LARYNGEAL TUBERCULOSIS

By TH. RÜEDI (Davos)

GENTLEMEN,—I heartily thank you for the honour you have given Davos by your visit, and in the name of my Davos colleagues I have great pleasure in bidding you welcome.

I have particular pleasure in talking to you about my experiences of laryngeal tuberculosis, as it was British medical men who carried out pioneer work in this field. In a treatise on diseases of the larynx published in 1826 by the Dublin surgeon Porter, we find tuberculosis mentioned as the most common affection. In 1840, Liston made observations of the larynx by means of a small mirror previously immersed in hot water, and in 1847, Horace Green published a monograph on topical treatment of the larynx. In 1854, the Spanish singer, Manuel Garcia, who was living in London, performed the first laryngoscopy on himself with the aid of two mirrors and direct sunlight. Finally it was Marcet of London, the precursor of modern endo-laryngeal surgery, soon to be introduced, who in 1869 spoke concerning surgical treatment of laryngeal tuberculosis. Time does not permit me to relate the valuable work performed by the past and present British laryngologists.

I do not intend to speak concerning the pathology and clinical aspects of laryngeal tuberculosis, as this is well known to you all, but I shall devote this paper to my laryngological work for the past thirty years in Davos, and to my experiences of a large number of cases of laryngeal tuberculosis, with special reference to the ætiology, course, prognosis, and therapy of the disease.

I. Ætiology

You have probably noticed the intermittent onset of laryngeal tuberculosis. In spite of having positive sputum for years, a patient may remain free from laryngeal tuberculosis, but one day the disease makes its appearance in an interesting manner. On studying the medical histories of a few cases, I have noticed that it coincides with activity in a pulmonary focus and develops into a circumscribed, localized laryngeal tuberculosis.

* Paper read to the Visiting Association of Throat and Ear Surgeons of Great Britain.

https://doi.org/10.1017/S0022215100043887 Published online by Cambridge University Press

This fact is important from the point of view of ætiology and prognosis, as it shows that the laryngeal complication should not be considered as a new extra-pulmonary localization of tuberculosis only, but, also in its benign form, as evidence of aggravation of a pulmonary focus.

Generally, it would appear to-day that there is still some belief in the old Louis theory of infection of the larynx by the sputum, with the exception of those cases in whom an acute hæmatogenous general infection of the larynx follows an acute, febrile, hæmatogenous relapse of the pulmonary condition.

The following observations and research go to show that laryngeal tuberculosis can, almost exclusively, be regarded as being either lymphogenous or hæmatogenous in origin, the benign types probably being the former, and the malignant types being the latter :

1. The intermittent appearance of the disease.
2. The fact that one larynx never becomes infected by tuberculosis, in spite of positive sputum for years, and another becomes infected in a case of closed pulmonary tuberculosis.
3. From my observations I find that cicatrized cases of tuberculous laryngitis often remain healed in spite of the sputum again becoming positive.
4. The results of my statistics, which show that in 515 patients from the local public sanatoria, 59 per cent. had laryngitis catarrhalis simplex, and only 14 per cent. showed signs of tuberculous laryngitis, in spite of Louis's assertion that a catarrhal condition of the laryngeal epithelium renders it receptive to contagion.
5. Blumenfeldt's plausible explanation of the fact that laryngeal tuberculosis localizes itself with preference to the interarytenoid surface, owing to the slowing up of the lymph stream in this locality.
6. The fact that endogenesis and not contagion must be considered in cases of middle-ear and nasal tuberculosis, otherwise the pharynx and epipharynx would be more often involved than is the case.
7. The new immuno-biological conception of the tuberculosis problem, and the results of recent researches into the spread of extra-pulmonary tuberculosis to the bones and urogenital system, as well as to the serous membranes through the dissemination of bacilli *viâ* the blood stream.

https://doi.org/10.1017/S0022215100043887 Published online by Cambridge University Press

Laryngeal Tuberculosis

II. The Course of the Disease

The course of the disease of the two chief groups of laryngeal tuberculosis, the benign and the malignant form—the uni- or multi-focal,—more or less circumscribed and localized form—and the generalized, diffused,—infiltrative and ulcerated or disseminated miliary form—are well known to you. The clinical character of laryngeal tuberculosis can usually at its onset be determined as benign or malignant, and usually follows the character of the primary pulmonary process. The forms of the first group can remain stationary for a long time, or heal spontaneously—personally I have often seen this—or, under the influence of a pulmonary relapse, they may become active through spread of the focus in its length and depth. Ulceration of the arytenoid prominence and the processus vocalis may then cause unpleasant surprises, as it may attack the arytenoid perichondrium and the crico-arytenoid joint in the angle of the arytenoid and the false vocal cords, which is not easily seen and which usually means a bad prognosis. On the other hand I have often seen how the laryngeal process improves, either by itself or helped by surgical measures, when the pulmonary tuberculosis becomes inactive.

