THREE YEARS' SANATORIUM EXPERIENCE
OF LARYNGEAL TUBERCULOSIS.*

BY

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HISTORICAL.

WHEN the International Congress of Medicine met in London thirty-two years ago a communication was read by Krishaber of Paris, in which he announced "his firm conviction that tuberculosis of the larynx, while possibly healing in one part, yet always broke out in another, and so invariably ended fatally, generally within a year, although some cases resisted for two years." About the same time Morell Mackenzie published his well-known textbook, and in that he stated that "the prognosis of laryngeal phthisis is always extremely unfavourable, and it is not certain that any cases ever recover."¹

Since that date two important events have occurred in the history of tuberculosis: one is the discovery of the tubercle bacillus and the other is the evolution of sanatorium treatment—the former being the chief factor of progress as regards exact diagnosis, and the latter, so far, being the principal improvement in our methods of treatment.

PROGRESS.

We are nowadays able to take a somewhat less gloomy view of tuberculous laryngitis than in the days of Krishaber and Morell Mackenzie, but it yet remains a serious disease. Many medical men, unaware of the progress which has been made, are still possessed with the ideas of former days, and ask incredulously if a case of laryngeal tuberculosis is ever cured? On the other hand, there are laryngologists who, either because a few surprising arrests have come their way or because their sentiment overbalances their judgement, talk confidently of the number of cases they have actively treated and cured. I can only think that their optimism has neutralized their accuracy of observation, or that their cases have not been investigated, and that their after-histories have not been followed up with the completeness which we are able to secure at the Midhurst Sanatorium. Three years of steady work there have shown me that laryngeal tuberculosis is not necessarily the fatal disease it was thirty-two years ago; that progress may be looked for along certain lines; but that the development of lesions in the larynx is still, next to meningitis, the most serious complication of pulmonary tuberculosis. It renders the prognosis twice as gloomy as it would be otherwise, and in the majority of cases—as they present themselves at present—it is incurable.

MATERIAL.

The King Edward VII Sanatorium at Midhurst contains 105 beds. It possesses a very complete and efficient medical staff, consisting of the superintendent with his two assistants, a skilled pathologist with a well-equipped laboratory, and a distinguished visiting staff. There is therefore no difficulty in getting every case investigated most thoroughly, with full reports on the sputum, serum tests, Wassermann reaction, x-ray examinations, and so forth. The patients are drawn chiefly from a sedentary class—male and female secretaries, typists, clerks, school teachers, students, shop assistants, clergy, medical men, lawyers, officers of both services, and civil servants—but they are clean-living and intelligent patients, very obedient to instructions, and generally most anxious to assist in securing restoration of health. Every effort is made to admit only the early and promising cases. With a large waiting list there is no advantage to the institution in retaining there any but hopeful cases. I mention all these points to show that my results are drawn from favourable material treated under the most advantageous conditions. I have inspected the larynx of every patient admitted since January, 1911, and, when the throat was found affected or even suspicious, I have re-examined it

regularly once a month. In this way I have examined the throats of 795 patients. (See Table A.)

Classification.

I must here explain that a case on admission, after being thoroughly investigated, is placed in one of the three groups of the Turban-Gerhardt classification of phthisical cases. These groups correspond approximately to the description of slight, severe, and advanced disease, and are more fully defined as follows in the official proceedings of the International Tuberculosis Committee:

Group I. Disease of slight severity, limited to small areas of one lobe on either side, and which, in case of infection of both apices, does not extend beyond the spine of scapula or the clavicle, or in case of affection of the apex of one lung does not extend below the second rib in front.

Group II. Disease of slight severity, more extensive than Group I, but affecting at most the whole of one lobe; or severe disease extending at most to one half of one lobe.

Group III. All cases of greater severity than Group II, and all those with considerable cavities.

In addition, many cases are sent in with a provisional diagnosis of tuberculosis, in which a fuller examination fails to discover any active mischief, although possibly a fair proportion show old, arrested, and obsolete lung disease. These cases we are in the habit of putting together and labelling Group IV. It is possible that in other observations many such cases have gone to swell the numbers of Group I and so augment the percentage of cures, but I propose to delete these entirely from my tables and figures, which will therefore deal only with manifest cases of active tuberculosis. (See Table A.)

TABLE A: 1911-1913.

Total number of cases admitted, 795 (Males, 466; Females, 329).

	No. of Cases.	No. of Laryngeal Cases.	Percentage.
Group I	203	28	13.7
Group II	365	99	27.1
Group III	125	51	40.8
Cases of definite pulmonary tuberculosis	693	178	25.6
Group IV	102	0	—
Total cases admitted and examined ...	795		

Proportion of Laryngeal Cases.

