

# THE INCIDENCE OF TONSILLAR TUBERCULOSIS

(PRIMARY AND SECONDARY LESION)

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This report will endeavor not to stress too seriously the importance and the incidence of this disease and thereby hope to prevent the wholesale removal of tonsils and adenoids without proper regard for the usual indications for their excision. Our attention, however, is not frequently enough directed to these structures in considering them a portal of entry for the tubercle bacillus or as a focus for a primary lesion of tuberculosis.

Primary tuberculosis of these structures is by no means a very common lesion yet it is certainly not to be considered as a very rare lesion. Secondary tuberculosis in this region is quite common but the character of the lesion usually allows it to escape detection. It has been the custom for the clinician and the pathologist to arrive at an opinion regarding disease in these organs by the history of the case and by inspection of the organs and only those organs have been subjected to a microscopic examination which have shown a gross lesion that was suspicious. Since the majority of the cases can only be diagnosed by microscopic examination, the true incidence of the disease has long escaped attention. Most of our standard text-books fail to properly present the subject or to furnish the reader a bibliography. Virchow (1) made the statement in 1864 that tuberculosis of the tonsils had not yet been observed and this idea has been passed down to us by text-books almost up to the present editions. Many of the crypts in the tonsil have imperfect or contracted openings on the oral surface and this allows these deep, hidden recesses to fill up with secretion, desquamated cells, debris and bacteria and such a condition associated with body temperature make splendid places for the development of inspired or ingested tubercle bacilli. So long as the epithelial barrier remains intact there is little opportunity for the organisms lodged in the crypts to gain an entrance to the lymphoid tissue. Routine microscopic study of tonsils will show that nearly all of them have at some point in one or

more crypts a defect or two in this barrier that have been caused by pyogenic organisms. Furthermore, a crypt full of concretions aided by the frequent act of swallowing, sneezing, vomiting, etc; may offer a mechanical means for the production of slight abrasions and lacerations of the crypt walls and thus offer a portal of entrance.

It seems to me reasonable to believe that at some time during life most of us have had a solitary tubercle or so of this disease in our tonsils and that in many instances they can become arrested in development and even heal just as do so many of the invaded lymph nodes found at the bifurcation of the trachea. Nevertheless, it must be expected that extensions of the disease do occur and I think the survey of these cases will indicate some features to be watched for that are not commonly enough emphasized. A routine microscopic examination of the tonsils and adenoid vegetations removed at Ancon Hospital was not practiced until near the close of the year 1919. It was not long after this method was instituted that a specimen showing miliary tuberculosis was encountered. Steps were then taken to establish a uniform method for the examination of all tonsils and adenoids received from the clinic as well as from all cases subjected to autopsy in our laboratory.

## METHOD

All specimens were given a careful gross inspection in the fresh state and then placed in formaldehyde (10%) for 24 hours. A second gross inspection was made after fixation of all cut surfaces. It was the rule to cut the organs through their vertical axis and make one central or as many other parallel blocks of the tissue as the size of the organ would permit. Usually from one to three blocks from each tonsil, or in the case of the adenoid vegetation all the tissue was collected into one or two blocks. These blocks were then run through the usual paraffine method of preparation and stained with hematoxylin and eosin. An average of two slides were prepared from each block of tissue but in case a suspicious lesion was encountered further sections were cut to complete the study. It has been purely a histological survey since there were certain difficulties in carrying out attempts to cultivate the organism or recover it from inoculated animals that our routine laboratory service would not permit to be undertaken.

## THE CHARACTER OF THE CASES STUDIED.

I have not been able to find anywhere in the literature at our command a report of the incidence of tuberculosis in tonsils removed at autopsy. It

seemed quite worthwhile to parallel a study of the clinical material with similar material covering the same period of time taken from the cases coming to autopsy. The survey will, therefore, cover two classes of material, that is, the clinical material which should chiefly include the cases with a primary focus of the disease; and the autopsy material which it is reasonable to suppose would represent, in the majority of the cases, secondary lesions of the disease. They will be considered under Groups A and B respectively.

**Group A:** This comprises 1311 consecutive cases from which the tonsils and adenoids were removed at Ancon Hospital. In almost every case both tonsils were removed and studied under one specimen number. In approximately half the cases the adenoid vegetations were also received and entered under same specimen number.

These cases came from all parts of the Canal Zone and a few of them from various sources outside the Zone.

