

POST-TONSILLECTOMY HAEMORRHAGE: A RETROSPECTIVE COMPARISON OF ABSCESS - AND ELECTIVE TONSILLECTOMY

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ABSTRACT

Objective: There is still controversy as regards the optimal management of peritonsillar abscess. Opponents of tonsillectomy á chaud cite an increased postoperative bleeding risk. Most authors who compared the risks of postoperative haemorrhage after tonsillectomy á chaud and tonsillectomy á froid did not take into consideration criteria such as the age and gender of the patients or the experience of the surgeon. We aimed to eliminate this bias by performing a retrospective study in which a large series of abscess tonsillectomies were compared with an age- and gender-matched group of elective tonsill. **Material and methods:** All patients had been operated on at the Department of Otorhinolaryngology, "Sv. Marina" University Hospital, "Prof. P. Stoyanov"- Varna University of Medicine 1994 and August 2000. There were 350 patients in the abscess tonsillectomy group (61% male, 39% female; mean age 31.8 years; range 3-88 years) and 311 in the elective tonsillectomy comparison group (61% male, 39% female; mean age 30.0 years; range 2-83 years). **Results:** In the abscess tonsillectomy group, 9 patients (2.6%; confidence level 1.1-4.8%) had postoperative haemorrhages which required treatment under general anaesthesia, compared to 17 (5.5%; confidence level 3.2-8.6%) in the age- and gender-matched group of "selected" elective tonsillectomies. The difference between these two rates was not significant ($p=0.056$). The fairly high rate of haemorrhages in the elective tonsillectomy group was mainly due to the effect of the age-matching procedure, which excluded a considerable number of usually unproblematic tonsillectomies for tonsillar hyperplasia in young children. Moreover, our results show that there is a learning curve for surgeons performing tonsillectomies with regard to postoperative haemorrhages. **Conclusion:** There is no increased risk of postoperative haemorrhage for abscess tonsillectomies in comparison to elective tonsillectomies.

Keywords: abscess, tonsillectomy, postoperative haemorrhage

INTRODUCTION

Peritonsillar abscess (PTA) is the commonest deep infection of the head and neck. It occurs most often in older children and young adults (1). Insufficiently treated abscesses may penetrate into the parapharyngeal space and either downwards to the mediastinum or upwards to the base of the skull (2) Sepsis, dyspnoea and other life-threatening dangers may follow.

There is controversy regarding the optimal management of PTA. The two major therapeutic strategies are immediate tonsillectomy (tonsillectomy á chaud) or incision and drainage of the abscess followed by tonsillectomy á froid 6-12 weeks later (3) Contradictorily, both approaches have been associated with the highest postoperative haemorrhage rate (4) There are only a few prospective studies (5,6) comprising a small number of cases in which postoperative haemorrhage rates have been compared between the two strategies.

Retrospective studies of large series of abscess tonsillectomies have used "normal" tonsillectomies (and not tonsillectomies á froid) as controls and have not taken epidemiological factors such as age, gender or smoking habits into consideration. (Young children operated on for simple tonsillary hyperplasia rarely suffer complications in our experience.) We aimed to eliminate this bias by using similar control groups. In addition we investigated surgical experience as a potential risk factor for a postoperative haemorrhage.

MATERIAL AND METHODS

We retrospectively compared a group of 350 abscess tonsillectomies performed in our department between March 1994 and August 2000 with a group of elective tonsillectomies performed over the same time period, matching patients for age, gender and smoking habit. Owing to the limited number of elective tonsillectomies a 1:1 match for the three variables could not strictly be performed. Despite this

fact the two groups were statistically comparable concerning age, gender and smoking habits. Further variables which were not used as criteria for the matching procedure are listed below. Tumour tonsillectomies were excluded. The patients in the abscess group (61% male, 39% female) had a mean age of 31.8 years (range 3-88 years) and 55% were smokers. In the comparison group of 311 elective tonsillectomies (61% male, 39% female), the mean age was 30.0 years (range 2-83 years) and 50% were smokers. Data regarding the occurrence of postoperative haemorrhage and the experience of the surgeons (number of years of ENT training) were sought by reviewing the patients' medical records.

In both groups tonsillectomy was performed using blunt dissection under general anaesthesia (GA). Haemostasis was achieved with bipolar electrocoagulation close to the tonsillar capsule. Ligature was only performed if bleeding occurred from visible arterial vessels or larger vessels. In patients regarded as having a high risk of haemorrhage, e.g. those with hepatic insufficiency, we stitched the palatopharyngeal to the palatoglossal arch, but never on the abscess side.

