

mentioned before, in the so-called parasyphilis of the larynx, or in those cases that do not respond to mercury and potassium iodid treatment, salvarsan often changes the condition so that mercury and potash do have beneficial effects. Since syphilitic laryngitis is usually not a painful affection, one need not employ any general remedies for relief. The local treatment may be divided into topical applications, semioperative and operative.

Beginning with the possibility of making a diagnosis of a primary chancre of the larynx, one may practice what the genito-urinary specialists have successfully done with chancre on the penis; this is to resect the chancre, especially if it be localized on the epiglottis. In the early stages of erythema, papules and condylomas, the local application of calomel or iodol insufflations are very agreeable, mild solutions of silver nitrate or argyrol, steam inhalation, and mild alkaline sprays, are also indicated, especially when the secretions are excessive. The rest to the voice is very beneficial. In the broken-down infiltrations or gummata, it is necessary frequently to cleanse the surfaces by laryngeal irrigations or swabs, followed by application of stronger solutions of silver nitrate or iodoglycerin solution. The same is true in the broken-down nodular and perichondritic type. When the concomitant edema is present then frequently multiple punctures of this edematous membrane give marked relief. In the severe forms of perichondritis with abscess formation pointing externally, an early incision externally will prevent further extension or greater embarrassment to breathing. In all forms of the later stages of laryngeal syphilis, when considerable swelling is present, one must be constantly watching for the possibility of having to perform a tracheotomy, and in very severe forms of dyspnea it is frequently better not to wait till the last moment, but do a tracheotomy beforehand.

The management of the end-results of the ulcerated forms of laryngeal syphilis will depend on the condition present. The direct method of laryngoscopy, especially by the aid of suspension, offers great aid in the treatment of multiform cicatricial deformities and obstructions. Incisions of bands and resections of cicatricial masses with subsequent dilatation, either by the old Schrotter's dilators, directly by Jackson's dilator or bougies, or the wearing of the new O'Dwyer tube, as recently recommended by Mayer and Jackson, will no doubt give very satisfactory results. If, however, the interior of the larynx be markedly obstructed, especially following severe forms of perichondritis, with abscess formation in which a greater portion of the cartilages have sloughed away, then a laryngostomy will give the only permanent relief.

DIAGNOSIS AND TREATMENT OF LARYNGEAL TUBERCULOSIS

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In discussing the subject of tuberculous laryngitis I take it that it is not expected that time shall be expended in dwelling on the more obvious and well-known forms of the affection, but that some of the things learned from experience in the earlier, less marked lesions would be more profitable.

Those practicing in a place like Colorado Springs where there are many consumptive patients, encounter more cases of larynx involvement than do those who

work in communities in which consumptives are relatively few; and we thus have perhaps more opportunity to see and study these cases.

I think, however, that patients with pulmonary tuberculosis are not as a rule subjected to systematic laryngeal examination early enough or often enough even in health resorts and sanatoriums. If this is done, it results in the discovery of many cases of incipient disease of the larynx, and appropriate treatment may be instituted at a time when such treatment is most effectual. The doctrine that early diagnosis enhances the prospect of a favorable outcome of treatment is perhaps just as true in this disease as it is when we are dealing with lung tuberculosis.

DIAGNOSIS

At the outset, let us not forget that primary laryngeal tuberculosis is an exceedingly rare disease, and further that not every case of hoarseness or even laryngitis in a tuberculous patient is necessarily due to tuberculosis of the larynx. Tuberculous persons may have simple catarrhal laryngitis or syphilitic or cancerous disease of the larynx, and the differentiation is not always an easy matter, especially in the beginning.

Hoarseness, pain (spontaneous and on swallowing, and shooting up to the ears), infiltration and ulceration of a typical appearance are the classical signs and symptoms of tuberculous laryngitis, and need not be described here; but a patient may have the disease and not be hoarse, as for instance, in a case of slight ulceration of the epiglottis or some other part of the larynx not directly concerned in phonation. I do not refer to that peculiar quality of the voice which may be described as "weakness" (for lack of a better term) which practically all sufferers from pulmonary tuberculosis present. This is probably due to a lack of vigor of the muscles of phonation and is a part of the general muscular atony. It differs from the hoarseness of tuberculous laryngitis as much as does the raucous voice of a syphilitic larynx. I have in mind two cases, in one of which the lesion was confined to a small and atypical ulcer on the left wall of the interior of the larynx above the false cord; in the other, the left side of the tip of the epiglottis was ulcerated and a slight infiltration developed later. In the first case, absolutely no pain and only the slightest huskiness was complained of; in the second, no hoarseness but merely a sense of discomfort in the throat was observed.