Taking, therefore, 693 cases of active and definite pulmonary tuberculosis, the larynx was affected in 178 of these—that is, in a proportion of 25.6 per cent. Cases which were only "suspicious" have not been included in these 178, which embrace only larynges with definite tuberculous lesions. This is a high proportion, considering that we have to do with selected and comparatively early cases. I can only think that it is due to the careful look-out kept on the larynx, and that the percentage is raised by my rejection of Group IV.

Frequency in Each Sex.

This high proportion comes as a surprise, but my next statistic also tends to subvert a commonly accepted figure—I mean the relative frequency of a laryngeal complication in male and female consumptives. (See Table B.)

TABLE B.—Relative Frequency in Males and Females.

Total cases, 693.

	No. of Cases.	No. with Laryngeal Disease.	Percentage.
Males	432	104	24.0
Females	261	74	28.3
Total	693	178	

* Paper read before the Medical Society of London (see page 818).

Morell Mackenzie gives the proportion in hospital out-patients as 2.7 male for one female, and according to the *post-mortem* records of ten years at the Brompton Hospital the larynx in pulmonary tuberculosis is infected in 28.85 per cent. of females and in 56.27 per cent. of males.³ This has commonly been accepted as agreeing with the greater predisposition of males generally to throat affections, and associated with their more frequent abuse of tobacco and alcohol, and exposure to dust in workshops, mines, and factories. Now my cases, male and female, do not come from the industrial classes, and both sexes live under very similar conditions. This may account for the figures, which show that in 432 males the larynx was diseased in 104, or a proportion of 24 per cent., while in 261 females it was diseased in 74, or a proportion of 28.3 per cent. These figures are so approximate that they may be quoted as showing that, under similar conditions, the incidence of laryngeal tuberculosis is much the same for both sexes. I would also point out that my Group IV—that is, doubtful cases—consisted of 68 females and 34 males, exactly twice as many females. Women come more readily to a sanatorium than the male bread-winner, and their various forms of poor health are more apt to simulate tuberculosis. Now, these female cases in other statistics would have gone to reduce the percentage of laryngeal cases and swell the number of cures. I have disregarded them, and this, too, may explain why at Midhurst I find laryngeal disease is as common with women as with men.

Proportion of Laryngeal Cases to Stage of Pulmonary Disease.

The next group of figures is very interesting, as it gives the number of laryngeal cases according to the stage of the pulmonary condition. (In these figures both sexes are grouped together.)

The proportion of laryngeal cases in each group was as follows (see Table C):

TABLE C.—Proportion of Laryngeal Cases to Stage of Disease (both Sexes).

	No. of Cases.	No. of Laryngeal Cases.	Percentage.
Group I ...	203	28	13.7
Group II ...	365	99	27.1
Group III ...	125	51	40.8
Total ...	693	178	25.6

These figures are striking. They first of all reveal what we have not, I venture to think, sufficiently realized—namely, that even in the quite early cases of pulmonary tuberculosis the larynx is involved in the considerable proportion of 13.7 per cent. They fully confirm what we already knew—namely, that the frequency of laryngeal infection steadily increases with the advance of pulmonary disease. We see by Table C that it is twice as frequent in Group II and three times as frequent in Group III as it is in the early cases of Group I.

Mortality in Laryngeal Cases.

With the involvement of the larynx the approach of death is rapidly hastened, as shown in Table D.

TABLE D.—Mortality of all Patients (a) with Larynx Normal, and (b) with Larynx Diseased, from 1911 onwards.

	Alive at Date.	Dead.
	Per Cent.	Per Cent.
Larynx normal ...	73.5	26.5
Larynx diseased ...	49.1	50.9

I said just now that there was tubercle of the larynx in 13.7 per cent. of Group I cases; but we think tubercle in the larynx is such a momentous complication that when it is met with in even a quite early and favourable case, it is, *ipso facto*, sufficient to transfer that case into the less promising Group II. In other words, there are no laryngeal cases in Group I, and to compare laryngeal and non-

laryngeal cases together we must add Groups I and II together thus (we call cases in Groups I and II favourable and in Group III unfavourable):

TABLE E.—Mortality of Favourable Cases made up of Groups I and II.

	Alive at Date.	Dead.
	Per Cent.	Per Cent.
Larynx normal ...	84.4	15.6
Larynx diseased ...	66.6	33.3

This shows that even in the comparatively early stages of phthisis death comes half as fast again when the larynx is involved. With the unfavourable cases of Group III there is a still more rapid increase in the mortality when the larynx is involved. (See Table F.)