Beside the total number of bleeding events postoperative haemorrhage like in most publications was defined as bleeding that required a return to theatre and an intervention under GA. Furthermore, we distinguished between primary (<24 h) and secondary (>24 h) bleeds. Haemorrhage rates were statistically analysed using confidence levels (CLs) or the [chi]² test.

RESULTS

Incidence of postoperative haemorrhage Performing abscess tonsillectomy did not result in an increase in postoperative haemorrhage. In fact, our data suggest that the risk of postoperative haemorrhage in this group was reduced ($p=0.056$). Of the 661 tonsillectomies, there were no cases of haemorrhage that required ligature of the external carotid artery or embolization.

Abscess tonsillectomy

Of the 350 patients who underwent abscess tonsillectomy, 28 (8%) had documented postoperative haemorrhage: 6/28 of these patients (21%) had recurrent haemorrhage, 5/28 patients bled twice and 1 patient bled 4 times, making a total of 36 bleeding events. Of the 28 patients who experienced postoperative haemorrhage, 9 needed an intervention under GA (9/350; 2.6%). Three haemorrhages occurred on the abscess side, four on the contralateral side and in one patient haemorrhage occurred on both sides. In one case the bleeding side was not documented.

Elective tonsillectomy

Of the 311 patients who underwent elective tonsillectomy, 36 (11.6%) had postoperative haemorrhage: 8/36 of these patients (22%) had recurrent haemorrhage, 5 patients bled twice, 2 patients bled 3 times and 1 patient bled 4 times,

making a total of 49 events. GA was necessary in 19/49 cases of haemorrhage to arrest bleeding (17/311; 5.5%).

Time of occurrence of the postoperative haemorrhage The incidence of postoperative haemorrhage within the first 24 h (primary haemorrhage) was comparably rare in both groups: abscess tonsillectomy, 3/36 (8.3%; CL 1.8-22.5%); elective tonsillectomy, 5/49 (10.2%; CL 3.4-22.2%). In both groups there were significantly more secondary (>24 h) than primary haemorrhages.

Abscess tonsillectomy Postoperative haemorrhages occurred between the day of operation and the 21st postoperative day, with a maximal incidence of 9 cases on the 6th postoperative day; 18/36 haemorrhages occurred after postoperative Day 6 (50%). Thus 9 cases, or just 25% of bleedings, happened within the first five postoperative days.

Elective tonsillectomy

All haemorrhages took place between the day of operation and the 19th postoperative day, with a maximum of 6/48 cases on the 5th postoperative day; 23/48 bleeding events (47%) were seen between postoperative Days 5 and 9 and >60% after the 5th postoperative day.

Influence of age and gender on postoperative haemorrhage The median age of patients who developed postoperative haemorrhage was 28 years; for those who required GA it was 25 years. For patients aged <16 years only 1/92 (1.1%; CL 0.03-5.9%) had a haemorrhage that required treatment under GA. For patients aged >16 years, 25/569 (4.4%; CL 2.9-6.4%) had to be treated under GA. The binomic CLs underline a general tendency that patients aged <16 or even <20 years of age have a smaller risk of a postoperative haemorrhage. After abscess tonsillectomy, 6/214 (2.8%; CL 1.0-6.0%) male and 3/136 (2.21%; CL 0.5-6.3%) female patients had a postoperative haemorrhage, compared to 11/190 (5.8%; CL 2.9-10.1%) male and 6/121 (4.4%; CL 1.6-7.9%) female patients after elective tonsillectomy. Among all 661 operations, 17/404 (2.8%; CL 1.0-6.0%) male and 9/257 (3.5%; CL 1.6-6.5%) female patients had a haemorrhage. There were 13 smokers and 13 non-smokers among the 26 patients who experienced severe bleeding and the overall incidence of smoking in the study population was 53%. Experience of the surgeons Elective tonsillectomy was predominantly performed by trainees in their 1st year of ENT specialization (101/311 cases; 32.5%) and abscess tonsillectomy by those in their 2nd year (93/350 cases; 26.6%). Patients who were operated on by trainees in their first and second years of ENT specialization had significantly more bleedings (4.2%; CL 1.7-8.5%) as a result of abscess tonsillectomies than those operated on by more experienced trainees (1.1%; CL 0.1-3.9%). There was no significant difference between trainees in their first and second years concerning bleedings after abscess (4.2%) and elective tonsillectomies (5.1%).

