)	% of patients
<i>Bleeding</i>	
Unscheduled contact to a doctor (10)	3.0
Contacts to hospital (1)	4.7
Hospitalisation	4.1
Secondary haemostatic procedure	2.0
<i>Pain</i>	
Unscheduled contact to a doctor (10)	11.7
Contacts to hospital (1)	0.65
<i>Fever (infection)</i>	
Unscheduled contact to a doctor (10)	1.95
Contacts to hospital (1)	0.33
<i>Nausea/vomiting/swallowing</i>	
Unscheduled contact to a doctor (10)	2.44
Contacts to hospital (1)	0.33
<i>Other reasons</i>	
Unscheduled contact to a doctor	1.63
Contacts to hospital	0.65
<i>Total</i>	
Unscheduled contacts	19.2
Contacts to hospital	7.2
Hospitalisations	5.2

and smoking [14, 17]. The reasons for these discrepancies are inclusion of acute tonsillectomies performed by less experienced surgeons [14]. The smoking habits also only influenced the risk of bleeding in case of simultaneous uvulopalatopharyngoplasty [17].

In contrast to other reports, the patients' age was inversely correlated with unscheduled contacts to doctors and/or hospitals [14, 16]. However, these other reports included acute tonsillectomies due to peritonsillar abscesses, which is itself a risk factor for post-operative bleeding. Furthermore, parents might have underestimated pain among their children in the present study which would result in a decreased tendency to contact the health care system [12, 18, 19].

Chronic tonsillitis was associated with significantly more contacts to doctors compared with the other diagnostic groups, especially because of pain. It is probable that a large degree of adherences to the adjacent tissue and more extensive use of electro-cautery were the underlying factors causing these contacts.

CONCLUSION

It is possible to monitor the medical technical quality of outpatient tonsillectomy in ENT practices by means of the principles of the NIP. However, only 37% of the total

number of tonsillectomies was included, and further investigation of the reasons for this is needed. The main causes of unscheduled post-operative contacts to the health care system were pain and bleeding. The indications chronic tonsillitis, being an adult and short post-operative observation were significantly associated with an elevated number of contacts. Consequently, the minimum observation period should be four hours. A telephone call/visit to the patients after three to seven days may be introduced [18]. More detailed and differentiated information to the patients addressing the specific diagnostic and age groups may reduce the need for contacts. It is also recommended to comply with the minimum age limit of four years for outpatient tonsillectomy.

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CONFLICTS OF INTEREST: none

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