

## ORIGINAL RESEARCH

# Hemorrhage Risk After Quinsy Tonsillectomy

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**BACKGROUND:** The goal of the study was to evaluate the incidence and possible predictive factors of post-tonsillectomy hemorrhage (PTH) in patients with peritonsillar abscess, treated by acute abscess tonsillectomy.

**METHODS:** A retrospective cohort study was performed on 205 patients who underwent bilateral abscess tonsillectomy under general anesthesia. Age, sex, smoking habits, history of recurrent tonsillitis or prior peritonsillar abscess, current medical treatment, side of the peritonsillar abscess, initial treatment, surgeon's experience, procedure duration, intra- and postoperative anti-inflammatory medications, and side of bleeding were analyzed.

**RESULTS:** Bleeding occurred in 27 patients (13%). Ipsilateral hemorrhage was observed in 8 patients (4%) and contralateral hemorrhage in 19 patients (9%). The higher incidence of PTH in the side contralateral to the abscess was found to be statistically significant ( $P = 0.02$ ). Male gender ( $P = 0.042$ ), smoking ( $P = 0.009$ ), and aspirin intake ( $P = 0.008$ ) were statistically significant factors associated with an increased PTH risk.

**CONCLUSION:** The risk of bleeding following abscess tonsillectomy seems higher than reported in elective tonsillectomy. This high incidence is mainly due to patients with prior aspirin intake or to bleeding in the side contralateral to the abscess. Postoperative bleeding could be reduced by performing a unilateral acute abscess tonsillectomy in selected patients. An algorithm is proposed for the management of peritonsillar abscess based on age, prior history of pharyngo-tonsillar infections, aspirin intake, and clinical improvement after initial drainage and antibiotherapy.

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Quinsy or peritonsillar abscess (PTA) is the most common head and neck abscess.<sup>1</sup> It is usually a complication of pharyngo-tonsillitis and its incidence is estimated at 30 cases per 100,000 inhabitants per year.<sup>2</sup> Various options have been proposed for the acute treatment of PTA, includ-

ing intravenous antibiotics alone, needle aspiration, incision & drainage, or acute abscess tonsillectomy.<sup>1,2</sup> While several studies show a comparable efficacy in PTA treatment with needle aspiration or incision & drainage (see <sup>1</sup> and <sup>2</sup> for a review), there is a lack of concrete criteria to select the optimal treatment for PTA. Compared to other treatment strategies, acute abscess tonsillectomy (also known as quinsy tonsillectomy) has the advantage of immediate and definitive remedy of the abscess and is associated with an almost absent risk of abscess recurrence.

In his exhaustive review on the subject, Herzon<sup>2</sup> found the incidence of recurrent PTA to vary between 0% and 22%, with an average of about 12%. Herbild and Bonding<sup>3</sup> concluded that recurrent PTA and tonsillitis are more common if patients were younger than 40 years at the time of the initial PTA. In addition, a history of prior recurrent tonsillitis was associated with a higher recurrent PTA rate. Using a slightly different age cut-off, Nielsen and Greisen<sup>4</sup> found similar results: 63% of patients younger than 30 years had recurrent PTA or tonsillitis, while only 12% of patients older than 30 years had similar problems after the initial treatment of PTA by incision & drainage.

Following a previous study in our institution,<sup>5</sup> the treatment modalities for PTA in our department were changed following the treatment algorithm published by Marchal et al.<sup>5</sup> Because of the previously cited studies,<sup>3,4</sup> we chose an age of 35 years as a cut-off for PTA as an indication for tonsillectomy. Patients younger than 35 years, with at least 2 annual episodes of acute tonsillitis or at least 1 previous episode of PTA, have been undergoing an acute abscess tonsillectomy. Patients without history of tonsillitis or peritonsillar abscess and patients older than 35 years were treated with needle aspiration and/or incision & drainage of the PTA, followed by intravenous antibiotherapy. If no

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clinical improvement was noted after 48 hours of this treatment regimen, abscess tonsillectomy was performed.

In order to evaluate the suitability of this protocol we reviewed our experience with acute abscess tonsillectomy during the last 9 years with specific attention to post-tonsillectomy hemorrhage (PTH). The primary goal of this study was to evaluate the incidence of PTH and to identify potential risk factors of PTH in abscess tonsillectomy. This analysis should provide tools to identify patients with increased PTH risk and help avoid quinsy tonsillectomy in these patients.