The great majority of them came from school

children or from sailors and soldiers stationed in the Canal Zone.

The negro race (West Indies) is well represented in the series but the native Spanish-Indian and Spanish-Negro mixture has too small a group to offer representative results.

**Group B:** This group consists of 657 consecutive autopsies performed during the same period of time at our laboratory. The group, however, excludes all autopsies performed on still births, premature births, and children dying soon after birth as a consequence of some labor accident and all other children under one month of age. One or two incomplete regional autopsies were also excluded.

It is the intention to study only those cases subjected to complete regional autopsy so that the general distribution of any tuberculosis encountered might be noted in relation to tonsillar lesions of the disease. The race, age and sex features are relatively the same as in Group A.

**GROUP A**  
(1311 CONSECUTIVE CLINICAL CASES)

TABLE I.  
(AGE AND RACE)

Ages	White Cases Examined	White Cases Positive	Black Cases Examined	Black Cases Positive	Mestizo Cases Examined	Mestizo Cases Positive
Under 3 yrs & over 1 month	23	0	11	2	0	0
3 to 6 years	194	5	115	10	2	0
7 to 10 years	130	3	114	1	6	0
11 to 14 years	60	0	47	0	4	0
15 to 24 years	267	4	54	0	8	1
25 to 34 years	168	0	39	1	3	0
35 to 44 years	43	1	9	1	0	0
45 to 54 years	9	0	1	0	1	0
55 to 64 years	3	0	0	0	0	0
65 years & over	0	0	0	0	0	0
Totals	897	13	390	15	24	1

There were 1311 individuals examined and 29 of them revealed apparently a primary tuberculosis of the tonsils and adenoid vegetation or some one or more of these three structures. A per cent of 2.21.

Incidence by race was as follows:

White race	1.45%
Black race	3.84%
Mixed race (Mestizo)	4.17%

TABLE II.

(AGE INCIDENCE COMBINED)

Under 3 years & over 1 month .....	5.88%
3 to 6 years .....	4.82%
7 to 10 years .....	1.60%
11 to 14 years .....	0.00%
15 to 24 years .....	1.51%
25 to 34 years .....	0.04%
35 to 44 years .....	3.84%
45 to 54 years .....	0.00%
55 to 64 years .....	0.00%
65 years and over ..	0.00%

A striking tendency to appear in children under 5 years of age.

## BRIEF ANALYSIS OF THE POSITIVE CASES

**Case 1 :** A mestizo woman of 16 years, married.

Diagnosis: Chronic tonsillitis.

History of sore throat for two months.

No macroscopic indication of tuberculosis in the tonsils or elsewhere.

Stay in hospital of 4 days. Temperature average 99.5 degrees.

**Case 2 :** A White school girl of 9 years:

Diagnosis: Phlyctenular kerato-conjunctivitis.  
Chronic tonsillitis.

Hypertrophy of the tonsils and adenoid vegetation.

The stay in the hospital was 28 days.

Temperature average was 100 degrees.

No macroscopic indication of tuberculosis.

**Case 3 :** A white school-girl of 10 years.

Diagnosis: Adenoid vegetations.

Stay in hospital of 3 days.

Temperature average was 100 degrees.

No macroscopic indication of tuberculosis.

**Case 4 :** A black girl baby of 23 months.

Diagnosis: Adenoid vegetations.

Stay in hospital of 3 days.

Temperature average of 99.5 degrees.

No macroscopic indication of tuberculosis.

**Case 5 :** A black girl baby of 3 years and 7 months.

Diagnosis: Hypertrophy of the tonsils and adenoid.

Stay in hospital of 3 days.

Temperature average of 100 degrees.

No macroscopic indication of tuberculosis.

**Case 6 :** A black school-girl of 6 years.

Diagnosis: Hypertrophy of the tonsils and adenoid.

Stay in hospital of 2 days.

Temperature average was 100 degrees. No knowledge of tuberculosis.

**Case 7 :** A white boy of 4 years.

Diagnosis: Hypertrophy of the tonsils and adenoids.

Stay in hospital of 2 days.

Temperature average of 99 degrees.

No knowledge of a tuberculous lesion in the case.

**Case 8 :** A white boy of 3 years.

Diagnosis: Hypertrophy of the tonsils and adenoid.

Stay in hospital of 2 days.

Temperature average of 98 degrees.

No knowledge of the presence of tuberculosis.

