Study of the Effects of 736 Tonsillectomies and of 741 Controls

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It is impossible to think of any operation or procedure which is as commonly resorted to for the correction of any and all defects or complaints as is a tonsillectomy. Our search through available literature on the subject reveals an abundance of material and an almost universal opinion that good results, both curative and preventive, are to be expected.

Kaiser, of Rochester, N. Y., has done a very thorough and gratifying piece of work with convincing conclusions.

Besides verifying the figures and results obtained by Kaiser, Barrett, Robey, Mann and others, we have drawn some conclusions as to:

1. The age group which shows the greatest improvements and the complaints, if any, which can be relieved to the greatest degree in the respective age groups.
2. The length of time after operation before improvement is evidenced and the symptoms showing the earliest tendency toward improvement.
3. The effect on the school progress of those being physically handicapped.
4. The effect on children with subnormal mentality or those who are mentally retarded and lack application and alertness.
5. The effect of tonsillectomies on the progress of children having coexisting conditions related and not related to diseased tonsils.

It has been suggested by Brokay and others that the parents should be consulted as to the child's condition following the operation. In our study the parents' opinions were obtained in each case. We believe that information secured through the parents' daily observation is likely to be more dependable than that which might be secured from any other single source; however, the teachers' observations were not overlooked. We were also mindful of the fact that this information should be supplemented by physical examinations before and after operation.

This study was based on cases operated on by private physicians.

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in the Oakland County Tonsil and Adenoid Clinics together with a small number of cases operated on in other clinics.

Oakland County's tonsil and adenoid clinic was organized because of the difficulty and expense of caring for indigent children in state institutions, and because of the lack of outpatient departments in our city and county hospitals. Each case, before admission to the clinic, was first recommended by the family physician both from the medical and financial standpoint, then carefully investigated by our field workers and by the Township Supervisor. Indigent patients and those who were able to pay up to $10.00 were admitted. The tonsillectomies were performed by local surgeons at greatly reduced fees, and we gratefully acknowledge the support given the clinic by the Oakland County Medical Society.

A careful history was taken and a physical examination made on each child upon admittance, and through this arrangement 736 cases were operated on and studied.

In determining the candidates for the clinic and for follow-up work, uniform blanks were used.

It was determined early in the study to check carefully the improvement rather than the complete cessation of complaints or symptoms. Although in many cases the symptoms or complaints were entirely absent after the operation, it seemed reasonable that our study be confined solely to improvements.

A study was made of the effects of tonsillectomies upon children who were not gaining weight and not developing normally, those with evidence of malnutrition, those with marked enlargement of cervical glands, those with rheumatic manifestations, those who complained of colds and sore throats, and those with retarded school progress and subnormal mentality.

In Figure I, we have a general summary of cases studied before and after operation. There was apparently no complaint or symptom which failed to improve. In our study of cervical glands, only cases which showed marked enlargement were considered, and out of 191 cases studied, 48 children failed to show improvement. The most striking improvement occurred in the group having frequent colds and sore throats. Of the total number studied, 530 cases, or 72 per cent, had this complaint before the operation, with 102 failing to show any improvement.

The enthusiasm of the mothers in regard to the children's progress in school following the operation was very marked. Of the 222 children having this complaint only 88 failed to show improvement.

We were somewhat surprised to note the effect of this operation on the group of subnormal mentality. Out of 148 cases in this group 57
failed to show improvement. There was a marked improvement in cases with evidence of malnutrition. One hundred eighty-eight, or 25.5 per cent of all cases studied, showed this complaint, and there was a failure of improvement in only 73 of this group. The same beneficial results were noted in children not gaining weight or not developing normally, and in those having rheumatic manifestations.

STUDY BY AGE GROUPS

In studying the beneficial effects on children grouped according to age (see Figure II), no striking results were obtained. The most marked improvement of all complaints was observed in the younger age groups.

Failure in older age groups (13 and over) can be accounted for in many ways. The longer any ailment persisted the less marked the improvement; it was only natural for the older age group to be less responsive to improvement in school progress and mental efficiency than children in the younger age groups.

STUDY OF RESULTS BY TIME LAPSE SINCE OPERATION

In this study we have drawn some conclusions as to how soon after operation improvement may be expected. From the figures
shown in Figure III, children who were not gaining weight and were not developing normally before the operation showed a little improvement during the earlier months, reaching the peak of improvement about 16 to 18 months after operation. There were no marked beneficial results in children showing signs of malnutrition, although a failure of only 36.5 per cent during the first 6 months was gratifying.

