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TUBERCULOUS LARYNGITIS.*

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THE subject of tuberculous laryngitis which I have been asked to discuss is such a large one that it will only be possible, in the time at my disposal, to give you a short résumé of present-day opinions in regard to some of its most important aspects.

Frequency.—Without going into a number of available and reliable statistics, it may be stated that in one year about 320,970 patients suffer from pulmonary tuberculosis in England and Wales, and as one in three of these will have a laryngeal complication it means that 106,900 will require relief or cure of this local subinfection. Everyone with any experience of laryngeal tuberculosis knows that it is only the early and relatively limited lesions which offer a prospect of cure, and it is for this reason that I shall limit my remarks to these phases of the disease and dwell in detail on the signs and symptoms of them for which the general practitioner should be on the alert.

Let me say how indebted I am to my friend Sir StClair Thomson for permission to make use of the statistics and other information which appeared in his Mitchell Lecture on Tuberculosis of the Larynx, delivered before the Royal College of Physicians on Nov. 6th, 1924. He has also placed at my disposal some excellent illustrations on tuberculous laryngitis.

Sex Incidence.—When exposed to similar conditions in their everyday life, both sexes are equally liable to laryngeal tuberculosis.

Causation.—As already intimated, the laryngeal lesion is a subinfection derived from a primary focus in the lung. It would be unwise to deny the possibility of an initial laryngeal infection in the presence of sound lungs—e.g., by the inhalation of dried, air-borne particles of tuberculous sputum—but I cannot recall having seen such an instance during 25 years study of diseases of the larynx. One must also remember that a small primary focus in the lung may defy detection by the ordinary "physical signs" and that radiography may equally fail to reveal it. Nor is it in accordance with experience that nurses and doctors on duty in sanatoriums are prone to direct laryngeal infection.

Paths of Invasion.—The bacillus of tubercle most frequently enters the laryngeal tissue by way of its mucous membrane and, either through a minute abrasion of the epithelium, or by actual penetration between its individual cells. It would be reasonable to expect that infection would most readily occur in those situations where bacillus-laden sputum tends to collect and stagnate—i.e., where epithelium is non-ciliated and also, as Jobson Horne's researches proved—where mucus-secreting glands and lymphatics are abundant. Clinical observation entirely confirms these views, for in order of frequency the following regions are those in which the laryngoscope enables us to detect the earlier signs of tuberculous infection.

1. The posterior commissure of the larynx, which includes the interarytenoid area, the anterior surface of the arytenoids and the vocal processes. In these situations we find non-ciliated epithelium or lymphatics or both.
2. The vocal cords with stratified epithelium.
3. The ventricles of Morgagni and ventricular bands, rich in lymphatics and mucus-secreting glands.
4. The epiglottis, especially its free border and the laryngeal aspect of its petiolus.

It has also been maintained that the bacillus may reach the laryngeal tissues by the blood stream or by the lymphatics. This might seem to explain those cases in which infiltration or pseudo-œdema exist, or antedate, any visible ulceration. But here again we must not forget that tubercle bacilli can penetrate *between* epithelial cells and reach deeper structures without causing a visible superficial lesion at their site of entry. This has frequently been observed in the tonsils and in the mucous membrane of the intestinal tract, in the one case the cervical glands and in the second the mesenteric glands may be affected. Furthermore, if blood-borne infection be frequent, it would seem strange that from the commencement to the end of pulmonary tuberculosis the larynx should be often the only organ to provide evidences of subinfection.

Whichever be the path of infection, once the tubercle bacillus has entered the submucous tissues of the larynx, it acts as an irritant and causes cell proliferation with eventual formation of the typical giant cells of the tubercle nodule. These induce localised inflammatory infiltration with a pseudo-œdematous appearance. Later on a coalescence and caseation of the nodules take place and these rupture through the epithelium, causing the production of the characteristic superficial mouse-nibbled tuberculous ulceration. As the

* A Lecture delivered before the Fellowship of Medicine on Nov. 30th, 1925.

disease progresses on the surface and into the deeper tissues of the larynx granulation tissue appears, and ultimately perichondritis, ulceration, and necrosis of cartilage may take place. Sometimes the granulation tissue may be so localised as to form a definite tumour—tuberculoma—but, as a rule, it is more widely distributed and, because it has a tendency to ulcerate and break down, it is uncommon to meet with severe or dangerous degrees of stenosis of the glottis.

THE EARLIER SIGNS AND SYMPTOMS OF LARYNGEAL TUBERCULOSIS.