**Case 9 :** A black boy 1 year and 7 months old.

Diagnosis: Pneumonia, Bilateral Otitis Media,  
Phlyctenular Kerato-conjunctivitis bilateral,  
hypertrophy of tonsils and adenoids.

Stay in hospital of 79 days. Temperature ran a septic course with several high elevations. No knowledge of presence of tuberculosis.

Von Pirquet test positive. Wassermann test negative.

**Case 10 :** A white sailor of 21 years. Employed as a waiter.

Diagnosis: Hypertrophy of the tonsils. Frequent attacks of sore throat.

Stay in hospital of 9 days.

Temperature average was 100 degrees.

Wassermann test negative.

No knowledge of the presence of tuberculosis.

**Case 11 :** A black, married woman of 25 years.

Diagnosis: Hypertrophy of the tonsils.

Stay in hospital of 6 days.

Temperature average of 100 degrees.

No gross sign of tuberculosis.

**Case 12 :** A white sailor of 19 years.

Diagnosis: Hypertrophy of the tonsils.

Stay in hospital of 6 days.

Temperature average of 99.5 degrees.

No gross sign of tuberculosis.

**Case 13 :** A white boy of 5 years and 3 months.

Diagnosis: Acute otitis media, right. Hypertrophy of tonsils and adenoid.

Stay in hospital of 13 days.

Temperature average 100 degrees.

No gross idea of the presence of tuberculosis.

**Case 14 :** A black girl of 4 years.

Diagnosis: Phlyctenular kerato-conjunctivitis,  
hypertrophy of the tonsils and adenoid vegetation.

Stay in hospital of 22 days.

Temperature average of 100 degrees

No gross idea of presence of tuberculosis. A later Von Pirquet test was positive. The Wassermann test was negative.

**Case 15 :** A white soldier 20 years of age.

Diagnosis: Chronic tonsillitis.

Stay in hospital of 14 days.

Temperature average of 99 degrees.

No idea of the presence of tuberculosis.

- Case 16:** A black, married woman of 39 years.  
 Diagnosis: Chronic tonsillitis.  
 Stay in hospital of 5 days.  
 Temperature average of 100 degrees.  
 No idea of the presence of tuberculosis.
- Case 17:** A black girl of 3 years.  
 Diagnosis: Phlyctenular kerato-conjunctivitis, hypertrophy of the tonsils and adenoid.  
 Stay in hospital of 19 days.  
 Temperature average of 100 degrees.  
 No idea of presence of tuberculosis. Wassermann test negative.  
 A later Von Pirquet test positive.
- Case 18:** A black girl of 5 years.  
 Diagnosis: Otitis media. Hypertrophy of tonsils and adenoids.  
 Stay in hospital of 20 days.  
 Temperature average of 100.5 degrees.  
 No gross idea of the presence of tuberculosis.
- Case 19:** A black school-girl of 7 years.  
 Diagnosis: Hypertrophy of the tonsils and adenoid.  
 Frequent attacks of sore throat.  
 Stay in hospital of 4 days.  
 Temperature average of 100.5 degrees.  
 No idea of the presence of tuberculosis.
- Case 20:** A white school-girl of 7 years.  
 Diagnosis: Hypertrophy of the tonsils and adenoid.  
 Stay in hospital of 3 days.  
 Temperature average of 100.5 degrees.  
 No idea of presence of tuberculosis.
- Case 21:** A black girl of 3 years.  
 Diagnosis: Phlyctenular kerato-conjunctivitis. Hypertrophy of the tonsils and adenoids.  
 Stay in hospital of 7 days.  
 Temperature average was 100 degrees.  
 No idea of presence of tuberculosis.
- Case 22:** A white boy of 4 years.  
 Diagnosis: Hypertrophy of the tonsils and adenoids.  
 Stay in hospital of 4 days.  
 Temperature average of 100 degrees.  
 No idea of the presence of tuberculosis.
- Case 23:** A white, married woman of 37 years.  
 Diagnosis: Chronic tonsillitis. Frequent attacks.  
 Stay in hospital of 5 days.  
 Temperature, normal.  
 No idea of presence of tuberculosis.
- Case 24:** A black girl of 6 years.  
 Diagnosis: Hypertrophy of the tonsils and adenoid. Hereditary syphilis. Wassermann tests positive.  
 Stay in hospital of 6 days.  
 Temperature average of 99.  
 No idea of presence of tuberculosis.
- Case 25:** A white boy 4 years and 3 months old.  
 Diagnosis: Hypertrophy of the tonsils and adenoid tissue.  
 Stay in hospital of 4 days.  
 Temperature average of 101 degrees.  
 No knowledge of tuberculosis.
- Case 26:** A white soldier 22 years old.  
 Diagnosis: Chronic tonsillitis.  
 Stay in hospital of 16 days.  
 Temperature average of 99 degrees.  
 No idea of presence of tuberculosis.
- Case 27:** A black girl of 6 years.  
 Diagnosis: Phlyctenular kerato-conjunctivitis, Chronic tonsillitis, hypertrophy of the tonsils and adenoid.  
 Stay in hospital of 29 days.  
 Temperature average was 100 degrees.  
 A Wassermann test was negative.  
 A Von Pirquet test applied after microscopic diagnosis was made gave a positive reaction.  
 No gross idea of presence of tuberculosis.
- Case 28:** A black boy 4 years old.  
 Diagnosis: Hypertrophy of the tonsils and adenoid.  
 Stay in hospital of 9 days.  
 Temperature average of 100 degrees.  
 Wassermann test negative.  
 No gross idea of presence of tuberculosis.
- Case 29:** A black girl of 4 years.  
 Diagnosis: No record.  
 Stay in hospital — no record.  
 Temperature record — unknown.  
 History of case unknown.

