# Tonsillectomy *à chaud*

By Per Bonding (Copenhagen)

Peritonsillar abscess develops as a complication of tonsillitis, when infection spreads to the loose peritonsillar tissues. Insufficiently treated the abscess may perforate into the parapharyngeal space and spread along the vessels of the neck to the mediastinum or upwards under the base of the skull. Thrombophlebitis in the jugular vein, oedema of the larynx, sepsis and metastatic abscesses may be seen.

Adequate drainage in an early stage is essential in order to avoid these serious complications. By tonsillectomy in the acute phase (tonsillectomy *à chaud*) complete drainage is obtained. However, this operation has been regarded as dangerous, thus Zøllner (1934) stated that the operation of tonsillectomy *à chaud* was not free from risk of spreading the infection and that it ought to be reserved for selected cases.

Today there exist other conditions for performing tonsillectomy *à chaud* with regard to the method of operation, anaesthesia and treatment of infections. Bateman and Kodicek (1954), Grahne (1958) and Beeden and Evans (1970) have published optimistic results, of the use of tonsillectomy *à chaud*.

In Scandinavia a conservative attitude (stab-incision and/or antibiotics) is still dominant and the purpose of this work is to investigate the advantages and disadvantages of the routine use of tonsillectomy *à chaud* for peritonsillar abscess.

## Material

During a seven-year-period, 1965 to 1971 inclusive, 317 patients were treated in this department for peritonsillar abscess. Figure 1 shows the age- and sex-distribution. Fifty-six per cent of the patients were males and the age-group from 15 to 19 years represented 28 per cent of all cases. Seventy per cent were younger than 40 years, the youngest patient being 4 years old, the oldest 84 years old.

A rather regular incidence is noticed throughout the year with a maximum in April (Fig. 2).

Of the 317 cases, 155 were right-sided, 152 left-sided, and ten patients (3 per cent) had bilateral abscesses.

The typical story of the period before admission to hospital was as follows : tonsillitis one to three weeks before admission, treated by penicillin, often administrated by the patients for a shorter time than



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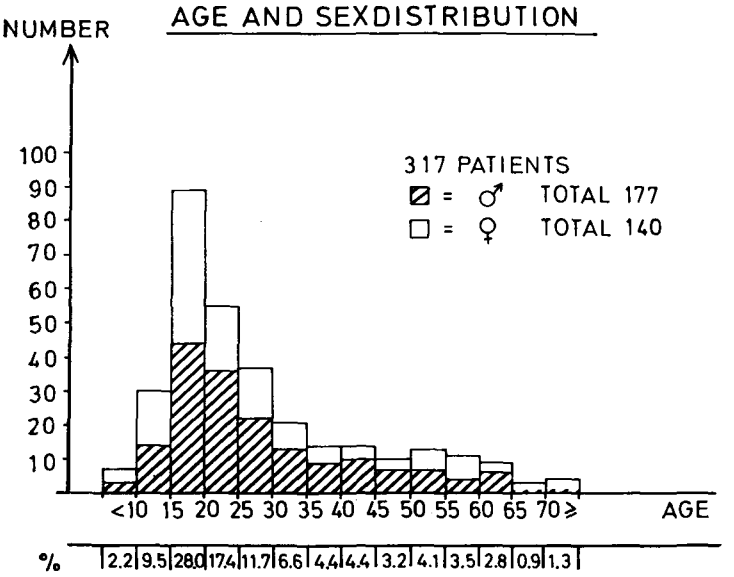



FIG. 1.

