result will show whether this will give to us the solution of the cirrhosis problem.

I am the more inclined to be cautious, in that the conclusions reached in the appendix to my Edinburgh paper, although stated to be provisional, may naturally have raised expectations as to the specific nature of ordinary cirrhosis which this further contribution to the study must overthrow. It is so novel and unexpected a discovery that in the tissues the colon bacillus may be represented by a minute diplococcus-like body that I cannot but feel that for the statements contained in my Edinburgh paper no apology is needed.³ The recognition of this diplococcus-like modification in itself modifies and expands the subject to such an extent as to open up a very wide field. For the present I shall be amply satisfied if I have adduced evidence favouring the view that after all what—in the absence of adequate classification—I prefer to call “progressive hepatic cirrhosis,” is but one of the results of the entry of the colon bacillus and its products into the system.

The specimen utilised for my *camera lucida* drawings appeared so definite that I forwarded it to Edinburgh, there to be demonstrated. Later specimens stained for flagella by the same method show most clearly the lateral arrangement and abundant flagella. Either the earlier attenuated forms were provided with few flagella, and those close to the ends, or the early preparations were defective. I am ignorant of any observations supporting the former view, and must therefore accept the latter as the probable explanation. It is, however, interesting to note that the earlier observers upon the colon bacillus made a like mistake and accorded to it terminal flagella.

In conclusion, let me state again that I do not for a moment assume that all extensive fibrosis or cirrhosis of the liver belongs to the same category. I fully admit that syphilis, tuberculosis, typhoid, and perchance some of the exanthemata, may be followed by extensive laying down of new connective tissue in the liver. But in none of these conditions, with the possible exception of syphilis, does the cirrhotic change assume the peculiarly progressive and extensive type even in the hobnailed liver and the varieties of the same. And, as to Hanot's cirrhosis, never having studied a case possessing the classical symptomatology of this disease I cannot make any statement.

REFERENCES AND NOTE.

¹ Procedures recommended for the Study of Bacteria, *Journal of Amer. Public Health Association*, 1898, p. 75; reprint, p. 38. ² *La Presse Médicale*, April 21st, 1897. ³ Of my previous observations, but one, I believe, has not been confirmed in my further studies. I refer to the observation that in the microbes isolated from a case of cirrhosis the flagella were terminal. In the earlier specimens, made by the Nicolle-Morax modification of Loeffler's method, I looked most carefully for lateral flagella and found none.

TWO CASES OF MALIGNANT DISEASE OF THE VOCAL CORDS: THYROCHONDROTOMY: NON-RECURRENCE IN ONE CASE

AFTER TWO YEARS.

By HERBERT TILLEY, M.D., B.S.LOND., F.R.C.S.ENG.,
Surgeon, Throat Hospital, Golden Square.

THERE are few more interesting pages in the literature of laryngology than those which deal with the history of the operative treatment of malignant disease of the larynx. Formerly, surgical interference in these cases was a serious undertaking and very liable to be followed by septic pneumonia—a risk which was felt to be so great that patients were often left to the ravages of the disease until tracheotomy became imperative to obviate asphyxia, whilst at the same time it conferred the doubtful benefit of prolonging for a short while a life of pain and abject misery.

To-day there is probably no operation undertaken for the relief of malignant disease in any part of the body which can show better results than that of thyrochondrotomy or laryngofissure for early cases of epithelioma of the vocal cords or the structures in their immediate vicinity. It is to this form of malignant disease that these remarks apply.

By careful attention to operative detail and technique,

accompanied, of course, by strict asepsis, the dreaded complication of septic pneumonia can be almost certainly avoided, and it is astounding when the importance of the structures interfered with is remembered, how rapidly patients attain convalescence, and for what a length of time they enjoy freedom from recurrence in those cases where the disease has been attacked early in its history and whilst limited in extent.

It need scarcely be said that cases of malignant disease of the larynx are not common, and when they do occur their presence is often manifested by such trivial symptoms that little notice is taken of them (*vide infra*). Consequently, they too often drift on until it is too late to undertake any radical treatment with even a fair prospect of success.

It may be hoped, therefore, that the publication of the notes of these two cases may assist in bringing forward again the salient features of the symptoms, early diagnosis, and treatment of this form of malignant disease.

Mr. J. S., aged 65, a fine, healthy-looking man, consulted me on September 2nd, 1896, for “hoarseness” of 12 to 14 months' duration.

History.—He complained of no pain or difficulty on swallowing, and no perceptible loss of flesh, simply and solely “hoarseness.” So impressed was he with the triviality of his condition that he expressed himself as “ashamed to consult anyone for such a small matter,” and it was only to appease the anxieties of his friends that he presented himself. He had been treated with gargles, pastilles, etc., but without any relief to his symptoms, and no laryngoscopic examination had been made. On examining the larynx I found the right vocal cord thickened, ulcerated, and congested, the upper edge of the ulcer being thickened. The cord was immobile on phonation. There were no enlarged glands in the neck. The left vocal cord and both vocal processes were normal. These appearances led me to diagnose epithelioma of the right vocal cord, an opinion which was confirmed by Sir Felix Semon, who afterwards saw the case with me.

