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DEMONSTRATION OF CASES AND SPECIMENS

IN THE THROAT DEPARTMENT OF BROMPTON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.

BY

SIR JAMES DUNDAS-GRANT, K.B.E.,
M.D. EDIN., F.R.C.S. ENG.

THE cases with which I have to deal are those of tuberculosis of the larynx and diseases simulating or mistaken for it. My demonstration of these will be concerned with the appearances revealed in life by the laryngoscope. I hope with the aid of diagrams to explain the laryngoscopic appearances and make their interpretation clear.

POST-MORTEM APPEARANCES.

I shall commence by showing you the diseased conditions in specimens from the museum, and a few microscopic sections of portions removed for diagnostic or other purposes. So many of the points here detailed are to be found in the accompanying reproduction of a larynx described by the late Mr. Lennox Browne and myself and drawn by him for the *Archives of Laryngology*, that I cannot do better than include it in this place. It has been beautifully reproduced in the later editions of Lennox Browne's text-book, published by Messrs. Baillière, Tindall and Cox (Fig. 1). The specimens demonstrated and referred to by number may be studied in the museum of Brompton Hospital.

The main features of tuberculosis in the larynx are the ulceration and the infiltration. The characteristic feature of the *tuberculous ulcer* is its comparative shallowness, the indistinct punctate

appearance of the floor, and the crenate shape of its outlines. Its extension is on the surface rather than in its depth. Its appearance suggests that of a "moth-eaten" piece of cloth. This is well seen in the drawing (Fig. 1, a) and in several of the specimens.

Thus, in specimen No. 13, the right vocal cord is occupied by a typical "moth-eaten" ulcer, and in No. 19 both vocal cords and the inter-arytenoid space are involved, forming a complete "ring" of ulceration. A very frequent site of ulceration is the inter-arytenoid space, as shown in No. 29. When this is looked at from above, the upper edge appears like a feebly developed irregular thickening. This is often the earliest sign which presents itself to the laryngoscopist and it is usually continued upwards on the inner surface of the arytenoid bodies (Fig. 1, b), where from the foreshortening it is scarcely visible in laryngoscopy. The ulceration sometimes assumes the form of a longitudinal slit in the vocal cord (No. 8) and below the cord (No. 11.5 and Fig. 1, c). An extension in depth occurs in a very special region—namely, the posterior part of the vocal cord (in the widest sense) and the tissues around the vocal process and arytenoid cartilage, while the posterior part of the ventricle (Fig. 1, d) probably contributes to the formation of the cavitation. This is well marked in the drawing, and is seen in No. 25, in which the perichondritis has led to necrosis of the upper part of the arytenoid cartilage. This condition is often found in advanced stages of the disease when by means of the probe a rough loose fragment may be detected. With this there is always a considerable amount of thickening which extends along the vocal cord. In life the mobility of the cord is much diminished. The epiglottis often escapes till a later stage, but several of the specimens show it affected by very typical ulceration. It is seen in a very superficial form in the drawing (Fig. 1, e).

The ulcer is preceded by a greater or less amount of *infiltration* producing a thickening of the parts which may be general, as in specimen 2.6, or limited as, for instance, to the ary-epiglottic folds in some other specimens (and in Fig. 1, f). The infiltration is generally solid, smooth, and opaque, but often it has an oedematous look as if permeated by a serous fluid. In reality such oedematoid portions are found on microscopic examination to be definitely tuberculous. In one of our specimens the oedematous appearance has been preserved in spite of long sojourn in the preservative fluid. You will observe that in most of the cases in which there is extensive tuberculous infiltration of one half of the larynx there is obvious involvement of the other half as well (specimen No. 18 and Fig. 1).

FIG. 1.

Post-mortem appearances of a case of laryngeal tuberculosis (Lennox Browne and Dundas-Grant).

By contrast with this, specimen No. 1, of extensive epithelioma of the right half of the larynx, shows the ary-epiglottic fold of the opposite side quite free from infiltration. This disparity is sometimes recognisable by laryngoscopy and suggests that the advanced disease is non-tuberculous but possibly cancerous or syphilitic. In the specimen (W-) removed during life, the right ary-epiglottic fold preserved its normal contour for a considerable time in spite of the enormous amount of cancerous disease in the rest of the larynx.

The combination of *ulceration and infiltration* provides the most typical appearances, and they vary much in proportion. We may have masses of infiltrated (tuberculous) tissue projecting from

areas of ulceration (Fig. 1, g). Such outgrowths may issue from the ventricle and conceal the vocal

FIG. 2.

FIG. 3.