## PATIENTS AND METHODS

### Inclusion Criteria

We retrospectively analyzed the medical records of all patients who underwent a quinsy tonsillectomy for PTA in our department between January 1, 1995 and December 31, 2003. We identified a total of 215 patients. In 10 patients a unilateral abscess tonsillectomy was performed for medical reasons and these were excluded from this study. For the remaining 205 patients with bilateral tonsillectomies for PTA, complete data were available, from the day of admission to the last follow-up examination, usually about a month after hospital discharge.

### Treatment Protocol

All patients were admitted for intravenous antibiotic administration before surgery, usually penicillin, amoxicillin/clavulanic acid, or clindamycin if an allergy to penicillin was known. Oral antibiotic treatment was continued for at least 10 days after surgery. Otorhinolaryngology residents or attendings performed all surgical procedures. Patients received general endotracheal anesthesia with tonsillar exposure by a Davis-Boyle mouth gag. A low-dose peritonsillar injection of carbosthesine-epinephrine was performed prior to incision. All surgeons used the technique of bipolar electro-dissection. Patients were kept in the hospital for surveillance at least 24 hours after surgery. All patients were checked in the outpatient clinic at least once 10 days postoperatively. All patients were advised to consult the emergency department immediately in case of any kind of oral bleeding. Every postoperative consultation for any hemorrhage event was considered as a PTH.

### Factors Analyzed

The following factors were analyzed of every patient's chart:

Preoperative factors: age, sex, smoking habits, history of recurrent tonsillitis, history of previous PTA, current medical treatments including the unique preoperative drug intake (nonsteroidal anti-inflammatory drugs [NSAID], aspirin, antibiotics), initial treatment (antibiotic therapy, needle aspiration, incision & drainage, quinsy tonsillectomy), preoperative body temperature, preoperative coagulation

values, preoperative systolic and diastolic arterial blood pressure.

Intraoperative factors: surgeon's experience (attending or resident), procedure duration, anti-inflammatory treatment (Ketorolac), side of peritonsillar abscess.

Postoperative factors: anti-inflammatory treatment.  
The day the postoperative hemorrhage occurred.

### Statistical Analysis

Analysis compared patients with postoperative bleeding events (PTH) and those without bleeding events. Results were analyzed using SPSS 11.0 for Windows (SPSS Inc., Chicago, IL, USA). Descriptive statistics are presented within the body of text as means  $\pm$  SEM. T tests for unpaired samples were employed for comparisons between groups. For correlations, Spearman analyses were performed. Analyses of frequencies were calculated using  $\chi^2$  tests. The alpha level was set at 0.05.

## RESULTS

### Patients

A total of 205 patients (96 males, 109 females; mean age:  $26.8 \pm 1.4$  years) underwent quinsy tonsillectomy and met the criteria for this study. Most of the patients had a unilateral tonsillar abscess (95%). Bilateral abscesses were found in 11 patients (5%).

*Hemorrhage incidence.* Twenty-seven patients (13%) experienced PTH with a total of 36 bleeding episodes. No patient with a bilateral peritonsillar abscess had a PTH. One patient (0.5%) developed primary hemorrhage during the first 24 hours postoperatively, and 26 (12.5%) developed a secondary hemorrhage, defined as occurring at least 24 hours after surgery.

*Hemorrhage side.* In 8 patients (4%), hemorrhage was observed on the side of the abscess (ipsilateral); in 19 patients (9%), on the contralateral side. The higher incidence of PTH of the contralateral side with respect to the abscess was found to be statistically significant ( $\chi^2$  test,  $P = 0.02$ ).

*Hemorrhage day.* PTH occurred most commonly on postoperative day 5 (7/27), followed by days 6 (4/27) and 8 (4/27). One patient presented a delayed postoperative bleeding as late as 18 days after surgery.

*Repetitive hemorrhage.* Twenty-two patients were evaluated once for hemorrhage, and in 5 of the 27 patients (19%) multiple bleeding episodes occurred. Three patients had 2 episodes, and 2 patients had 4 episodes of bleeding.

*Hemorrhage treatment.* All 27 patients who experienced PTH were readmitted to the hospital for at least 24 hours of observation. Thirteen required a return to the operating

room for hemostasis under general anesthesia (electro-cauterization, 7 patients; suturing of the tonsillar fossa, 5 patients; embolization of the pharyngeal ascending artery, 1 patient). Of the remaining 14 patients, 6 underwent cauterization under local anesthesia and 8 patients were admitted for observation only (eg, rehydration, observation, ice collars with cold packs). No blood transfusions were needed and no lethal PTH occurred.

### Factors Associated With an Increased PTH Risk

Comparing patients with PTH and those without PTH, several factors were identified as associated with an increased risk of a postoperative bleeding episode (Table 1).