Efficiency of prophylactic techniques

As mentioned above, we stitched the palatopharyngeal to the palatoglossal arch if an increased risk of a postoperative

haemorrhage was predicted. This was done in 54/311 patients (17.4%), 9 of whom had postoperative bleeding. A total of 3/54 cases (5.6%) needed treatment for haemorrhage under GA.

Predisposing factors
Abscess tonsillectomy A total of 19/350 patients (5.4%) were taking anticoagulant medication when admitted for PTA (aspirin, n=18; coumarin, n=1); 4/19 (21%) of these had postoperative haemorrhage, 2 of whom required GA. Two patients suffered from arterial hypertension, one of whom developed haemorrhage requiring GA.
Elective tonsillectomy A total of 14/311 patients (4.5%) were taking anticoagulants, which were discontinued prior to the operation; 4/14 (29%) of them presented with haemorrhage, 1 of whom required GA. Previous medical conditions for this patient group included malignant haematological diseases (chronic lymphatic leukaemia), n=2; arterial hypertension, n=7; and hepatic insufficiency (pre-liver transplantation), n=4. None had known bleeding tendencies. Only 2 of these 13 high-risk patients bled postoperatively, 1 of whom had to be treated under GA.

DISCUSSION

The incidence of postoperative haemorrhage after tonsillectomy has been reported to range between 2% and 3.5% (7-12). There is still controversy regarding the rate of postoperative bleeding after abscess tonsillectomy. There have been no randomized prospective studies with large enough samples in which tonsillectomy *á chaud* was compared with tonsillectomy *á froid* with regard to the risk of a postoperative haemorrhage. In our department, the abscess tonsillectomy has been standard practice for many years and we are convinced of its benefits. We did not consider it ethical to offer stab incision and tonsillectomy *á froid* to our patients in order to perform a prospective study and therefore used elective tonsillectomy as a control.

In several studies (13) relationships have been shown between the risk of a postoperative haemorrhage after tonsillectomy and both male gender and adulthood. The commonest indication for performing a tonsillectomy in young children is tonsillar hyperplasia, although laser tonsillotomy is becoming an increasingly accepted therapeutic alternative. In teenagers and adults, tonsillectomy is more often undertaken for recurrent or chronic tonsillitis. A history of chronic tonsillitis represents a risk factor for postoperative haemorrhage, as a result of fibrosis, scarring and neovascularization of chronically infected tonsils(14). Additionally, there may also be a relation with dietary trauma. Adults have more autonomy with regard to dietary intake, which may also explain the frequent occurrence of bleeding directly after discharge. Smoking, alcohol intake and sexual behaviour may also play a role. These epidemiological factors were ignored in previous studies in which quinsy tonsillectomy was compared with unselected elective tonsillectomy.

Elective tonsillectomy is more often practised in children, whereas PTA rarely occurs in children and hence abscess

tonsillectomy is rarely performed. This may explain the age distribution in other studies, such as that of Windfuhr and Chen(15), in which the average age of the abscess group was 33.4 years (median 29 years) and that of the tonsillectomy group was 24.6 years (median 21 years).

In our unselected group of 350 abscess tonsillectomies, 55% of the patients were smokers, a rate far higher than that expected from the frequency of smoking in the general population. This supports the suggestion of Dilkes et al. (16) that there may be a link between smoking and quinsy. To avoid these confounding variables we matched our comparison group with our study group with regard to age, gender and smoking habits. In our control group of elective tonsillectomies, the mean age of the patients was 30 years, 61% were males and 50% smokers. Our results showed a strong statistical tendency for young adults to be the predominant postoperative bleeders; children aged <16 years rarely bled.

The difference between male (4.2%) and female (3.5%) bleeders in our study group was not significant, and nor was smoking statistically correlated with postoperative haemorrhage. Other variables, e.g. arterial hypertension, also did not influence the haemorrhage rates of the two groups.

Haemorrhage after tonsillectomy predominantly occurs within the first 24 h after surgery (primary) or else is delayed (secondary), with a peak occurrence after 5-10 days or even later. Primary haemorrhage is more brisk and profuse than secondary; moreover, it occurs when the patient's protective airway reflexes are blunted by post-anaesthetic or narcotic effects. Therefore, most authors consider it to be more serious than late (secondary) bleeding.