Laryngeal appearances of same case as Fig. 1 (at different stages of the disease) (Lennox Browne and Dundas-Grant).

cord. In No. 22 the left vocal cord is almost entirely eaten away and its site is overhung by a cushion of tubercular infiltration growing from the ventricle. This condition is sometimes a source of difficulty in laryngoscopic diagnosis. The ventricular bands are often the site of combined infiltration and ulceration, as in Nos. 34 and 51 and Fig. 1. It is probable that the ventricles are often locally infected before any definite signs of the condition are visible, as from the nature of the coughing act, sputum must often be caught in them and the contained bacilli allowed to implant themselves in the mucous glands with which the ventricles are plentifully supplied. The first sign is probably a swelling of the ventricular band which covers the outer part of the vocal cord and makes it appear abnormally narrow. The subcordal region appears in these specimens to be involved in a larger proportion of cases than is generally supposed—3 out of 14—and confirms my belief that I detect infiltration and superficial ulceration there with comparative frequency.

LARYNGOSCOPIC APPEARANCES.

In the *laryngoscopic* picture we have in general a foreshortened view of the parts, and ulcers of which we see the upper edge may, therefore, be, and usually are, more extensive in the downward direction than they appear to be. Again, the image is distorted in such a way that what is in front in the patient is above in the mirror. The manipulation of brushes, probes, forceps, or other instruments, and especially the galvano-cautery points, must, therefore, be conducted with this relation kept persistently in view. *Experto crede!* It is well to remember that when we compare the laryngoscopic appearance with what we see when we examine the post-mortem specimen, whereas when we look into the patient's throat from the front we usually inspect the dead larynx from behind, thereby transposing the right and left sides.

In *laryngoscopy* we should look first at the epiglottis, then the ary-epiglottic folds, the interarytenoid space, the vocal cords, and ventricular

bands, and the anterior commissure. After what I have told you, you will look to the subcordal region, which often requires a slight tilting of the mirror, first to one side and then to the other when the patient takes a breath after phonation.

I will not here offer you any details as to laryngoscopy, as you will find them elsewhere, but I think as helpful a description as any of you could wish will be found in a little brochure which I prepared for Messrs. Davidson and Sons to supply with their model larynx, illustrated by Mrs. Davidson under my guidance.

The chief conditions to look for are infiltration and ulceration. I have shown you the infiltration in the post-mortem specimen, and in life you will recall its characters when it presents itself. It may involve chiefly the ary-epiglottic fold on one or both sides, producing in its complete symmetrical form a couple of pear-shaped swellings, the promin-

Case of Tertiary Gumma.—Mrs. —, aged 39, had suffered from hoarseness and pain on swallowing for two or three months. The laryngoscope revealed a dull red swelling of the right ary-epiglottic fold on the posterior part of which was a sharpish edge as of the upper margin of an ulcer. The movement of the cord was defective. The rest of the larynx was normal. Apart from the local source of suffering the patient presented the appearance of excellent health. The diagnosis was made of tertiary syphilis rather than tuberculosis and this was confirmed by a positive Wassermann. After a week's treatment with iodide of potassium the local lesion had greatly improved and the general health was perfect. At the present time the larynx appears absolutely normal. If the case had been one of tuberculosis there would, as the result of the administration of iodide of potassium, have been a decided expectoration in which bacilli would probably have been detected (Fig. 5).

In cancer the proliferation is most unruly, and the fungation when it breaks through is so vigorous that it overflows the margins of the breach of surface, producing the characteristic everted edge.

FIG. 4.

Tuberculosis of larynx (diagrammatic).

FIG. 5.

Tertiary syphilis of larynx (diagrammatic).

FIG. 6.

Cancer of larynx (diagrammatic).

FIG. 7.

Tuberculosis of larynx simulating epithelioma (diagrammatic).

ence of the little cartilages of Wrisberg and Santorini (associate "Santor" with "centre" to remind you that the latter are nearer the middle line than the former) being lost in the general swelling (Figs. 2 and 3).

The epiglottis, when infiltrated, may acquire the sausage shape traditionally ascribed to it in the text-books. Remembering that the infiltration is the result of small round cell proliferation, due to the irritant action of the bacillus *under* the surface of the mucous membrane, taking the form of minute "tubercles," you will realise that their perforation of the membrane takes a punctate form. The coalescence of these small points of ulceration gives rise to the moth-eaten appearance of these ulcers as seen in the specimens. I have already referred to the shallowness, the superficial extension, and the comparative flatness of the margins (Fig. 4).

To compare such an ulcer with that of *tertiary syphilis* there is in the latter a circumscribed area of infiltration which breaks through and is extruded *en masse*, leaving a deep "punched-out" ulcer with a sloughy floor and sharp overhanging edges. This character is often quite unmistakable and distinguishes it from tuberculosis. The distinctive characters of the tuberculous, gummatous, and cancerous ulcerations in the larynx are indicated in the accompanying diagrams (Figs. 4, 5, and 6).