Among the patients in Davos during the last years, malignant generalized laryngeal tuberculosis has increased in comparison with the benign forms. Many patients come to us now in a more advanced stage than previously. Fortunately, however, in these cases I have, here and there, seen a favourable tendency to healing. Of the hæmatogenous generalized forms, the cases in which there is no miliary pulmonary process have the best chance. We are powerless against the generalized laryngeal condition combined with miliary pulmonary tuberculosis. Where a larynx, in spite of the best treatment and conditions, becomes worse and worse, there is, in my experience, reason to suspect miliary pulmonary tuberculosis.

The following are two examples :

1. In the middle of the winter 1910, a 39 year old patient came to Davos after a year's treatment in Belgium and on the French Riviera. The right lung was badly infiltrated, and the left to a lesser degree. There was also a generalized, infiltrated, ulcerated condition of the larynx with dysphagia and aphonia. Shortly after his arrival here, it was necessary —*indicatio vitalis*—to perform an electro-cauterization on this dysphagic, febrile, and undernourished patient. The patient

https://doi.org/10.1017/S0022215100043887 Published online by Cambridge University Press

stood the intervention better than was expected, and there was a prompt decrease in the dysphagia, which allowed better nourishment. After two years' sanatorium treatment in Davos, combined with numerous electro-cauterizations of the larynx, the patient could be sent home clinically cured. He now remains in good health to-day, twenty-seven years after his arrival at Davos, first of all thanks to the first electro-cauterization made on grounds of *indicatio vitalis*.

2. A young, healthy Swiss woman, with a good medical history, contracted bi-lateral tuberculosis of the upper lobes during pregnancy. In the spring of 1933, generalized, infiltrative, ulcerated tuberculosis of the larynx and pharynx made its appearance in three febrile attacks. She came to Davos where climatic sanatorium treatment, without collapse—or immunization therapy, prevented further spread of the disease. With the help of ultra-violet light therapy, and, later, careful electro-cauterization of the ulcerated pockets and vocal cords, in the course of a year the larynx and pharynx cleared up. The lung process became inactive during this time, and the patient remains in good health to-day.

III. Prognosis

The two cases mentioned before show that even in the grave forms of laryngeal tuberculosis a definitely unfavourable prognosis should not be made. Alpine climatic treatment, supplemented by modern lung-surgery, certainly allows a much better prognosis to be made to-day. Many cases heal spontaneously through the good effects of treatment on the pulmonary condition, and others can be healed by the electro-cautery. Therefore, the prognosis is more favourable than it seemed some time ago. But at the same time we should avoid being unduly optimistic. We must remember that although tuberculosis has a great tendency to heal, it also shows a great tendency to relapse, following the fluctuations of the condition of immunity; that there is a certain connection between the course of laryngeal and pulmonary tuberculosis; and that the appearance of laryngeal complications is evidence of a lowering of the immunizing activities of the organism and an activation of the pulmonary process. The prognosis of pulmonary and laryngeal tuberculosis depends, in the first place, upon the constitution, but the age of the patient also plays an important rôle. It seems in general that laryngeal tuberculosis in

https://doi.org/10.1017/S0022215100043887 Published online by Cambridge University Press

patients of 30 to 40 years of age has a better prognosis than that in young people and children. In the latter cases I have not often noticed laryngeal disease complicating pulmonary tuberculosis. I have recently examined the larynges of 34 sanatorium patients varying in age from 4 to 18 years. In 22 of these cases there was open pulmonary tuberculosis, the remainder were closed cases which were formerly open.

In 3 cases the larynx was normal.

In 28 cases there was chronic, simple catarrh of the larynx.

In 2 cases (8 and 12 years of age) ulcerative laryngeal tuberculosis, and in 1 case (17 years of age) there was spontaneous cicatrization. This latter case had been seen by me 1½ years previously for ulcerative laryngeal tuberculosis.

Therefore the prognosis, even in children and young people, is more favourable as it generally seems, especially if these types, as it is the case with us, come for climatic sanatorium treatment in conjunction with lung surgery.

In general, cases of circumscribed, localized tuberculosis of the cavum laryngis follow a benign course, but the best cases are those of pure infiltrative or ulcerative tuberculosis of the vocal cords. These cases can usually be cured permanently by the effect of treatment in the high altitudes, modern pulmonary surgery and endo-laryngeal cauterization. The worst prognosis is found, as you have already heard, where miliary tuberculosis appears. Somewhat better, but still grave, is the prognosis in the infiltrative, ulcerated generalized form. Isolated infiltrative and ulcerative tuberculosis of the epiglottis, when not limited to a circumscribed, marginal focus—has also a bad prognosis. In cases of diffused infiltration of the epiglottis or of stenosed strictures due to a contracted epiglottis cicatrix, one should not forget to eliminate syphilis as a possible complication.