## SUMMARY OF THE CASES

- Sex:** There were 18 females and 11 males.
- Race:** White cases, 13; black cases, 15; mestizo cases 1.
- Age:** The youngest case was 19 months old and oldest case was 39 years old.
- Occupation:** Infants under school age 12, school children 9, housewives 4, soldiers 2, sailors 2.
- Clinical Diagnoses Named in the Cases:** Some one or combination of the following were entered: Hypertrophy of tonsils and adenoids.... 18  
 Chronic tonsillitis ..... 7  
 Phlyctenular kerato-conjunctivitis ... 6  
 Hypertrophy of the tonsils..... 3  
 Otitis media. .... 3  
 Adenoids ..... 2  
 Pneumonia ..... 1  
 Hereditary syphilis. .... 1

**Duration of the Hospital Stay:**

One week or less ..	17
One to two weeks ..	4
Two to three weeks..	3
Three to four weeks	3
79 days ..	1
Unknown ..	1

**Temperature Records:**

Unknown ..	1
Normal ..	2

99 to 99.5 degrees average.....	7
100 to 100.5 degrees average....	17
101 or over .....	2

**Test Applied:**

Wassermann test positive in 1 case and negative in 4.  
Von Pirquet test applied in four cases, all positive.

Clinical knowledge of the lesion before the microscopic examination of the cases was lacking in all cases.

Present knowledge of the cases comprising the series is unknown.

**GROUP B**

(657 CONSECUTIVE AUTOPSIES)

TABLE III.

(INCIDENCE BY AGE AND RACE OF TUBERCULOUS AND NON-TUBERCULOUS CASES)

Ages	WHITE		BLACK		MESTIZO		YELLOW	
	TB	Neg.	TB	Neg.	TB	Neg.	TB	Neg.
Over 1 & under 36 months	1	3	13	147	1	14	0	0
3 to 6 years	0	2	4	14	0	3	0	0
7 to 10 years	0	0	2	5	0	1	0	0
11 to 14 years	0	0	2	5	1	1	0	0
15 to 24 years	3	7	7	19	5	18	1	1
25 to 34 years	4	6	41	55	8	25	1	3
35 to 44 years	1	10	30	66	3	10	2	4
45 to 54 years	0	8	5	39	6	8	0	1
55 to 64 years	0	7	0	13	0	5	0	0
65 and over	0	1	1	9	0	5	0	0
Totals	9	44	105	372	24	90	4	9

The youngest cases were 4 months and 5 months respectively and both occurred in negroes. There were several other negroes 11 months to 3 years of age which were positive. The oldest case was 79 years of age.

TABLE IV.

(AUTOPSY INCIDENCE OF TUBERCULOSIS OF THE TONSILS)

**Combined Races Classified by ages:**

Under 1 & over 36 months	179	cases	15	positives	8.37 %
3 to 6 years	23	"	4	"	17.39 %
7 to 10 years	8	"	2	"	25.00 %
11 to 14 years	9	"	3	"	33.33 %
15 to 24 years	61	"	12	"	19.67 %
25 to 34 years	143	"	53	"	37.06 %
35 to 44 years	126	"	32	"	25.39 %
45 to 54 years	67	"	10	"	14.92 %
55 to 64 years	25	"	1	"	4.00 %
65 years & over	16	"	1	"	6.25 %

There was only one case of tuberculosis of the tonsils which occurred in an individual that did not reveal tuberculosis elsewhere in the body.