This excessive fungation often overhangs the surrounding part far beyond its site of origin. It may, however, leave the hidden parts quite normal and, as I have shown you in the specimen, you may be helped in your diagnosis by the visible portion of the opposite half of the larynx appearing normal. It could hardly do so if the disease was tuberculous of such an advanced stage as to produce distortion of the image (Fig. 6).

MICROSCOPICAL APPEARANCES ON BIOPSY.

I propose now to draw attention to a few *microscopical sections* of portions of tissue removed for examination, showing typical tuberculosis and one or two of other conditions, particularly epithelioma, to compare with them. The practical interest attaching to these is that they have made it possible to clinch the diagnosis in cases that were somewhat obscure, and in several instances had been incorrectly diagnosed.

The most usual error is to mistake tuberculous disease of the larynx for epithelioma and vice versa, and this has happened even to laryngoscopists of undoubted eminence who have opened the larynx to remove what they took to be epithelioma for which this is the proper treatment, and have found the condition to be one of tuberculosis for which this treatment is generally most undesirable. Again, cases of epithelioma have been mistaken for tuber-

culosis and the disease allowed to progress till the time for successful operation was completely or nearly past.

Such errors may in many cases be avoided by the removal of a portion of the diseased tissue for microscopical examination, as some of the sections

affection. The microscopical appearance is unmistakable tubercle and has led us to insist on a continuance of treatment without which he would have undoubtedly succumbed, whereas he has with care reached the age for a pension which there is every probability of his enjoying for a considerable

FIG. 8.

Tuberculous tissue with typical giant-cells. (Previous diagnosis, epithelioma.)

FIG. 9.

Basal-celled carcinoma. (Previous diagnosis, tuberculosis.)

I have to show you will prove. The following are cases with some interesting episodes.

Case of Tuberculosis of the Larynx Simulating Epithelioma. Biopsy.—The man, aged 46, but looking much older, complained of hoarseness, pain in swallowing, and debility. His chest signs were very insignificant and no bacilli could be found in the sputum. He would hardly tolerate examination, but his larynx showed infiltration of the left ventricular band and deepish ulceration (Fig. 7). He came to this hospital, where I made a diagnosis of tubercle in spite of the unilateral character of the disease. He then disappeared but presented himself later at the Cancer Hospital, the diagnosis of cancer having been made outside. He there came under my care, and after blocking the left superior laryngeal nerve by alcoholic injection I was able to remove a portion of tissue from the infiltrated and ulcerated part. This under the microscope proved to be definitely tuberculous (Fig. 8).

Case of Epithelioma of the Larynx Simulating Tuberculosis. Diagnosis by Biopsy. Laryngectomy.—M. S., aged 29, came here for treatment as a case of tuberculosis with hoarseness of several years' duration. There was an exuberant outgrowth in the region of the right ventricular band and vocal cord, the opposite half of the larynx, so far as could be seen, being fairly normal. The visible outgrowth suggested the everted margin of a malignant ulcer, and a portion removed for examination presented the typical appearance of basal-celled epithelioma. The disease was too extensive for thyrotomy and I removed the entire larynx three years ago. To-day she is, as you see, enjoying good health and free from any sign of recurrence (Fig. 9).

Another microscopical section is from the ventricular band of a stalwart ex-policeman who had successfully battled against a pulmonary

time. There is no abnormality in his larynx except the slight fullness of the right ventricular band.

The question of epithelioma often arises, and is very urgent in view of the success attending early operation. Fortunately, in this disease the microscopical data are usually very clear, and a positive result is definitive. In tuberculosis the data are sometimes very indefinite. Epithelioma is probably the condition which lends itself best to the immediate rapid freezing method. This examination of removed tissue is called *biopsy*, and though it has its contra-indications, it is often the means of saving the situation, as in the case in which laryngectomy had been carried out. The microscopical appearances are shown in section (Fig. 9).

CLINICAL CASES.

Case of Epithelioma of the Right Vocal Cord.—F., aged 35, who is here to-day in good health and with a useful though hoarse voice, came to this hospital in October, 1923, on account of hoarseness ascribed to laryngeal tuberculosis. A portion of outgrowth from the right vocal cord extending to the anterior commissure and to a slight extent on to the left cord was found to be epitheliomatous. By means of thyrotomy, with Chevalier Jackson's modification for such extensive lesions, I removed the growth with the whole of the right vocal cord and most of the left. The present voice is probably produced by the ventricular bands. The man is well and free from recurrence.