Then the sign of pallor of the mucous membrane which is given in most text-books as one of the diagnostic features of laryngeal phthisis is from my observation a very unreliable index, for the color depends on the complexion of the patient and the hemoglobin content of the blood. Pallor has no significance in this connection unless localized in the throat. I am aware that this is not an original discovery of mine, but I cannot forget my disappointment and perplexity during my early experience in not finding it always.

A sign which has seemed to me to be so constantly present that I attach great importance to it is a thin line of mucopus which lies in the posterior commissure and extends up and over the top of the interarytenoid region. I have thought that this might be due to a localized inflammation or ulceration in the subglottic region. This is, of course, attended by other indications of laryngitis.

Redness of one cord, the appearance of the other remaining normal, is almost diagnostic of tuberculous laryngitis in a tuberculous person.

I have often noticed a slight infiltration of the epiglottis—not the characteristic enormous thickening, but

a sort of clumsy-looking, blunt-edged organ in a larynx showing distinct but early signs elsewhere—which I have suspected may be a true tuberculous infiltration, though it has not always developed into the characteristic type.

In the differential diagnosis we must consider simple catarrhal laryngitis, pachydermia, syphilis, carcinoma and possibly posticus paralysis, rheumatic arthritis of the crico-arytenoid joint and laryngitis sicca.

As mentioned before, a tuberculous person may have a simple catarrhal laryngitis, and it may be impossible to say at first that it is not the beginning of a local tuberculous process. It is only by observing the further course of the disease as to whether or not the condition soon clears up that a correct opinion can be formed. Every affection of the larynx in a phthisical patient should be regarded with suspicion, and the case kept under close supervision. A laryngitis which does not clear up promptly should be regarded as probably tuberculous; later on the characteristic signs will be discovered in most cases.

A pachydermia of the posterior wall sometimes strikingly resembles the granulating edge of a tuberculous ulcer in this situation, and pachydermatous areas may also become infected with the Koch bacillus. The differentiation may be very difficult; but the finding of an ulcer either by inspection or by the presence of blood on a swab with which it has been wiped, together with the discovery of lung tuberculosis, will lead us along the right track. Typical tuberculosis in other parts may be required to establish a diagnosis.

In laryngitis sicca the crusts may adhere so tenaciously and look so much like a tuberculous deposit that it is not possible from appearances alone to make a diagnosis. Injection of warm water or oil and clearing of the larynx by coughing will nearly always remove them.

As between syphilis and tuberculosis the chances of error have been greatly reduced since the Wassermann reaction has been in vogue and salvarsan discovered. In this connection it should not be forgotten that a mixed lesion is present in many cases, and we should be on our guard in a case of either one that the presence of the other is not overlooked. I have notes of a case in which a diagnosis of tuberculous laryngitis was made in a woman with a history of pulmonary and hip-joint tuberculosis. Later a characteristic skin syphilide was discovered and under antiluetic treatment the larynx rapidly healed except in a comparatively small area, which remained obstinate. This was most probably a case of syphilis of the larynx on which a tuberculous infection was grafted. Moritz Schmidt reports a case in which tuberculosis, syphilis and carcinoma were all present in the larynx of the same patient.

The distinction between carcinoma and tuberculosis of the larynx, especially of the tumor form, offers difficulties at times. Lagging of the affected side on phonation in carcinoma, the appearance of the lesion sometimes, and the age of the patient help to differentiate it. A tuberculin test is of great value, particularly if the local reaction in the larynx is looked for. Microscopic examination of an extirpated piece is in most cases decisive.