In contrast to those studies in which it was concluded that the majority of secondary bleedings happened during the first postoperative days, our data, like those of other studies, show that the majority of secondary bleedings occur at the end of the first week or even later. This is the period after which the patient has usually been discharged and bleeding occurs during the healing phase, in which there is shedding of superficial eschar. The method of haemostasis used during tonsillectomy is supposed to have an influence on the timing of postoperative haemorrhage. Some authors reported ligation to be more associated with primary bleeding and cauterization to be more associated with secondary bleeding. This may explain the rather late haemorrhages observed in our study. However, there is no need for longer postoperative surveillance after an abscess tonsillectomy than after an elective tonsillectomy with regard to bleeding risks. The length of postoperative hospitalization is more likely to be dictated by the general state of the patient, who often feels very ill after abscess formation, which is characterized by odyno-/dysphagia and the need for complicated tonsillectomy.

Some authors have described a relationship between postoperative haemorrhage after tonsillectomy and surgical experience. Other authors did not find a statistically significant relationship. Most of those authors did not explain the method of comparison or just compared trainees with consultants (without subdividing the trainees according to the year of their training) All operations performed by trainees in our institution are

supervised by one of our ENT specialists. Even so, our results show a learning curve for surgeons doing tonsillectomies. Surgeons in their first and second years of training did not have a higher rate of haemorrhage for abscess tonsillectomies (4.8%) than for elective tonsillectomies (5.1%), but they did have more haemorrhages than more experienced surgeons (1.1%). There are two possible explanations for this. Firstly, the inexperienced surgeon may have difficulty dissecting the tonsil out of the right layer and bleeding of the remaining tonsillar tissue may prompt him/her to perform excessive cauterization. Secondly, the surgeon may aim to reduce the operation time by performing exaggerated field cauterization. The result will be the same: excessive cauterization will increase the risk of secondary bleeding by leaving large fields of bacteria-digested necrosis. Although the majority of haemorrhages in our patients were secondary (occurring after electrocauterization), none of our patients had a severe haemorrhage that needed ligation of the external carotid artery. A special technique, such as suturing together the tonsillar pillars, seems to be indicated for high-risk elective tonsillectomy patients. Our results show that, with this method, the rate of a postoperative haemorrhage for these high-risk patients was not higher than that for all other patients.

Our postoperative haemorrhage rate of 2.6% after abscess tonsillectomy is comparable with those reported after ordinary tonsillectomy and abscess tonsillectomy and supports the claim that there is no elevated risk of postoperative haemorrhage after tonsillectomy á chaud for PTA. Furthermore, our results suggest that, if a comparison group is age- and sex-matched with a typical abscess tonsillectomy group, the rate of postoperative haemorrhage after elective tonsillectomy will be even higher (5.5%) than that in other studies. This should be taken into consideration when appraising previous studies.

Abscess tonsillectomy has advantages over the alternative of stab incision and elective tonsillectomy. An abscess tonsillectomy relieves the symptoms directly, additionally detects malignancies presenting as tonsillar abscess and prevents complications due to incomplete drainage as a result of incision, obscure abscesses of the contralateral tonsil (3.4% of our patients), multiple abscesses in the ipsilateral tonsil or even parapharyngeal abscess which may not be detected by needle aspiration or incision under local anaesthesia.

Without tonsillectomy, abscess recurrence after incision was reported in up to 22% of cases; in particular, younger patients will have continuous symptoms such as abscess, recurrent tonsillitis or episodic pharyngitis in 50-63% of cases.

Neither the duration of the operation nor the duration of hospitalization is prolonged with an abscess tonsillectomy. Tonsillectomy á chaud is an economical therapy for quinsy; at the very least it is cheaper than stab incision and a second hospitalization for tonsillectomy á froid.

Only in a few types of patient, such as those using anticoagulants, those with bleeding tendencies, those with severe comorbidity limiting the use of GA and those who are pregnant, do we favour abscess incision and intravenously applied antibiotics only. However, many patients may refuse to have a tonsillectomy performed subsequently.

CONCLUSION

Abscess tonsillectomies are not associated with an increased rate of postoperative haemorrhage in comparison to elective tonsillectomies and therefore represent the medically and economically indicated primary treatment for PTA, especially in younger patients in whom recurrence of quinsy is common.

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