Probably one of the most frequent symptoms is an alteration in the voice. This may vary in degree from slight gruffness to almost complete aphonia, and it may be temporary in duration or very persistent. Another early symptom is discomfort or pain in the throat or larynx. It is important to bear in mind that tubercle may invade the larynx and cause a very obvious lesion without this being accompanied by any loss of voice or unusual sensations—e.g., a tumefaction of the interarytenoid fold or a ventricular band, or swelling of the free portion of the epiglottis.

The lesson to be learnt from such experiences is that in all cases of pulmonary tuberculosis a periodical laryngoscopic examination should be made—for only in this way can be discovered the earlier signs when these precede the symptoms of infection.

In regard to disturbance of vocal function I should like to emphasise the importance of temporary loss of the voice, especially in young tuberculous patients. It is so easy to fall into the error of regarding such cases as of functional origin when the patient is a female. Frequent attacks of aphonia, which are not cured by the faradic current and which occur in subjects of indifferent health, should always suggest a careful examination of the lungs, and the more so if cough is a predominant symptom and the palatal and laryngeal mucosa are anæmic and hypersensitive to examination. If the alteration of the voice is found to be associated with congestion of one vocal cord, such a combination is very suggestive of tuberculous infection.†

In the well-established and later stages of extensive tuberculous laryngitis, the chief local symptoms are loss of voice, pain on swallowing or expectorating, cough, and excessive secretion of mucus. The local appearances are generally easy to recognise—viz., infiltration, pseudo-œdema, superficial ulceration, and the formation of granulation tissue. Any one or more of these morbid changes may predominate in the individual case.

Occasionally, however, it may tax the diagnostic acumen of the most experienced laryngologist to differentiate between tubercle, syphilis, and malignant disease of the larynx. The difficulty is likely to arise when, in a robust-looking patient, the pulmonary lesion is quiescent and the laryngeal

lesion takes the form of a tumour or a chronic localised infiltration, perhaps hiding an ulceration or suggesting an underlying perichondritis. Such cases not infrequently come before the Laryngological Section of the Royal Society of Medicine, where the exhibitor "asks for opinions as to diagnosis."

On one such occasion I asked for this help from my colleagues in the case of a man whose general health and appearance were excellent, but whose hoarseness was caused by a tumour on the left vocal cord. All who examined the case agreed it was an epithelioma. A few days later I opened the larynx and on touching the growth it was soft to the feel, and this at once made me suspect we had made a mistake in diagnosis, because an epithelioma of the size of the lesion I was dealing with would have been hard in consistence. The tumour was removed, but soon afterwards the incision in the neck broke down and tubercles appeared in the granulation tissue. Meantime the microscope revealed its tuberculous nature of growth. The neck wound soon healed and the patient left the hospital. Two years' later he returned with pulmonary symptoms and died. The post-mortem revealed old and more recent lesions of pulmonary tuberculosis, but healthy cicatricial tissue occupied the site of the original laryngeal "growth."

PROGNOSIS.

This may be regarded from three points of view
1. The prospect of a cure of the laryngeal lesion.
2. The influence of laryngeal tuberculosis in regard to mortality.
3. Its effect on pregnancy and vice versa.

1. As a general rule, if the lung mischief can be arrested and the patient's general condition improved, a limited laryngeal lesion will also tend to heal under appropriate treatment. But as Sir StClair Thomson has pointed out, such a parallel course of progression (or retrogression) is not constant, and he makes the observation that while disease in the larynx may be cured the pulmonary trouble may advance, yet the reverse never occurs—i.e., with an extension of laryngeal disease the pulmonary mischief "cannot possibly become arrested, and soon makes progress."

2. The influence of laryngeal tuberculosis on the final issue of the disease is one for serious consideration because the local complication is always of grave moment. Let me give you one or two facts which I have taken from the lecture already referred to. Sir StClair Thomson says:

"Of the 2541 patients with pulmonary tuberculosis who were discharged from the King Edward VII. Sanatorium, Midhurst, between 1911 and 1921, the proportion of those alive between one and ten years later was, amongst those with a sound larynx, double that of those with tuberculous laryngitis. Of patients found to have tubercle in the larynx during those ten years, two out of every three were dead. Of those with a sound larynx two out of three were alive. Of all the 477 cases which passed through my service at Midhurst between 1911 and 1921 no less than 70.5 per cent. are now dead."

Sir StClair Thomson goes on to give figures which show that the presence of laryngeal infection

† Lantern slides and epidiascopic pictures were shown to illustrate the favoured sites of infection and the commoner types of lesions met with in tuberculous laryngitis.

darkens the prognosis in all stages of the disease. Furthermore, that the outlook of a slight pulmonary lesion with laryngeal infection is poorer than that of severe lung disease with a sound larynx. That is the gloomy side of the picture, but under the more modern methods of general and local treatment he reports 119 cures of healed tuberculous laryngitis—i.e., in 25 per cent. of the total which came under his care.