Unilateral posticus paralysis occurring in a person with pulmonary tuberculosis might be mistaken for a tuberculous perichondritis of the arytenoid with ankylosis of the crico-arytenoid joint; but the tumefaction and infiltration of the tissues would be absent in the former affection.

Rheumatism of the crico-arytenoid joint is, in my experience, a rare occurrence, and would therefore not often be a factor in the differential diagnosis. Furthermore, in rheumatism we would expect to find other joints involved.

TREATMENT

I am a firm believer in the idea that laryngeal tuberculosis ought to be thoroughly and persistently treated. I have no patience with the view that it might just as well be left alone because occasionally a patient recovers spontaneously or because these patients are doomed anyway. The results of Schmidt, Heryng and a host of others prove that much can be done by appropriate treatment to add brightness to the prognosis in these cases.

Of first importance in the treatment is the proper care of the lung condition, because it is almost axiomatic that with a progressive lung disease little improvement can be expected in the process in the larynx. Therefore appropriate climatic environment, and proper supervision of the patient's daily life, habits, food, sleep and rest are basic essentials, together with such other therapeutic measures as seem necessary. In this connection the care of the appetite and digestion is of supreme importance. It has been well said that one's chances for recovery depend on a sound stomach. Tuberculin in suitable cases is useful, although I have observed no direct beneficial effect on the throat from its use.

Cough is a source of much irritation to an inflamed larynx, and should be controlled as far as possible by the voluntary efforts of the patient and attention to the upper air-passages, and subdued, if necessary, by narcotics, such as heroin or codein; the deleterious effects of these drugs on the appetite and digestion must at the same time be kept constantly in mind.

Talking causes as much irritation to the larynx as coughing, and except in those cases in which the lesion is so situated as not to be affected by its movements when phonating, speech should, as a rule, be interdicted. There are patients, however, who seem not to be able to exist if they are put on a strict "silence cure." They are born with a "gift of gab," have no resources of entertainment within themselves and get blue and melancholy if kept away from associates. With such persons the physician must use sound discretion and permit a limited amount of speech—perhaps require them to converse in whispers. He must remember always that he is treating a human being and not regulating a piece of inanimate machinery.

The relief of painful swallowing is just as essential from the point of view of maintaining a high degree of nutrition. No matter how hungry the patient may be he is not going to take a sufficient quantity of food if the effort is accompanied by excruciating agony. The local application of analgesics such as orthoform or anesthesin, either in powder or emulsion, is very useful. When the pain arises from lesions below the epiglottis, alcohol injections of the superior laryngeal nerve in some cases give complete relief lasting sometimes for days. Pain due to ulceration of the epiglottis can be relieved by amputation of this structure as emphasized by Lockard.

A great number of remedies have been used as local applications for the cure of laryngitis, prominent among them being lactic acid, formaldehyd solution, trichloroacetic acid, Lake's mixtures, etc. I suppose each of us tries out many of them and then settles down to a few which seem efficacious. For my part I have felt that I have had best results from the use of liquor formaldehydi and trichloroacetic acid. The former is of most value in

infiltrations, used in strength of from 3 to 10 per cent. and thoroughly rubbed in, while the latter is reserved for ulcerations, applied in saturated solution at intervals of from seven to ten days. Both of these drugs find their greatest field of usefulness in cases which are not suitable for surgical measures; that is, in patients with active tuberculosis who are running high temperatures, or who have extensive involvement of the larynx or those whose equilibrium is too much upset by the thought of "cutting." The application of sunlight or Roentgen rays directly into the larynx are measures with which I have not had experience, but which I do not believe offer much if any advantage over the local application of drugs. Freudenthal speaks rather enthusiastically of fulguration, but I have seen no reports of its effects other than his original article.