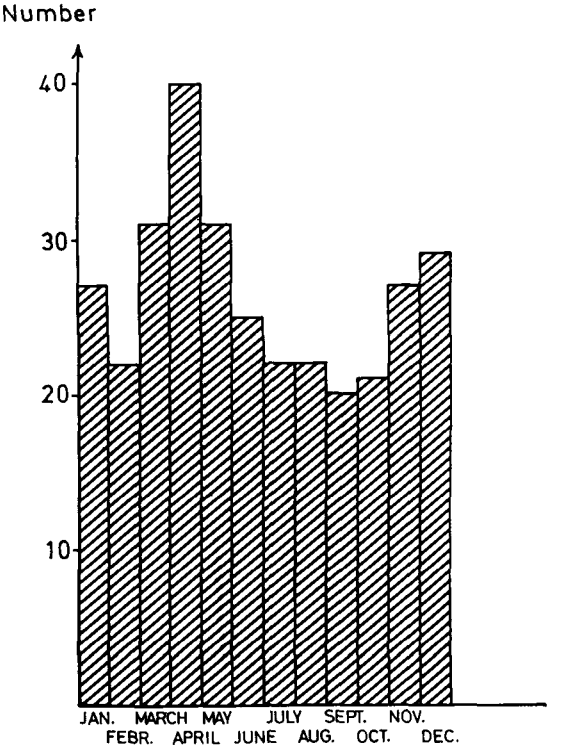



FIG. 2.
Monthly incidence of peritonsillar abscess.



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prescribed and with doses omitted. After a free interval increasingly sore throat, fever and increasing trismus.

The main diagnostic sign was an oedematous and protruding anterior palatine arch, and (in unilateral cases) asymmetry in the throat with displacement of the often swollen uvula to the healthy side. Trismus is a very convincing sign of peritonsillar abscess, but it is lacking in abscesses located deeply behind the tonsil. In the ten patients with bilateral abscess, trismus was the sign which ultimately gave the indication for operation. These cases are often difficult to diagnose, as there is no asymmetry in the throat, and they may be mistaken for cases of severe tonsillitis.

A total of 156 patients (49 per cent) gave a previous history which provided indications for tonsillectomy, either absolutely or relatively. Thirty-five patients (11 per cent) gave a history of peritonsillar abscess in the past and eighty-three patients (26 per cent) had previously had repeated tonsillitis with fever three or more times a year (an absolute indication for tonsillectomy in Denmark); thirty-eight patients (12 per cent) had symptoms of chronic tonsil-affection or had had one to two episodes of acute tonsillitis per year (a relative indication for tonsillectomy).

In sixteen patients (5 per cent) previous tonsillectomy or tonsillotomy had been performed.

Regarding treatment the material is divided into the following four groups:

I. Primary tonsillectomy *à chaud* (288 patients).

II. Tonsillectomy *à chaud* after stab incision (sixteen patients).

III. Stab incision as the only operative treatment (six patients).

IV. No operative treatment (seven patients).

A total of thirteen patients in group III and group IV were not operated upon for the following reasons:

In *group III* two patients rejected tonsillectomy; two patients were in poor general condition; one patient had latent hemophilia; and one patient had a peritonsillar abscess the origin of which was not tonsillitis, but an infected hematoma following the injection of local anaesthesia by a dentist.

*Group IV:* In six patients, all with typical symptoms and signs of peritonsillar abscess on admission, antibiotic therapy cured the throat and made the patients symptom-free within twenty-four to forty-eight hours.

The seventh patient had hemophilia, and for that reason was treated only with antibiotics (a cold tonsillectomy was performed later after repeated abscesses).



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### Pre-operative treatment

Treatment with antibiotics, usually in the form of penicillin by injection, was started soon after admission to the hospital. Most of the patients had received insufficient or no antibiotic treatment at all at home. Only patients with threatening perforation or severe oedema in the throat were operated upon immediately after admission. The time-interval from admission to operation will be seen in Table I. Seven per cent of the patients were operated on within eight hours, 78 per cent within twenty-four hours of admission. The causes of especially long time-intervals between admission and operation are illustrated in Table II.