TABLE F.—Mortality of Unfavourable Cases in Group III.

	Alive at Date.	Dead.
	Per Cent.	Per Cent.
Larynx normal ...	46.9	53.0
Larynx diseased ...	29.6	70.8

These figures in Tables D, E, and F do not comprise my cases of 1913. It is customary at Midhurst to send out a circular in August to all the patients of the preceding year so that last year's patients will not receive their circular and we will not know how they are going on until after next August. In this way our results of lasting arrest of the disease, or of continued vitality, are more exact than in many statistics. Some cases neglect to answer, or are lost sight of, so that the figures may not correspond throughout.

Laryngeal Disease and Prognosis.

These definite and recurring statistics, in all stages of pulmonary tuberculosis, directly contradict the views expressed by some who have swung with the pendulum from the hopeless attitude of a former generation to the too cheerful outlook of some of to-day with fortunate, but possibly limited, experience. One authority has written that he does "not regard mere laryngeal involvement as in any way necessarily adding to the gravity of the patients' outlook."³ I regret that these three years' experience have led me to other conclusions, and I think it highly important that we should face these disagreeable facts, for prognosis is an important factor in practice, and the relation of laryngeal tuberculosis to the prospects of a patient have, I think, been fully demonstrated by the figures I have given.

RESULTS OF TREATMENT.

Let us now devote a short consideration to the 178 cases of laryngeal tuberculosis I have treated in the sanatorium during these last three years. It will facilitate reference and discussion if I place them in a table which will show the condition they were in on their discharge. (See Table G.)

TABLE G.—Results of Treatment of 178 Cases.

	Males.	Females.	Totals.	Per Cent.
Arrested ...	20	17	37	20.78
Improved ...	36	26	62	34.83
Statu quo ...	41	21	62	34.83
Worse ...	7	10	17	9.55
Total ...	104	74	178	

Time will not permit of a full consideration of all the details of this group, and only a few can be touched on. The first thing that strikes one, particularly when compared with the dicta of Krishaber and Morell Mackenzie of thirty-two years ago, is the large number of cases in which the disease has been arrested. In these 37 cases all evidence of a tuberculous process has been arrested,

and I have little doubt that if we could follow up the after-histories with a laryngoscopic examination of the cases discharged as "improved" we should find that a good many could be transferred to the heading of "arrested," for, unfortunately, in many cases the patients only remained some three or four months in the sanatorium—a stay too short to allow of complete healing. Such cases would more than balance any possible relapses which may have occurred amongst my "arrested" cases. The second encouraging point is that more than half of the cases—99, in fact—were either arrested or improved during their stay. The remainder—the 79 composed of cases which were unaltered or which were worse—will, I fear, all do badly. But even here it is noticeable that so many remained *in statu quo*. This is a testimony of the benefit to the larynx induced by sanatorium life—the removal from vitiated and dusty air, the suppression of alcohol, the limitation or abolition of tobacco, the vocal rest, and all the improvement in general health brought about by the regular existence, the abundant nourishment, the rest and exercise, and the other factors of the simple life under constant medical supervision. Only those who have been able to contrast the condition of the tuberculous larynx amongst out-patients—or even in the stuffy homes of many private patients—can appreciate what the sanatorium life can do for it. The congestion and catarrh subside, the dirty ulcers clean, irritation and cough disappear, and all our symptomatic armamentaria of sprays, inhalations, lozenges, powders, insufflations, paints, caustics, and intratracheal injections are uncalled for. Laryngeal cases seldom complain of anything beyond their huskiness and the silence and abstinence from tobacco prescribed for it. Without local medication the sanatorium existence prepared the larynx for curative treatment in over 50 per cent. of my cases. It is regrettable that we are not yet armed with more directly curative measures, and that, even if we were, the general condition of the patient in the remaining cases would render them useless.

Spontaneous Arrest.

Of these 37 cases of arrest of tuberculous laryngitis, healing took place in 22 instances without any direct treatment. Silence, more or less complete, is now such a routine measure that I need not lay stress upon it. Its use was the only addition made in these 22 cases to the usual routine of sanatorium treatment. (See Table H.)

TABLE H.—Arrest of Laryngeal Disease.

In 178 Cases.			
Without local treatment	...	...	22 cases
With use of galvano-cautery	...	...	15 "
Total arrested	...	...	37 cases=20.7%

The Galvano-Cautery.