**Gender.** Significantly more men (67%, 18 men) than women (33%, 9 women) presented a PTH. In the group without PTH the gender distribution was almost equal (78 men, 100 women; 44% vs 56%). Analysis revealed male gender to be significantly related to PTH occurrence ( $\chi^2$  test,  $P = 0.042$ ).

**Smoking habits.** Smokers (15 patients, 65%) were more prone to present PTH episodes compared to nonsmokers (12 patients, 35%). In the group without PTH only 31% (55 patients) smoked while 69% (122 patients) were nonsmokers. Statistical analysis revealed smoking to be a factor associated with a significantly increased risk of PTH ( $\chi^2$  test,  $P = 0.009$ ). Since more men smoke, we checked for respective interferences of gender (see above) and smoking habits. These analyses still revealed a significant increase in PTH risk for both factors, smoking and male gender.

**Aspirin intake.** Preoperative aspirin intake was noted in 40 patients and 11 of these (27.5%) presented a PTH, while only 16 of 165 (9.7%) patients not taking aspirin had a PTH. Thus preoperative aspirin intake, even in unique doses, was found to be associated with a significantly higher incidence of PTH ( $\chi^2$  test,  $P = 0.008$ ).

Most variables we evaluated did not show any effect on PTH rate. Patient's age, history of recurrent tonsillitis and previous PTA, preoperative pathologic coagulation values, current treatments, initial treatment, preoperative body temperature, preoperative systolic and diastolic arterial blood pressure, surgeon's experience, procedure duration, intraoperative anti-inflammatory treatment, and postoperative anti-inflammatory treatment were all not associated to higher PTH rates (Table 2).

## DISCUSSION

The main findings of the present study were 1) that quinsy tonsillectomy has a slightly higher PTH rate compared to the PTH rate after elective tonsillectomy,<sup>6-9</sup> and 2) that aspirin intake, male gender, and smoking were associated with this increased PTH rate. Further, the contralateral side of the abscess was found to be more often the side of PTH.

The definition of PTH varies among studies, with some studies reporting all PTH, some focusing on hospital readmissions, and some including only PTH requiring reoperation under general anesthesia. Regarding elective tonsillectomy for any condition, the data cover a wide range, but reasonable rates for readmissions seem to be between 0% and 7.8% and for reoperations between 0% and 3.8%.<sup>6-9</sup>

In contrast to elective tonsillectomy, large series (reporting at least 100 patients) on PTH after quinsy tonsillectomy are rather rare (Table 3). High rates of PTH were reported by Dünne et al,<sup>10</sup> with an incidence of 25% for hospital readmission. In this study, surgery under general anesthesia was necessary for hemostasis in 11%<sup>10</sup> of the cases. Several other reports,<sup>11-15</sup> including the largest series by Windfuhr and Chen,<sup>16</sup> find low PTH rates, in the range of those found in elective tonsillectomy.

The present study included all postoperative readmissions to the hospital due to bleeding events, even if the therapy was nonsurgical. Among the 27 patients (13%) with PTH, 14 patients (7%) required only observation or cauterization in the clinic, while 13 subjects (6%) required a reoperation under general anesthesia. These rates are in the high range of previous publications on bleeding after quinsy tonsillectomy (Table 3) and well above those after elective tonsillectomy. This finding prompted us to examine possible factors that might contribute to this complication.

We found a weak association between male gender and PTH, with an incidence of 8.7% in males and 4.3% in females ( $P = 0.042$ ). Similar observations were found in previous studies on tonsillectomies.<sup>6,16</sup> The male gender effect might result from a less strict following of the postoperative instructions regarding rest and diet.

Smoking was found to significantly increase the risk of a PTH ( $P = 0.009$ ). To our knowledge no large series examined the effects of smoking habits on the incidence of PTH. Smoking, which is known as a potent trigeminal irritant,<sup>17</sup> possibly increases the inflammatory reaction in the already

**Table 1**  
Factors associated with an increased risk of bleeding after acute abscess tonsillectomy

	Hemorrhage n = 27	No Hemorrhage n = 178	P value ( $\chi^2$ test)
Sex			
Male	18 (67%)	78 (44%)	0.042
Female	9 (33%)	100 (56%)	
Smoking habits			
Smokers	15 (65%)	55 (31%)	0.009
Nonsmokers	12 (35%)	122 (69%)	
Aspirin intake			
Yes	11 (41%)	29 (16%)	0.008
No	16 (59%)	149 (84%)	