Case of Extreme Dysphagia Relieved by Galvano-cautery.—W., aged 35, complained of discomfort of the left side of the throat and hoarseness since the war. The laryngo-

scope shows extreme infiltration of the left ary-epiglottic fold and ventricular band as well as a fleshy outgrowth from the ventricle hiding the vocal cord, of which the edge is only seen on inspiration. There is also a typical ulcer on the under surface of the epiglottis. He has suffered greatly from pain when swallowing but is most emphatic in his statement that the galvano-cautery gives him immediate relief. There are bacilli in the sputum, but the lung condition is said not to be far advanced. He uses Leduc's tube with anæsthesin and orthoform powder and for the "dryness" of his throat in the night he gargles with a solution of bicarbonate of soda—a simple but very valuable proceeding.

The method of using Leduc's tube (as illustrated in Fig. 10) is well shown by this patient, in whom you can see that the white powder has passed into the larynx and adheres to the ulcerated areas.

Case of Far Advanced Tuberculosis.—Martha C. is extremely pale and emaciated with cough and intense pain in swallowing. There is an extreme degree of infiltration of the ary-epiglottic folds and the epiglottis and on the latter the typical "moth-eaten" ulceration which extends on to the ventricular bands (Fig. 11). She is obviously too weak to react favourably to any caustic treatment and, therefore, we have to be content with such palliatives as the inhalation of anæsthesin and orthoform.

Case of Tuberculosis with Ventricular Outgrowth.—H. U., a man aged 29, has been under sanatorium treatment. His larynx presents thickening of both ventricular bands and a growth sprouting from the anterior two-thirds of the right ventricle. The growth at the present time has considerably decreased in size, apparently as the result of three galvano-cautery treatments at intervals of a fortnight. There is a nodular swelling on the inner aspect of the right arytenoid cartilage (Fig. 12).

Case of Extreme Hoarseness from Rhinitic Laryngitis.—S. G., a middle-aged man, has for many months suffered from such extreme gruffness and occasional loss of voice

(Since the above was written I have removed a small hyperplastic outgrowth in the inter-arytenoid space, and the voice has become almost normal.)

The *penetration into the larynx of fluids inhaled through the nose* was demonstrated by the slow injection of about a drachm of oil of sweet almonds containing one part of eucalyptol in 20 and tinted with a trace of methylene blue. The patient threw his head back, kept his mouth open, and breathed actively through it *without swallowing* while the oil trickled back. It is easy to see with the laryngo-

FIG. 11.

Tuberculous infiltration of ary-epiglottic folds and epiglottis, with "moth-eaten" ulceration (diagrammatic).

FIG. 12.

Tuberculosis of larynx; growth sprouting from anterior two-thirds of right ventricle (diagrammatic).

scope the blue tint of the oil around and in the larynx and, above all, well below the vocal cords. This is, therefore, a method of applying local antiseptics to the sub-cordal region.

Case of Hoarseness from Fixation of Vocal Cord.—B., a middle-aged lady, complains of hoarseness and weakness of voice. The laryngoscope shows immobility of the left vocal cord half way between the positions of phonation and inspiration. For this we have been unable to find any cause either in the chest or the nervous system. The X rays show no aneurysm or other growth; there is no difficulty in swallowing, and the Wassermann reaction is negative. It may be that the left recurrent laryngeal nerve is involved in an old tubercular adenitis in the mediastinum.

For those who wish to practise *intralaryngeal manipulation* in the way of painting, anæsthetisation, galvano-cauterisation, and excision of portions for biopsy or other reasons, I most strongly recommend the use of the left hand for the mirror as an invariable routine so that it may be relied upon for illumination and inspection while the right hand is free for instrumentation. Those, again, who may be called upon to demonstrate the laryngeal condition to students or others would do well to remember that the observer should look over the shoulder of the demonstrator opposite to the hand in which the mirror is held and that the demonstrator should tilt the mirror in such a way that he himself can centre the Wrisberg cartilage on the side of the observer. The observer then gets a good view of the glottis and larynx in general.

It is hoped to publish each month the list of discussions to be held at the Post-Graduate Hostel, Imperial Hotel, Russell-square, W.C. These take place at 9 P.M., and all members of the medical profession are assured of a warm welcome.

FIG. 10.

Leduc's laryngeal powder inhaler.

as to render him almost unfit for his occupation and to cause considerable anxiety as to his safety. In his larynx there is a small round swelling of the mucous membrane in the right half of the inter-arytenoid space, the vocal cords present a "raw beef" aspect and on them, as well as below them, there are adherent masses of greenish inspissated muco-pus. This will recall to your mind the diagram I showed you of rhinitic laryngitis—namely, laryngitis secondary to nasal suppuration. I attributed the trouble to this cause, and since washing out his nose several times a day the laryngeal condition has enormously improved and the voice in proportion.