3. Pregnancy and Tuberculous Laryngitis.—The combination of these conditions is rare, but when it does present itself it is of the nature of a tragedy, because the effect of pregnancy on the laryngeal lesion is extremely pernicious both to the mother and child. Of 231 cases collected by Kuttner 200 died during or shortly after confinement. From a careful study of the subject he draws the following conclusions :—

1. The complication of laryngeal tuberculosis and pregnancy is of relatively rare occurrence.

2. Diffuse tuberculosis of the larynx during pregnancy indicates a most unfavourable prognosis. The later the first symptoms appear the better the prognosis, *ceteris paribus*.

3. Laryngeal mortality is exceedingly great in cases where the mother has suffered from laryngeal tuberculosis during pregnancy.

4. Among the wealthy the prognosis for the mother is somewhat more favourable, for the child markedly so.

5. Local and general therapy, as treatment in a sanatorium, may now and then meet with success, especially in mild cases. In a serious affection, however, such as is met with in by far the larger number of cases, the termination of the disease is averted only very rarely by this means.

6. Tubercular tumours of the larynx are relatively harmless, and show no tendency to develop into a diffuse infection during pregnancy.

In such cases, then, the advisability of inducing abortion or premature labour will have to be considered, and each case will demand individual and careful consideration of the pros and cons for such interference. If, for example, it is fairly certain that any attempt to save the mother is likely to fail, then abortion should not be induced, but confinement delayed as long as possible in the interest of the child.

If the laryngeal affection is slight and the general condition is good, pregnancy may be allowed to continue so long as the laryngeal lesion does not increase or show any sign of activity. Further, pregnancy should not be interfered with if the laryngeal symptoms develop during the later months, for premature labour in such a condition would severely tax the resources of the mother, whereas the local symptoms may quickly abate after a full-time confinement.

If the laryngeal symptoms show a tendency to increase during the first half of pregnancy, gestation should be interrupted in the hope of saving the mother's life, which experience teaches would otherwise be in great jeopardy. We should have the less hesitation in advising it when we remember that under such circumstances the life of the child will almost certainly be lost.

In coming to a conclusion as to the advisability of interrupting gestation we must take into account

all the circumstances of the case—e.g., general health, vigour, examination of lungs, larynx, sputum, family history, course of her disease, and the financial position of the patient.

PRINCIPLES OF TREATMENT.

It is obvious that if laryngeal tuberculosis is to be cured our first aim must be to arrest the progress of the primary lesion in the lung, and at the same time to adopt any treatment which may benefit the larynx. It is generally accepted that only the régime of a sanatorium will fulfil these ends, and it should be adopted at once and at all costs.

With regard to the larynx, functional rest of the vocal cords is the first and most important factor in treatment. Obviously it cannot be complete, because we cannot prevent the respiratory excursions of the cords, but by the enforcement of whispers or absolute silence the most active movements of the intrinsic structures of the larynx can be avoided, and it is only right to recall that Sir StClair Thomson was the first to urge the adoption of physiological rest. This can be brought about by the patient employing only the whispered voice, or by observing the trying ordeal of complete silence. Such vocal rest may have to be carried out for months.

"Out of 119 cases which were cured, the healing was obtained without other local treatment than voice rest in no fewer than 73 instances." (Sir StClair Thomson.)

If improvement results, but comes to an end short of actual cure, galvano-puncture of the local lesion may bring about the desired result by inducing a local fibrosis. By such means we copy Nature's own method of destroying or rendering inert the tubercle bacillus. According to the extent of the lesion one or more punctures and séances may be necessary. The little operation can be carried out in the patient's home if and when necessary; it is free from risk, involves little pain, and can be performed generally by the indirect method. Anæsthesia is induced by the local application of cocaine.

At the summer meeting of the Laryngological Section of the Royal Society of Medicine I showed a patient whose laryngeal lesions had been cured by rest of the voice and galvano-puncture. But for the small scars the larynx appears to be normal and her voice is equal to the daily strain of a school teacher. Her primary lung trouble is quiescent, but has shown periods of activity on two or three occasions during the past 17 years; and at such times treatment at the Midhurst Sanatorium has arrested the mischief.

TREATMENT BY FINSSEN LIGHT.

Probably in the near future we shall find this a useful addition to our armamentarium for the treatment of laryngeal tuberculosis. Dr. Strandberg, of Copenhagen, reported the results of more than nine years' experience of this method, to the Laryngological Section of the Royal Society of Medicine last year. He claimed 53 per cent. of cures.