TABLE I.
TIME FROM ADMISSION TO THE HOSPITAL TO OPERATION

| Hours | <8 | 8–16 | 17–24 | 25–36 | 37–72 | >72 | Total |
|---|---|---|---|---|---|---|---|
| Number | 20 | 89 | 128 | 19 | 33 | 15 | 304 |
| % | 7 | 29 | 42 | 6 | 11 | 5 | 100 |

TABLE II.
CAUSES FOR TIME INTERVAL OVER 36 HOURS FROM ADMISSION TO THE HOSPITAL TO OPERATION

| | Number |
|---|---|
| Uncertain diagnosis | 21 |
| Complicating diseases | 2 |
| Primary treated by incision | 2 |
| Spontaneous perforation at admission | 3 |
| Severe oedema in pharynx | 1 |
| No information in the journal | 19 |
| Total | 48 |

Pain was relieved by salicylic acid dissolved in water, in doses of 1 gram./4–6 hours. At follow-up examination, 97 per cent of the patients remembered the waiting time without any hard feelings—most of them had slept.

### Operation

Bilateral dissection-tonsillectomy was carried out by the method of Boyle Davis (Proctor, 1960), i.e. with the patients in the supine position under general anaesthesia.

General anaesthesia by Halothane-$N_2O$ after premedication with Pentobarbital.

Technically the operation is not notably more difficult than cold



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tonsillectomy. Trismus may be troublesome, offering little space for the instruments, but usually diminishes under a well-directed anaesthesia. The abscess-tonsil is enucleated first—in most cases very easily, as the abscess in itself has dissected the plane of cleavage.

Bleeding is slightly more pronounced than at cold tonsillectomy, especially from the opposite tonsil, but is nearly always quickly controlled by compression alone. A relative measure of the blood loss is given in Table VII.

*Oedema* in the pharynx was pronounced in five cases, and in two of these cases the patient was kept intubated naso-tracheally for 24 hours post-operatively. The tube was removed without further problems. Both patients had a severe oedema before the operation; one had an enormous one-sided abscess, the other large bilateral abscesses. The remaining three patients were intensively observed post-operatively, the course uncomplicated. Two of these patients had only the abscess-tonsil removed, as the operator was afraid of increasing the oedema.

## Operative findings

(*A*) *Contents of the abscess*

Pus was found in 78 per cent of the cases (Table III). In 18 per cent either necrotic peritonsillar tissue, probably representing suppurative inflammation in an early phase, or an empty abscess cavity, was found. In this group spontaneous perforation was noted at admission or preoperatively in seven cases, and in six cases stab incision had been performed before operation. In only 1 per cent of the cases was no sign of suppurative inflammation found. In 3 per cent of the cases no information was given in the records.

TABLE III.

OPERATIVE FINDING (WITH RESPECT TO STAGE OF THE INFECTION)

| | Number | % |
|---|---|---|
| Abundant pus | 173 | 55 |
| Sparse pus | 73 | 23 |
| Empty cavity or necrotic peritonsillar tissue | 57 | 18 |
| Only slight peritonsillitis | 3 | 1 |
| No information | 8 | 3 |
| Total | 314* | 100 |

* Ten patients had bilateral abscess.

The findings at operation in the sixteen patients in whom incision had been performed before operation (the earlier-mentioned group II) are



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illustrated in Table IV. The incision was performed from twelve to forty-eight hours before the operation. Table IV illustrates that in two-thirds of the cases the drainage at stab incision was insufficient. However, this group is partly selected, five of the patients having been admitted to the hospital by otolaryngologists because of failure to find pus at the initial incision. In the group in which pus was found by incision (not selected), one-third of the patients had their abscess insufficiently drainaged.

TABLE IV.
OPERATIVE FINDING IN 16 PATIENTS WHO HAD STAB INCISION PERFORMED BEFORE OPERATION

| At incision | | At operation | |
|---|---|---|---|
| | | + Pus | − Pus |
| + Pus | 9 | 3 | 6 |
| − Pus | 7 | 7 | 0 |
| Total | 16 | 10 | 6 |

(*B*) *The site of the abscess* is poorly elucidated in this material, as it is only described in eighty-five cases. Figure III shows a schematic representation of the abscess sites in these cases. One of the posterior abscesses had perforated the pharyngeal constrictor muscle, and a minor parapharyngeal abscess developed (well-drained at tonsillectomy alone).