TABLE V.

## (Distribution of Tuberculosis in the 142 Cases Autopsied)

Tuberculosis of the respiratory tract	72 cases
Tuberculosis of the respiratory tract with a general dissemination of acute and chronic lesions	45 "
Acute miliary tuberculosis, general	11 "
Tuberculous meningitis	4 "
Pott's disease	3 "
Abdominal Tuberculosis (chiefly peritoneum).	2 "
Tuberculosis of the genito-urinary system	2 "
Tuberculosis of bones and joints (spine excluded)	1 "
Tuberculous pericarditis	1 "
Tuberculous laryngitis	1 "

The three named last showed no significant extension to other regions.

There were 11 children in this series who showed only a tuberculous meningitis or this lesion with a very recent miliary extension to other regions. The oldest lesion found associated in these cases were tuberculous tonsils and in three of them old tuberculous cervical lymphadenitis as well.

The general incidence of tuberculosis of the tonsils among the 657 autopsies was 21.76%.

The incidence among the autopsies showing tuberculosis elsewhere in the body was 92.95%.

The incidence among those autopsies showing no gross lesion elsewhere in the body was .019%.

## General incidence by races:

Black race	.....22.22 %
White race	.....16.98 %
Mestizo (mixed race)	.....21.05 %
Yellow race	.....30.76 %

A gross ulceration suggestive of tuberculosis was found in 46 of the positive cases but even at autopsy a microscopic study was necessary to establish the presence of the lesion.

I (c) once analyzed 452 autopsies performed on negroes who died of tuberculosis at Ancon Hospital and in that series but 42 tuberculous tonsils were noted. Those cases did not include a microscopic examination of the tonsil unless there was a suggestion of ulceration present, therefore, the true incidence of the disease was missed.

## SOME GENERAL CONCLUSIONS

1. The incidence of tonsillar tuberculosis in the 1311 cases was 2.21%. The incidence of the lesion in the 657 autopsy was 21.76%. When one divides the autopsy series into two groups (one to contain all tuberculous individuals and the other only the non-tuberculous individuals) a startling result is obtained for those forming the tuberculous group show 92.95% of tuberculous tonsils while the other group reveals but .019%. It offers a hard subject to interpret when the two series are compared with a clinical series.

2. Distribution of tuberculosis found associated with the disease in the tonsils and adenoids is shown as follows:

## The positive clinical cases:

Phlyctenular kerato-conjunctivitis	6 cases.
Cervical lymph nodes, tuberculous	3 "
(A verbal report not in the record)	
Otitis media (possibly of a tuberculous type)	.... 3 "
Broncho-pneumonia (possibly a tuberculosis)	.... 1 "

## The autopsy series:

Tuberculosis of the lungs and intestines	..... 72 cases
Tuberculosis of the lungs with dissemination	..... 45 "
Acute miliary tuberculosis, general	11 "
Tuberculous meningitis (occurring alone)	..... 4 "
Tuberculosis of the bones and joints	4 "
Abdominal tuberculosis (peritonitis)	2 "
Tuberculosis of the G. U. System	2 "
Pericarditis (occurring alone)	1 "
Laryngitis (occurring alone)	1 "

Viewed from the standpoint of tuberculosis in infancy (clinical cases and the autopsy series) it seems probable that the following can be common extensions from a tuberculous tonsil. Cervical lymphadenitis, phlyctenular kerato-conjunctivitis and meningitis. Thoracic extensions are not improbable.

## 3. Age incidence:

The clinical series shows the lesion chiefly in children between the ages of 2 years and 6 years. The third decade also contained a good share.

The youngest case was 19 months old and the oldest case 39 years.

The autopsy series shows a high rate in infancy and then again in the adults of 25 to 45 years.

The youngest was 4 months old and the oldest 79 years.

4. Race incidence:	Clinical cases	Autopsy cases
White race	1.45 %	6.98 %
Black race	3.84 %	22.22 %
Mestizo (mixed race)	4.17 %	21.05 %
Yellow race	0.00 %	30.76 %

5. Sex incidence:

Females 18 and males 11 in the clinical group. Feature not analyzed in autopsy series.