In the remaining 15 cases cicatrization was brought about by the use of the galvano cautery (see Table I). This was applied in 36 cases. Of the 21 cases which have escaped the rubric of "arrest," 3 are still under treatment, 8 had only one application shortly before the end of their stay, and all the others left the sanatorium as "improved" or "nearly cicatrized." The cases were very carefully selected, and in no instance could any harm, general or local, be traced to the use of the galvano-cautery. Two advanced cases made decided progress towards healing in the larynx, but died from their pulmonary lesions several months after their discharge.

TABLE I.—Treatment with the Galvano-Cautery.

In 178 Cases.	
Applied in 36 cases,	or 20.22 per cent. of all cases.
Arrest in 15 cases,	or 41.66 per cent. of cases treated.

Tuberculin.

Tuberculin was used in a good many cases, but I cannot say that I observed any marked beneficial results. In two or three instances some improvement was noticed, but I propose to defer discussion of this.

Local Surgical Measures.

Local surgical measures were employed in only two cases—in one to clear away heaped-up deposit on a ventricular band and allow the galvano-cautery to act on the margin of

the infiltration (the case was cured); and in another—also arrested—to remove some of the superfluous pachydermatous granulation tissue resulting from the cauterization.

Local Palliative Treatment.

Local palliative treatment I do not propose to consider at all. We seldom have any call for it at Midhurst Sanatorium.

CONCLUSIONS.

It is rash to draw up any but the most guarded conclusions in such a variable and chameleon-like disease as laryngeal tuberculosis, but my regular and close observation of the patients admitted to the King Edward VII Sanatorium during the three years 1911-13 have suggested the following:

1. The larynx is frequently involved in pulmonary tuberculosis. Even in the selected cases sent to the sanatorium it is met with in 25.6 per cent.

2. A considerable number of cases (102 out of 795) are sent to a sanatorium without their showing active tuberculosis. These cases, if included in statistics, would largely help to invalidate the foregoing conclusion.

3. In patients of the middle class laryngeal tuberculosis may be met with as frequently in females (28.3 per cent.) as in males (24 per cent.).

4. Laryngeal tuberculosis occurs much more frequently (13.7 per cent.) in the early favourable cases of Group I than is generally recognized.

5. In the more decided cases of Group II this proportion is doubled (27.1 per cent.), and in the advanced cases of Group III it is trebled (40.8 per cent.).

6. The expectation of life amongst consumptives is markedly decreased by the complication of laryngeal tuberculosis.

7. As a factor in prognosis the laryngeal condition deserves much more regard than it has hitherto commanded.

8. Laryngeal tuberculosis may not infrequently be present, although the patient may make no complaint of the throat, and although the voice be unaltered. Hence:

9. The larynx should be carefully inspected in every case of pulmonary tuberculosis.

10. Improvement in lung and larynx frequently, but not necessarily, progresses *pari passu*.

11. In certain cases the larynx improves, while the lung retrogrades. The converse rarely takes place.

12. Arrest of laryngeal tuberculosis can be effected in a sanatorium in 20.7 per cent. of all cases (see Table H).

13. Limited and slight laryngeal lesions, particularly in Groups I and II, may become arrested spontaneously with sanatorium treatment.

14. The galvano-cautery is the best weapon we have at present for local treatment. It was only indicated in 20.22 per cent. of 178 cases (Table I), and it completed the cure in 41.60 per cent. of the cases in which it was employed.

15. These satisfactory results have not, so far as I know, been secured by any methods outside a sanatorium.

16. Sanatorium treatment is at present the first and most valuable method we have for arresting laryngeal tuberculosis.

17. Local measures are much more promising under sanatorium conditions.

18. At present, in many cases, the diagnosis of tuberculosis is too long delayed, or the patient is sent to a sanatorium much too late to effect a cure. Hence:

19. With our present therapeutic resources we must, to get better results, urge the importance of early diagnosis, and then prompt sanatorium treatment.

REFERENCES.

- ¹ *Diseases of the Throat and Nose*, vol. i, p. 383, London, 1889.
- ² S. H. Habershon, *Journal of Laryngology*, December, 1905.
- ³ P. Watson-Williams, *ibid.*, November, 1911, p. 606.

THE report presented to the fifty-sixth annual general meeting of the Royal Dental Hospital, Leicester Square, stated that 19,769 new patients had been treated during the year; the attendances numbered 56,603, and the operations 107,927. There had again been an increase in the anaesthetic cases, the number of patients in that department being 14,167 during the past year. The debt on the building is now £34,247, and the yearly payments of principal and interest on the mortgage amount to £2,580 11s. 2d.