**Table 2**  
**Factors not associated with an increased risk of bleeding after acute abscess tonsillectomy**

	Hemorrhage n = 27	No hemorrhage n = 178	P value ( $\chi^2$ test)
Age (years)			
Mean (SEM)	26.9 (1.8)	26.4 (0.9)	0.8
Range	9–43	4–65	
History of recurrent tonsillitis	11 (41%)	90 (51%)	0.7
History of previous PTA	4 (15%)	56 (31%)	0.6
Abnormal coagulation values	7 (26%)	52 (29%)	0.8
Current medications: NSAID	5 (19%)	40 (22%)	0.8
Current medications: antibiotics	17 (63%)	82 (46%)	0.2
Preoperative temperature (°C)			
Mean (SEM)	37.5 (0.2)	37.7 (0.09)	0.2
Initial PTA treatment			
Antibiotics & observation	10 (37%)	48 (27%)	0.5
Needle aspiration	4 (15%)	31 (17%)	0.7
Incision & drainage	2 (7%)	32 (18%)	0.5
Quinsy tonsillectomy	11 (41%)	67 (38%)	0.7
Surgeon's experience			
Attendings	14 (52%)	103 (58%)	0.5
Residents	13 (48%)	75 (42%)	
Procedure duration (min)			
Mean (SEM)	53 (4.0)	49 (1.3)	0.3
Range	25–120	20–135	
Ketorolac (intraoperative)	10 (37%)	58 (33%)	0.8
Postoperative NSAID	26 (96%)	168 (94%)	0.6

inflamed tonsillar beds, leading to an increased local blood flow.

Preoperative aspirin intake (single or repeated doses) was found to be significantly increasing the risk of PTH ( $P = 0.008$ ). Although aspirin intake is a clear contraindication for any elective surgery, quinsy tonsillectomy is an emergency operation that could not be postponed for a week, necessary for its effect to subside. Interestingly, the observed aspirin effect was rarely in patients taking aspirin for cardiovascular indications. Most patients had consumed aspirin in the previous days for the treatment of “sore throat.” In our country, galenic formulas associate acetylsalicylic acid with other compounds and are sold over the counter as a swish-and-swallow solution. Furthermore, gen-

eral practitioners often prescribe these formulas for “sore throat,” which might be the initial presentation of PTA.

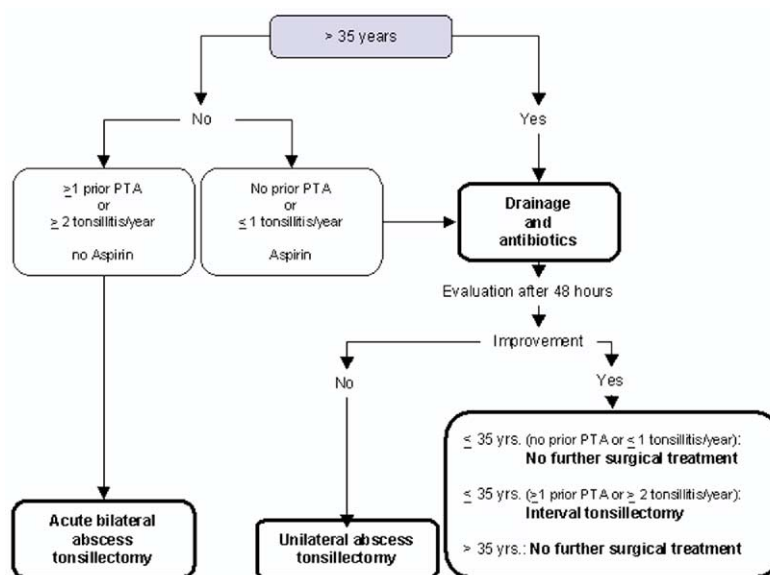
Other preoperatively-taken NSAIDs did not show any significant increase of the PTH rate in our study. However, a recent meta-analysis on the effect of postoperative NSAIDs on bleeding tendency demonstrated a weak but significant increase in the PTH rates following elective tonsillectomy.<sup>18</sup>

Probably the most interesting finding of the present study is that PTH occurred more often on the side opposite to the PTA. In only 8 patients (4%) the hemorrhage was ipsilateral to the abscessed tonsil, while in the remaining 19 patients (9%) the bleeding was on the contralateral side. The higher bleeding rate on the contralateral side might be explained by

**Table 3**  
**Studies reporting postoperative bleeding after quinsy tonsillectomy**

Source	Year	Sample size	PTH incidence (%)	PTH requiring surgery (%)
Bateman et al <sup>11</sup>	1959	120	2.5	0
Beeden et al <sup>12</sup>	1970	100	5	1
Bonding <sup>13</sup>	1973	317	4.9	2.6
Templer et al <sup>14</sup>	1977	119	1.7	NA
Suzuki et al <sup>15</sup>	1999	103	0	0
Windfuhr et al <sup>16</sup>	2001	1481	NA	2.9
Dünne et al <sup>10</sup>	2003	142	25	11
Present study	2005	205	13	6

NA, not available.