As was expected, improvement in the marked enlargement of cervical glands was not characteristic to any period. Rheumatic manifestations showed remarkable improvement during the first 6 months. Frequent colds and sore throats were decidedly improved during the first 6 months following operation. Advancement in school progress and mental development was not marked during the first 6 months after operation but there seemed to be consistent progress in the periods which followed.
We have not tabulated the relief from mouth breathing as the study has been done many times by others with most convincing results.

General progress of those cases showing improvement in one or more complaints was very noticeable, the most outstanding results being obtained during the first 6 months. Out of 192 cases in this age group, there were 12 failures (6.3% per cent), or 93.7 per cent of the cases showed complete or partial improvement.

**STUDY OF RESULTS IN PRESENCE OF COEXISTING CONDITIONS**

We have analyzed the results of tonsillectomies on children who at the time of operation had some coexisting ailment.

From the group of 736 children who were operated on, 120 had coexisting conditions. In the analysis of the results of operation on this group (see Table I), we found that 43 failed to improve, and 77 showed improvement.

We have failed to find that coexisting ailments had any influence upon the results of the operation with the possible exception of pulmonary tuberculosis.

From the table it will be seen that in this group there were 26
cases of pulmonary tuberculosis, 16 of which failed to improve. Considering that the number of cases failing to show improvement is almost twice as great as the number showing improvement, the ratio of failure to improvement would be 2 to 1. The figures, of course, are too small to do more than bear out the consensus of opinion that great care should be exercised before determining whether or not the child with pulmonary tuberculosis should be operated on.

**TABLE I**

**ANALYSIS OF RESULTS OF OPERATED CASES IN WHICH COEXISTING AILMENTS WERE PRESENT AT TIME OF OPERATION**

<table>
<thead>
<tr>
<th>Conditions Present</th>
<th>Total Number of Children</th>
<th>Number Failed to Improve</th>
<th>Number Showed Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary Tuberculosis</td>
<td>26</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>Heart</td>
<td>7</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Ear</td>
<td>16</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Chorea</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Dental (marked defects)</td>
<td>20</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Infectious Diseases following within 10 days</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Sinus</td>
<td>13</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Hay Fever—Asthma</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kidney</td>
<td>7</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Nervousness</td>
<td>9</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Surgical</td>
<td>8</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Gynecological</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>43</td>
<td>77</td>
</tr>
</tbody>
</table>

This table, with the one exception mentioned, shows us that coexisting conditions are not contraindications for operation. As a matter of fact they might even be additional reasons for operation.

**STUDY OF CONTROL GROUPS**

In our control group (see Figure IV), we have examined 741 children whose state of health was apparently similar to that of those in the group operated on.

The general progress made by the children in the control group was, as would be expected, unsatisfactory. Children with infected tonsils retained the focuses of infection and the symptoms and complaints which were present at the time of the first examination were still apparent at the check-up made a year later.

Careful analysis of Figures V—A, B, C, and D, leads us to assume that the theory of waiting for the child to outgrow its defects is not justifiable.

**SUMMARY AND CONCLUSIONS**

From an analysis of the complaints of 736 children before and after operation, compared with an analysis of the complaints of 741
children in the control group having similar complaints on examination and reexamination one year later, the following conclusions were made:

1. Tonsillectomy offers a child considerable relief from such common complaints as sore throat, head colds and mouth breathing. It reduces malnutrition and promotes disappearance of enlarged cervical glands.

2. Complaints have been relieved in 91 per cent of our group of cases operated on. We should not be unmindful of the fact that tonsillectomy is a surgical procedure and has its possible dangers and complications. However, in the group of cases operated on in our County Tonsil Clinic no fatalities have occurred.

3. Comparison of the results obtained from a study of the different age groups clearly indicates that in order to obtain the maximum benefit the child should be operated on in early childhood.

4. Children with subnormal mentality and retarded school progress due to enlarged tonsils and adenoids showed improvement in 40 per cent of all cases operated on.

5. In our series of 736 cases, coexisting conditions were present in 120 cases. The conditions should not be considered as contraindications for tonsillectomy, with the exception of cases of pulmonary tuberculosis which must be very carefully studied before operation is decided upon.

6. Complaints in the control group of cases do not show any improvement during the period of one year of observation as compared with 91 per cent of improvement shown in the group of cases operated on.

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