We now have to consider a branch of the therapy which I believe is in suitable cases the most valuable aid in combating this affection. I refer to surgical measures. Ever since Heryng and Moritz Schmidt, a quarter of a century ago, began advocating surgical treatment of laryngeal phthisis, there has been at no time a complete accord on this proposition; and yet those men consistently adhered to their contentions, and the results have justified their faith. I feel convinced from the experience I have had with it that in properly selected cases it is the one best method of local treatment. Let no one, however, regard this plan as being universally applicable in all cases. He who does so will inevitably come to grief. But given a case of not too extensive involvement, with a quiescent lung, with a temperature of not over 100—in short, a patient who exhibits a fair amount of resistance to the tuberculous invasion—and favorable results may be confidently expected together with a shortening of the time required to bring the results about. Isolated tuberculomas or vegetations, moderate infiltrations and ulcerations, especially in early cases, are particularly responsive to the curet, the laryngeal punch or the galvanocautery. I have many times seen a tuberculous infiltration and ulceration of the posterior wall, which had for weeks and months resisted the application of various pigments and escharotics, yield promptly to the use of the punch, followed by lactic or trichloroacetic acid. The cautery point is of much service in massive infiltrations of the false cords when the use of the double curet is perhaps unsafe.

Surgery is sometimes indicated also as a palliative measure. I recall the case of a young girl who had extensive involvement of the larynx and whose dysphagia was so great that she refused absolutely to swallow anything, even water. She was doing badly in every way and seemed altogether an unsuitable case for surgical interference. The case was desperate, however, and with the hope of affording some relief, a quantity of the offending mass was removed. The result was most happy. The patient was able to swallow with comparative comfort, her general condition, in consequence of the improved nutrition, improved and, while the ultimate result of the case was never in doubt, the temporary relief was well worth while.

Many cases of laryngeal tuberculosis arise in far-advanced cases of phthisis in which the prognosis is absolutely bad; yet even in these unfortunate cases surgery has a place. For instance, in dysphagia from ulceration of the epiglottis, when amputation of this structure is often followed by the greatest relief. Lockard says that this operation is indicated in any case, however bad, simply as a method of relief from suffering.

Tracheotomy and laryngofissure have been advocated as curative measures, although they seem to be too heroic to be adopted in any but a small minority of cases. Still there can be no doubt that tracheotomy does often exert a favorable influence on the disease by putting the larynx at rest. As an illustration, I refer to the following case: I performed a tracheotomy four years ago on a young man who had for several years been suffering with lung tuberculosis and whose larynx was quite extensively involved. As a result of increasing and extreme stenosis the tracheal opening was necessary to prevent suffocation. Neither his regular attendant nor I expected him to live three months. He disappeared from observation shortly afterward and I thought he had gone to his reward. Much to my surprise he walked into my office two years later with his larynx perfectly healed and with a good but slightly husky voice. He is still alive and his larynx remains well, although he will in all probability eventually succumb to the disease in his chest, which is quite extensive.

CONCLUSIONS

1. Sufferers from tuberculosis should have their throats examined early and often, and persistent vigorous treatment should be instituted at the beginning of trouble in the larynx.
2. Proper attention to the general condition is one of the prime essentials.
3. Surgical intervention in appropriate cases offers by far the best prospect of permanent relief, and not infrequently is of much value as a palliative measure.

The Colchester.

DIAGNOSIS AND TREATMENT OF PARALYSIS OF THE VOCAL CORDS

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In the diagnosis of laryngeal paralysis, one must remember the normal functions of the muscles and their nerve-supply. There are four pairs of muscles on each side which act alike and one single muscle acting on both sides at once. These are supplied by two pairs of nerves, the superior and the inferior or recurrent laryngeal nerves. Remember, the superior laryngeal nerve supplies all of the motor muscles on the outside of the larynx, consisting of just one pair, and sends no motor filaments to any other muscle. It is the sensory nerve for the whole laryngeal mucosa. All of the other laryngeal muscles are supplied by the purely motor recurrent laryngeal nerves.

The external (cricothyroid) muscle, which is supplied by the superior laryngeal nerve, regulates the tension of the cords and it is very rarely paralyzed. Paralysis of sensation is always due to involvement of the same nerve. Nearly all cases of paralysis of the vocal cords, and every case in which the outward and inward movements of the cords are interfered with, fall within the domain of the recurrent nerves.

The muscles supplied by the latter nerve may be grouped as abductors and adductors. The crico-arytenoideus posticus on each side is the only muscle concerned in abductor paralysis; therefore, all of the others, that is the crico-arytenoidei-laterales and the arytenoideus are adductors; the thyro-arytenoidei are also