**Figure 1** Algorithm for the management of peritonsillar abscess.

the fact that abscess tonsillectomy is technically easier than the tonsillectomy of the contralateral side. The PTA provides a plane of dissection whereby the contralateral tonsil is acutely inflamed and infected, with blurring of the peritonsillar dissection plane. Other reports also showed a tendency to a higher incidence of PTH in the unaffected side,<sup>11,19</sup> whereas Dünne et al<sup>10</sup> observed the contrary. The role of previous infections, such as previous PTA or chronic and recurrent tonsillitis, on the incidence of PTH in elective tonsillectomy remains debatable. Increased risk for PTH in acute abscess tonsillectomy compared to noninfectious indications of tonsillectomy, like tonsillar hypertrophy, was found by Windfuhr and Chen,<sup>6</sup> while others failed to find such an association.<sup>10,20</sup>

While most factors associated with an increased risk for PTH are beyond the surgeon's control, performing quinsy tonsillectomy only on the abscessed tonsil might result in lower PTH rates. In the present study, PTH occurred in the contralateral side or in patients with prior aspirin intake in 23 cases. If tonsillectomy is only performed ipsilaterally and if patients with aspirin intake are excluded, the PTH rate is 2%. This rate is at the low range of PTH after elective tonsillectomy.

Sørensen et al<sup>21</sup> demonstrated that the recurrence rate of PTA and acute tonsillitis in the remaining tonsil was not increased after unilateral tonsillectomy for PTA in patients older than 30 years. Similar results were demonstrated by Christensen and Schönsted-Madsen.<sup>22</sup> Other studies indicate that patients with PTA, younger than 25 to 40 years, exhibit a twofold to fourfold increased risk of PTA recurrence when compared to older patients, if they have a prior history of recurrent pharyngo-tonsillar infections.<sup>4,23</sup> Thus, unilateral tonsillectomy potentially could be considered in patients over 35 years who show no clinical amelioration despite drainage and intravenous antibiotherapy.

Although age has been reported as a risk factor for PTH after elective tonsillectomy,<sup>6,8,16</sup> our data did not find such an association. A possible explanation is the fact that, in our institution, quinsy tonsillectomy was considered mainly in patients younger than 35 years.<sup>5</sup> Therefore, our results suggest indirectly that age beyond 35 years might be a factor for PTH after quinsy tonsillectomy. Furthermore, considering the two lethal PTH cases observed in patients over 70 years by Dünne et al,<sup>10</sup> advanced age might be a contraindication for quinsy tonsillectomy.

The current debate on the ideal treatment of PTA depends upon several factors. A randomized study<sup>24</sup> comparing quinsy tonsillectomy and interval tonsillectomy "à froid" has concluded to a shorter hospital stay and fewer days lost from work with quinsy tonsillectomy. Pain duration and health costs are logically lesser with quinsy tonsillectomy.<sup>5</sup> Therefore, a definitive treatment of the PTA during the acute episode would be advantageous.

The high incidence of PTH and the data of the present study lead us to propose a slightly modified treatment algorithm (Fig 1). The factors involved in the treatment decision include the patient's age, the prior history of PTA or recurrent tonsillitis, aspirin intake, and the observed improvement after drainage and intravenous antibiotherapy. Bilateral quinsy tonsillectomy is offered to patients younger than 35 years, with prior infectious tonsillar episodes and without aspirin intake. In patients older than 35 years, or without prior history of tonsillar infections, or with aspirin intake, a needle aspiration or incision & drainage is performed and the patient given intravenous antibiotics. If no improvement is observed after 48 hours a unilateral quinsy tonsillectomy is performed. Improved patients are considered for bilateral elective tonsillectomy only if younger than 35 years and

if they have a history of a previous PTA or at least 2 episodes of tonsillitis per year.

## CONCLUSION

Patients undergoing quinsy tonsillectomy for peritonsillar abscess have an incidence of postoperative bleeding of 13% and a reoperation rate for hemostasis of 6%. This incidence is higher compared to postoperative bleeding after elective tonsillectomy. However, this high incidence is mainly due to patients who were operated despite a prior aspirin intake. In addition, two-thirds of the bleeding episodes occurred in the side contralateral to the PTA. An algorithm is proposed for the management of peritonsillar abscess based on age, prior history of tonsillitis or PTA, aspirin intake, and clinical improvement after initial drainage and antibiotherapy.

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