6. Occupation:

In the clinical series, all positives occurred in infants, school-children, housewives, soldiers and sailors.

7. Temperature record and hospital stay:

The clinical cases show 19 cases with an average range of 100 to 101 degrees. The hospital stay was prolonged from two to four weeks in 12 of the cases while the others show but a day or two days longer interval than the usual time for hospitalization for a tonsillectomy.

8. Record of clinical tests performed:

One Wasserman test out of the five applied was positive.

Four Von Pirquet tests applied and all were positive.

9. Present knowledge of the condition of the positive clinical cases is not known.

10. Character of the lesion:

In practically all the clinical cases the lesion presented was one of many acute and chronic miliary tubercles scattered through the lymphoid tissue or inter-follicular regions. Some of these lesions extended into a follicle now and then but no central tubercle of a follicle was found. In many cases tubercles were found arranged about the epithelial wall of crypts. Occasional microscopic ulcers of the crypt walls were present. No fungating ulcer of an oral surface was encountered. No caseous foci such as are common in lymph nodes were found.

The autopsy series also showed the predominating lesion to be acute and chronic miliary tubercles in the interfollicular lymphoid tissue but, in addition, ulceration of the crypt wall and oral surface were rather common. Infrequent tubercles of the follicles were seen and also a few caseous foci. There were 46 of these cases with a gross ulceration of the tonsils.

It seems very likely that both primary and secondary lesions were present in this series.

The lesions found in the clinical cases are quite likely all primary cases of tuberculosis but it seems reasonable to assume that most of the cases in the autopsy series contain both primary and secondary lesions. The central position of tubercles in the follicles indicate a secondary invasion through the vascular system and it is certain that the majority of these cases were constantly covered with a film of sputum that contained tubercle bacilli from the lungs.

11. In view of the fact that so many infants show tuberculosis of the tonsils and considering the success of Mitchell (1) in recovering the bovine type of the bacillus from most of his cases, it seems reasonable to believe that infants become infected by the ingestion of milk containing the bacillus. Infants also have many opportunities of gaining the human type of the disease because they are apt to be given the privilege of spending long periods of time crawling over the floors and stuffing various dirty objects in their mouths. This type of the disease is probably at times the direct result of contact with a tuberculous mother.

12. Importance of the primary lesion in the tonsil:

It is almost certainly true that many people, perhaps most of us, have had this lesion in one or more of the many lymphoid nodules about the walls of the naso-pharynx and the root of the tongue at some time or other. There seems to be no good reason why they should not become arrested and healed in a spontaneous manner just as it seems frequently to happen in the peribronchial lymph nodes.

On the other hand, there must be a certain number of such people who suffer an extension of the disease. This extension is apt to strike first the chain of cervical lymph nodes which form a strong second line of defence that may or may not control the progress of the disease. When ever a second step in the extension occurs the case certainly becomes worthy of clinical attention. For this reason I believe that it is worth while to continue the tedious routine we have established in the histological study of the tonsils and adenoids. Because these primary lesions are silent and can not be identified by gross inspection, this method offers the best and earliest means of getting definitely in touch with a lesion that should be watched over a long enough period to determine whether it will retrogress or extend to other organs.

This routine method reveals enough other features to make it of value to the clinician.

It seems wise to draw attention to the frequent presence of *acid fast bacilli* in the tonsil crypts

which are not tubercle bacilli and which have no pathological significance. It may often cause confusion in staining sections that are to be searched for the tubercle bacillus.

13. The most important clinical features associated with tuberculous tonsils are tuberculous glands in the cervical chains, phlyctenular kerato-conjunctivitis and in rare instances a laryngitis unassociated with a thoracic lesion.

In the first two conditions excision of the tonsils and adenoids is certainly indicated.

14. All cases with a histological diagnosis of tuberculous tonsillitis should be listed for periodical examination and one of the tests for tuberculosis applied. After a satisfactory period of observation has passed the case could be dropped from the list or if there is development one is in a position to offer advice at an early stage of the extending process.

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American Journal of Tropical Diseases and Preventive Medicine, Vol. III, No. 6, pp. 331-353, December, 1915.

Note: This article is published by the Gorgas Memorial Laboratory July, 1934, because of requests for the information contained and because the article was not submitted, at the time it was read, to the Medical Association of the Isthmian Canal Zone. It therefore failed to be included in the proceedings of that organization for the year 1922. The organization has now ceased the publication of its proceedings.