IV. Therapy

The prejudice against climatic treatment of laryngeal tuberculosis in the high alps, which one finds occasionally to-day, dates back to the old time when only the advanced cases came for examination and treatment, and to the early days of sanatorium treatment in the alps, when a commercial medical superintendent, in order to obtain the best possible statistics for propaganda purposes, only accepted suspected cases of laryngeal tuberculosis in his sanatorium, and

https://doi.org/10.1017/S0022215100043887 Published online by Cambridge University Press

manufactured contra-indications to climatic treatment in advanced cases. In this respect there is to-day no doubt that cases of laryngeal tuberculosis with dysphagia and debility should not come to the mountains. Their metabolism cannot react in a way necessary for climatic treatment, therefore they derive no climatic stimulation, and the dysphagia is aggravated by the cold, dry air. In the many other cases capable of reaction, alpine climatic treatment alone, or helped by modern pulmonary surgery and especially by electro-cauterization, produces the best results, which is proved by the many cases which have obtained permanent recovery in Davos.

Experience obtained over several decades in our alpine sanatoria has shown that the chief aim of pulmonary treatment, —the promotion of immuno-biological activity of the organism —is best obtained by clinical sanatorium treatment in the best possible alpine climate, such as at Davos. As the same immuno-biological laws apply to both larynx and lungs it is clear that the same conditions can apply equally to the treatment of laryngeal tuberculosis. When we consider the connection between the course of laryngeal tuberculosis and pulmonary tuberculosis, it is easily seen that the former should not be treated as a disease in itself—let us say in a laryngological clinic in the lowlands—but should be treated in conjunction with pulmonary therapy in an alpine resort under close co-operation between the lung specialist and the laryngologist. This is the *first postulate* which, many years ago, I laid down for the treatment of laryngeal tuberculosis.

Unpleasant experiences at the beginning of my laryngological activities in Davos taught me that endo-laryngeal cauterization before the pulmonary focus had become inactive, lead to an undesired activity of the pulmonary condition, whereas the same intervention in cases of inactive pulmonary tuberculosis was well supported, and led me to lay down *my second therapeutic postulate*, namely : laryngeal cauterization—urgency excepted—only in cases of inactive pulmonary tuberculosis. Urgency for intervention occurs when a laryngeal ulcer causes an irritating, tormenting cough, or when dysphagia threatens life and the usual narcotic therapy fails.

Having regard to my two postulates, my therapeutic procedure is as follows :

A. *For the severe to malignant cases* with generalized laryngeal tuberculosis of a diffuse, infiltrative or ulcerated, or of a

https://doi.org/10.1017/S0022215100043887 Published online by Cambridge University Press

disseminated-miliary form, with perichondritic complication (usually there is in question the bedridden, cachetic, febrile patient with irritating cough, dysphagia, excessive sputum and difficult expectoration) : *For these cases, only symptomatic therapy :* pappy nourishment, narcotics, local anæsthesia, ultra-violet light or X-rays (the latter 10-15 per cent. HED), ice-packs, phenol inhalations, atropine pills (0.001 gm. twice daily). In the case of a painful arytenoid ulcer or arytenoid perichondritis 85 per cent. alcohol into the superior laryngeal nerve ; eventually partial or total resection of the epiglottis with epiglottis forceps.

B. *For the benign forms* with one or more circumscribed infiltrative ulcerative foci on the inter-arytenoid surface, the arytenoid prominence, the border of the epiglottis, on the interior surface of the epiglottis, on the vocal cords or false vocal cords : Where there is good general health, it must be stated whether the pulmonary condition is still active or not.

I. *The pulmonary condition is still active*, but the larynx

(*a*) *without pain :* Wait for the effects of climatic and surgical pulmonary treatment. Eventually phenol inhalations, and silence for cure of affection of the vocal cords. In the pure, or for the most part, infiltrative types, X-ray therapy (20 per cent. HED 4 to 6 times) or intravenous Solganal B, both are to be recommended. The four cases of stenosis of the glottis, which I have observed in over fifty cases treated with Solganal, cannot be ascribed to the Solganal, but to a perichondritis arytenoidea complication. This one I saw occasionally before the Solganal era. The general arc-lamp treatment of the Finsen Institute, Copenhagen, has not been used by the Davos medical men, owing to the danger of causing a breaking down of the pulmonary process. I have never seen any good results from immuno-therapy ;

(*b*) *with local pain :* local anæsthesia and in urgent cases *local electro-cautery.*

II. *In cases of inactive pulmonary tuberculosis :*

(*a*) Wait and control the course of laryngeal recovery, eventually with the aid of local conservative

https://doi.org/10.1017/S0022215100043887 Published online by Cambridge University Press

measures which I mentioned before, or Solganal or X-ray therapy.