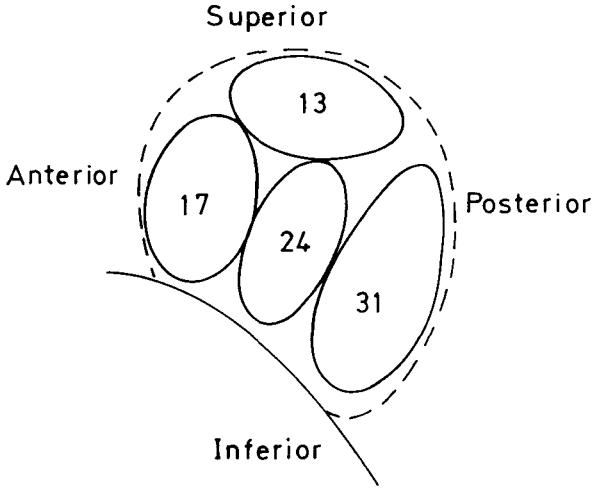



FIG. 3.
Schematic representation of the abscess site in 85 cases.

## Bacteriology

Per-operative specimens from the abscess were cultured in 269 cases. The results are recorded in Table V.



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TABLE V.

BACTERIOLOGY OF PUS, CULTURED FROM THE ABSCESS.
269 CASES (PER-OPERATIVE SPECIMENS)

| | No. | % |
|---|---|---|
| Sterile | 74 | 27 |
| Staph. albus only | 30 | 11 |
| Streptococci: | | |
| Non-hemolytic | 18 | 7 |
| α-hemolytic | 4 | 1 |
| β-hemolytic, gr. A | 34 | 13 |
| β-hemolytic, other gr. | 8 | 3 |
| Pneumococci | 4 | 1 |
| Hemophilus influenzae | 54 | 20 |
| Staph. aureus | 26 | 10 |
| Gram-negative rods | 33 | 13 |
| Miscellaneous | 9 | 3 |

## Post-operative course

The post-operative course did not differ from the course of cold tonsillectomy, except in one way: the patients were relieved instead of complaining of pain. Trismus, dysphagia and pain were replaced by a mild discomfort the day after the operation. Tissue-reaction in the throat normally did not differ from the reaction at cold tonsillectomy, and oedema had disappeared.

Pre-operatively 75 per cent of the patients had raised temperature. Eighty-two per cent of the patients had normal temperature within 24 hours after operation, 96 per cent within 72 hours.

Table VI shows the duration of stay in the hospital. Seventy-seven per cent of the patients were discharged within seven days (day of admission and discharge included). Probably the stay in hospital could have been shortened in most cases, but we wanted to assure proper accomplishment of the antibiotic treatment. In the last year of the 7-year period 60 per cent of the patients were discharged within six days, compared with 35 per cent in the first year.

TABLE VI.

DURATION OF STAY IN HOSPITAL
(Day of admission and discharge included)

| Days in hospital | 3 | 4 | 5 | 6 | 7 | 8 | 9 | more | total |
|---|---|---|---|---|---|---|---|---|---|
| Number of patients | 1 | 2 | 36 | 96 | 97 | 38 | 15 | 19 | 304 |
| % | 0·3 | 0·7 | 12 | 31 | 32 | 13 | 5 | 6 | 100 |



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## Complications

It is a characteristic feature of this material that pre-operative difficulties (including incomplete removal of the tonsils) are correlated to the surgeon's experience, while post-operative complications are widely distributed between operators at all degrees of operative experience.

(*A*) *Per-operative complications*

Pronounced *bleeding* at the operation was recorded in eleven patients (3·6%). In seven of these cases the blood loss was estimated between 400 and 1000 ml.

One patient (blood loss unestimated) was admitted to the hospital as an emergency case, because of severe bleeding after stab incision and operated on at once.