One of the most interesting and striking features of his reports was that in many instances (77 per cent.) the patients were very poor, lived in their homes during treatment, and their disease was of an advanced type. Furthermore, they continued their occupation while under treatment. Probably his percentage of cures would have been higher if hospital or sanatorium advantages had been available during the Finsen bath treatment and particularly if this had been limited to the mild and earlier type of laryngeal tuberculosis. I have had no personal experience of this treatment, but with some of my colleagues had the advantage, last spring, of seeing the method applied in a hospital in Antwerp. The results appeared excellent and full of promise.

When laryngeal tuberculosis enters upon its more extensive and advanced stages the prospect of cure is scarcely worth serious consideration, if for no other reason than that the lung trouble is beyond repair. All we can do is to relieve pain on swallowing, cough, and other attendant sufferings. It is difficult to conceive of a more cruel ending of human life than that of a patient in the late stages of pulmonary tuberculosis with an extensive laryngeal complication. Speech is painful and swallowing is often an agonising effort. In the intervals between these acts cough permits no respite from the lancinating pain in the larynx which often radiates to the ears. Much as the patient would like some nourishment, this is limited to bare necessity because of the pain produced by the act of swallowing. Hence, and as a result of all the forces against him, it may truly be said that death becomes a long-felt want.

How can we help these sufferers on the down slope? There are two drugs which assist pre-eminently in many cases of dysphagia—viz., "orthoform," which produces local anæsthesia when applied to an ulcerated surface, and "anæsthesin," which acts on the unbroken mucous membrane. A combination of these should be blown from an insufflator on to the diseased areas of the larynx about 15 minutes before any attempts to take food. Some patients can be taught auto-insufflation of the powders. In milder cases pastilles containing the drugs are more convenient than the powder. Should these remedies fail to reach the ulcerated areas or lose their effect, sensation of the larynx may be destroyed by injecting the superior laryngeal nerve trunk from without just before it enters the thyrohyoid membrane. The solution used is 2 gr. of beta-eucaine in 1 oz. of 80 per cent. alcohol.

Finally (and it is, in my opinion, the only circumstance in which radical surgery should be employed in a tuberculous larynx), certain painful areas can be removed with punch forceps and often with very great relief to suffering. Twenty-five years ago I removed a patient's tuberculous epiglottis which was causing great dysphagia. He is still alive and well and every Christmas Day sends me a card of greeting. I ought to add that after

the operation he led an open-air life based on sanatorium régime. Similar results have resulted from galvano-puncture, submucous injections of guaiacol into the swollen arytenoids, &c. For 20 years I have not applied any chemical caustics to tuberculous lesions of the larynx.

In so far as the laryngeal disease may be the cause of cough—and it is a symptom which should be relieved when it becomes excessive or painful—I have found dry inhalations very useful—e.g., of tr. benzoin co., or a combination of creosote, carbolic acid, iodine, spirits of ether and chloroform—especially in the presence of profuse secretion of mucus, and the same benefit may result from intratracheal injections of a 5 per cent. solution of menthol in benzoinol. When these fail, and sooner or later they frequently do, morphia, heroin, and the other derivatives of opium come into their kingdom, and while they should be used with discrimination and judgment, these virtues should not so predominate as to strain the quality of mercy.

ADAPTATION

SUCCESSFUL AND UNSUCCESSFUL.*

BY

H. CRICHTON-MILLER, M.A., M.D. EDIN.

MAN comes into the world with certain congenital qualities, physical and mental. From the cradle to the grave he is exposed to an environment which makes certain demands upon him. The extent to which he adjusts his passions and desires to these demands, and the degrees in which he maintains internal harmony and social efficiency are the measure of his psychological adaptation. The neurotic, the delinquent and the insane constitute the three great groups of unsuccessful adaptations. It is with the first of these groups that we are primarily concerned in this course.

EVOLUTIONARY CHARACTER OF ADAPTATION.

The process of adaptation is essentially a dynamic one and evolutionary in character. We regard man as slowly and painfully fighting his way from his simian origin as "an instinct-driven mechanism" towards a divine destiny. Every step that he takes in this direction is characterised by some extension of conscious purpose in his life, and a compensatory restriction of direct instinctive reaction. But it must not be thought that purpose is in itself a dynamic; the dynamic is always the same—instinct. The introduction of purpose into human life allows of a great range of modification of conduct. This modification implies the process of sublimation, in other words, the application of instinctive energy to some cognate end which has value for society. Human purpose may be ego-centric or altruistic.

* Being the substance of a Lecture delivered on Nov. 16th, 25, at the Tavistock Clinic.