(*b*) Where recovery is delayed—which is not seldom—or where a disturbing cough is caused by an ulcer, or where a painful ulcer persists in spite of everything, or where lack of time and money necessitates more rapid therapeutic measures, *endo-laryngeal operative therapy* must be carried out.

I do not recommend the Killian Suspension Method for endo-laryngeal operations, as it causes too much exertion on the part of a sensitive patient suffering from tuberculosis, and even a diagnostic laryngoscopy by this method may bring about a rise of temperature, and, finally, it has no greater technical advantage over the indirect method.

I do not even recommend curative tracheotomy, as the long period during which the cannula has to be worn has usually an unfavourable effect on the pulmonary process. For obvious reasons, laryngo-fissure and laryngectomy will rarely be considered.

The double curette was often used in Germany for endo-laryngeal operative treatment. This cutting instrument, however, is not suitable, as its use results in open wounds, and it does not get down deep enough. Personally, I use a spiral platinum burner of various shapes and sizes, as I find that this instrument is suitable for all laryngeal conditions. It can be applied to the various surfaces, prominences, and recesses with equal facility and the depth effect can be regulated as desired. Brought to almost white heat, it carbonizes the tissue over a required surface. Hæmorrhages, such as are seen in a deep stab cauterization of the false vocal cords, do not occur. Before cauterizing an arytenoid ulcer, I inject the superior laryngeal nerve with alcohol, this very much reduces post-operative pain. It sometimes happens that a false vocal cord must be destroyed right up to the ventricle of Morgagni. Cauterization of the vocal cords requires considerable practice. I prefer to do the operation by sunlight so that I can measure exactly the difference of levels. After the cauterization, owing to the inflammatory reaction, the patient should be put on inhalations and silence. Whispering should be forbidden, as it only causes fatigue and leads to a droplet infection of the surrounding parts. Cauterization of the vocal cords is one of the finest physiological-psychological triumphs of the *ars medici*. It brings

https://doi.org/10.1017/S0022215100043887 Published online by Cambridge University Press

about healing of severe ulcers of the vocal cords, restores the voice to a patient who has been hoarse or aphonic for months or years, gives him back his earning power, and allows him again to take his place in society.

Finally, an example which may be of interest.

A German author, aged 32, who was at Davos in 1916 for treatment of pulmonary tuberculosis, returned at the end of 1922 with a relapse of the pulmonary condition and total aphonia. He was refused treatment for the laryngeal condition by three German clinics. The man was destitute and relied upon his works to earn his living, therefore everything depended upon his regaining his voice.

I treated the bi-lateral, deep, tuberculous ulcers of the vocal cords by means of three cauterizations. The laryngeal condition healed in three months, the patient had again a loud voice, and was able to earn his living by reading his works for four years. He then died suddenly from pneumonia.

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In dieser Arbeit berichtet Verf. über seine Erfahrungen in Davos während der vergangenen 25 Jahre, Er begründet seine Ansicht, dass die Miterkrankung des Kehlkopfs entweder lymphogenen oder haematogenen Ursprungs ist und nie das Ergebnis einer Oberflächeninfektion durch Sputum. Er unterscheidet zwei Gruppen der Erkrankungen: die gutartige oder umschriebene von der bösartigen oder allgemein ausgebreiteten Form. Nach seiner Ansicht ist die letztere in den letzten Jahren häufiger geworden. Er hält dafür, dass eine Behandlung im Gebirge zusammen mit sorgfältig angewandter Elektrokauterisation von grösstem Wert ist und gibt Beispiele von Fällen, die trotz ausgedehnter Erkrankung durch diese Behandlung geheilt wurden.

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Dans cet article, l'auteur rapporte ses observations à Davos pendant ces dernières 25 années. Selon sa manière de voir, la complication laryngienne serait soit d'origine lymphatique soit d'origne sanguinaire et ne serait jamais due à l'infection par les crachats. Il classifie la maladie en deux groupes: celui qui est localisé et bénin et celui qui est localisé et malin. Il estime que ce dernier a augmanté pendant ces dernières quelques années. L'auteur insiste sur la très haute valeur de l'air alpestre associé au traitement judicieux par l'électrocautérisation et cite plusieurs cas avancés qui ont été guéris par ces méthodes.

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