In seven cases a pack was sewn into the tonsillar fossa (all except one in 1965 and 1966). Transfusion was given to two patients (blood loss 1000 and 850 ml.). No cases of shock or severe anaemia were seen.

The average fall in hemoglobin concentration indicates a measure of the average blood loss at the operation.

In seventy patients selected at random (ten from every year), the difference between pre-operative and post-operative hemoglobin-concentration was on average 1·0 g./100 ml. In a material of patients from the same department, in which adeno-tonsillectomy or cold tonsillectomy was performed, the same value was 0·8 g./100 ml. (100 patients selected at random (Table VII).

TABLE VII.
CHANGE IN HEMOGLOBIN CONCENTRATION
2. – 4. POST-OPERATIVE DAY

| Operation | Material | Post-operative hemorrhage | Average change in hemoglobin-concentration |
|---|---|---|---|
| Tonsillectomy *à chaud* | 15 patients | + | −1·7 g/100 ml. |
| | 70 patients* | − | −1·0 g/100 ml. |
| Ordinary tonsillectomy | 100 patients† | − | −0·8 g/100 ml. |

* Random selection, 10 patients from each year.
† A material from the same department.
(Falbe-Hansen *et al.*, 1972.)

*A lesion of the palatine arches* was recorded in two cases (one of these also recorded as pronounced per-operative bleeding).

*Miscellaneous.* One patient had so severe a trismus that the operator was content with removal of the abscess tonsil alone.

(*B*) *Post-operative complications*

*Post-operative hemorrhages* were seen in fifteen patients (=4·9 per cent) divided into nine primary (within twenty-four hours from operation)



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and six secondary hemorrhages. Hemostasis under general anaesthesia was found necessary in eight cases (Table VIII). Thirteen of the fifteen patients were males.

The decrease in hemoglobin concentration (Table VII) from the pre-operative value in these patients averaged 1·7 g./100 ml. (borders 0·7–4·0 g./100 ml.).

In no case was shock or severe anaemia recorded. Transfusion was given to one patient. Hemostasis under general anaesthesia was in all cases uneventful, performed by ligation and in one case sewing in of a pack.

*Other post-operative complications*

No manifestations of embolic abscesses or septic spread of the infection were seen. Thirteen patients (4 per cent) had raised temperature (of low grade) over seventy-two hours post-operatively. In these cases local reaction in the tonsillar fossa, slightly over average, was found as the only cause.

At discharge tonsil-remnants were noticed in eleven patients (2·6 per cent). Two of these were later re-operated and in one case bilateral chronic abscesses were found in the tonsil-remnants.

TABLE VIII.

POST-OPERATIVE HEMORRHAGES. TREATMENT IN RELATION TO TIME OF BLEEDING

| | | Primary | Secondary | Total | |
|---|---|---|---|---|---|
| | | | | Number | % |
| Hemostasis in under general anaesthesia | | 7 | 1 | 8 | 2·6 |
| Hemostasis under local anaesthesia | | 2 | 1 | 3 | 1·0 |
| No treatment | | 0 | 4 | 4 | 1·3 |
| Total | Number | 9 | 6 | 15 | 4·9 |
| | % | 2·9 | 2·0 | 4·9 | |

## Discussion and conclusion

Beeden and Evans (1970) have pointed out that the site of a peritonsillar abscess often makes it difficult to obtain sufficient drainage by stab-incision only. In Beeden and Evans material only twenty-eight of sixty-three patients had their abscess located at the upper pole of the tonsil. According to these authors only these twenty-eight abscesses would have been sufficiently drained by the typical stab-incision. In the present investigation at least fifty-five of the abscesses were located laterally or in the posterior part of the tonsillar fossa, and in these cases it would probably have been hard to obtain sufficient drainage by stab-incision. The findings in sixteen patients who were treated by tonsillectomy



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*à chaud* after a stab-incision support this belief. Even in those cases where pus was found at the incision one-third of the patients still had pus in the abscess cavity at operation. The clinical manifestations of residual pus are the slow disappearance of trismus and the persistence of pain in patients who have been treated by incision.

Tonsillectomy *à chaud* assures total evacuation of pus, reflected in a complete recovery from both trismus and pain the day after the operation. This is the main advantage of the method. Further, the patient is spared a further admission to the hospital for interval tonsillectomy, which is the normal procedure in Scandinavia in patients with recurrent peritonsillar abscess or tonsillitis (49 per cent of the patients in this material).

No fatalities were seen in this material, nor in the material of Grahne (725 cases) or Beeden and Evans's material (100 cases). In Bateman and Kodicek's material (40 cases) one patient died—but was at admission in extremely bad condition with a large parapharyngeal abscess extending from the skull base to the mediastinum.

Per-operative bleeding was in the average case only slightly more pronounced than at cold tonsillectomy. Only two patients had a blood loss as high as 800–1000 ml., none of them with signs of shock or grave anaemia. The patient admitted because of severe bleeding after stab-incision, placed too far laterally, was the only case in which hemostasis was a major problem.

As it will be seen from Table IX the incidence of post-operative bleeding (4·9 per cent) at tonsillectomy *à chaud* was only 0·3 per cent higher than at cold tonsillectomy. Nearly the same is true regarding bleeding demanding hemostasis under general anaesthesia. Williams (1967) found an incidence of 0·36 per cent post-operative hemorrhages in 18,000 tonsillectomies, a striking difference from the material of Breson and Diepeveen (1969) and the present material. However they are not comparable.

TABLE IX.

POST-OPERATIVE HEMORRHAGES. COMPARISON BETWEEN TONSILLECTOMY À CHAUD AND À FROID (2 MATERIALS FROM THE SAME DEPARTMENT)

| | Authors | Number of patients | Total % post-operative hemorr-hages | % primary | % secondary | % demand-treatment | % treated under general anaesthesia |
|---|---|---|---|---|---|---|---|
| À Froid | Breson and Diepeveen | 10·000 | 4·6 | 1·4 | 3·2 | 2·4 | 2·1 |
| À Chaud | Bonding | 304 | 4·9 | 2·9 | 2·0 | 3·6 | 2·6 |



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No clinical manifestations of bacteriaemia, nor of metastatic abscesses, were seen in this material. Theoretical risk of septic spread of the infection might exist, as one is operating in an infected field; but this risk seems to be more theoretical than practical. The creation of sufficient drainage seems to be more important, and it fully compensates for the effect of manipulation in an infected area.

In conclusion: no evidence is found in this investigation, which indicates that tonsillectomy *à chaud* is a hazardous operation. It seems to be the method of choice in the treatment of peritonsillar abscess both from a theoretical and from a practical point of view. One reservation only must be made: in a group of patients one will remove tonsils, which (according to the Scandinavian indications for interval-tonsillectomy) would not otherwise have been removed. A follow-up investigation is being conducted in order to evaluate the significance of this matter.

**Summary**

A retrospective investigation is presented of a seven-year experience of patients with peritonsillar abscess, treated by tonsillectomy *à chaud* under antibiotic cover. A total of 304 patients were operated on. The abscess was bilateral in 3 per cent. No fatalities and no manifestations of septic or metastatic spread of the infection were seen. Per-operative-bleeding was only slightly more pronounced in the average case than at cold tonsillectomy. Only two patients had a blood loss as high as 800–1000 ml. Post-operative hemorrhages were seen in 4·9 per cent compared with 4·6 per cent of cases of cold tonsillectomy from the same department. In no case was shock or severe anaemia seen.

Complete drainage of the pus, reflected in the disappearance of trismus and pain within 24 hours after operation, is the main advantage of the method. Stab-incision, in a high proportion of patients, fails to create sufficient drainage. Even in cases where pus is found at incision, there may still be pus in the abscess cavity (in this material in three of nine patients).

In conclusion: tonsillectomy *à chaud* seems to be the method of choice in the treatment of peritonsillar abscess. A follow-up investigation is being conducted to evaluate the long-term results.

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