Operation.—We persuaded the patient to adopt the only course which offered him any hope of permanent relief, and on September 15th, with the able assistance of Mr. Ewen Stabb, I performed the following operation, which embodies most of the suggestions which had previously been made and practised by Hahn, Butlin, Semon, and others. The patient being anaesthetised (chloroform) I made a vertical incision in the median line of the neck, from a finger's breadth above the thyroid notch to the upper end of the sternum. The trachea was exposed, and in order to do as low a tracheotomy as possible I divided the thyroid isthmus. Hooking up the trachea the lower of the rings exposed in the wound were divided and a Hahn's aseptic sponge cannula inserted and a smaller marine sponge on the top of this. The former was left for ten minutes to expand and occlude the trachea, and meanwhile the thyroid cartilage was divided in the midline by means of a nasal saw, the latter or some similar instrument being necessary, as the calcification of the cartilage rendered it too resisting even for a strong pair of scissors. The upper three rings of the trachea were also divided, thus leaving two complete rings between the lower end of the upper and the upper end of the lower tracheal incision. My object in leaving these intervening rings entire was to give the tissues in the middle line more support, and also to make it easier to find the trachea in case a future operation became necessary on account of recurrence. On drawing asunder the halves of the thyroid cartilage the diseased cord was seen, and, as one generally expects in these cases, the affected area was greater than that revealed by the laryngoscope. A dossil of wool soaked in 10 per cent. cocaine solution was applied to the diseased area in order to render it as anæmic as possible. A captive marine sponge was now passed up into the pharynx through the wound in order to prevent any mucus coming down on the larynx during the operation, and ten minutes or so having elapsed since the cannula was inserted, I seized the diseased cord in a small pair of vulsellum forceps, and with a scalpel made a semilunar incision into the healthy tissues surrounding the growth, including the right vocal process; and, as the disease approached very closely to the right arytenoid cartilage, I included that as well. The parts were detached mainly by a periosteal elevator and partly with a pair of blunt-pointed scissors. The former answered its purpose very well, for the inside of the right cartilage was perfectly denuded of its coverings, and resembled in appearance a pearl button. The hemorrhage was very slight, and only one vessel in the posterior part of the wound had to be controlled with forceps. The interior of the larynx was now painted with Whitehead's varnish (benzoin 4 parts, storax 3 parts, balsam of tolu 1 part, ether pur. 40 parts, iodoform 4 parts), an excellent styptic and antiseptic, dusted with iodoform, the pharyngeal sponge removed through the mouth with a quantity of mucus, and the halves of the thyroid cartilage drawn together and kept in apposition by a fine silk suture, which did not enter the lumen of the larynx; a similar stitch was inserted into the upper rings of the trachea, the cannula removed, and the whole wound thoroughly cleansed with 1 in 2,000 perchloride of mercury solution, and stitched up with the exception of a small portion of its lower end, through which for four hours I inserted a small rubber tube into the trachea, thinking it might expedite the expectoration of blood-tinged mucus from the lungs which he coughed up, more especially whilst recovering from the anæsthetic.

After-History.—Warm sponges were kept constantly applied to the lower end of the wound during the next eighteen hours, and the patient kept on his right side. A light cyanide gauze dressing was placed next the wound. The temperature varied for the next four days from 99° to 100°, after which it was normal. On the evening following the operation he had a nutrient enema.

September 16th. The patient complained bitterly of thirst, so he was allowed a sip of water, which he swallowed without difficulty; he then drank half a tumbler of egg and milk mixture. On September 17th he ate bread and butter and easily swallowed fluid and on September 19th milk pudding, boiled sole, and mashed potato.

During the day or two following the operation there was a quantity of blood-tinged expectoration which gradually became less. The wound healed by first intention (except its lower end where the tube was inserted), and seventeen days after the operation he wrote to me from Bournemouth to say that his appetite was returning fast, and that he was nearly feeling himself again.

I have seen him on three or four occasions since, and notice a small papillomatous-like mass in the anterior commissure about the size of a pea, which was present six weeks after the operation, and is still present (August, 1893) and not increased in size. The larynx is still free from recurrence, the patient is 17 lbs. heavier than before the operation, and is in all respects well and apparently cured.

Microscopical Examination.—The growth showed it to be a typical squamous epithelioma of the vocal cord. As regards the quality of the voice in this patient after the operation, it is best described as "gruff."

CASE II. W. C., aged 49, applied to my clinic at the London Throat Hospital, Great Portland Street, February 13th, 1893.

History.—He complained only of "hoarseness" of two months' duration. Laryngoscopic examination revealed a whitish-grey nodular thickening occupying the anterior fourth of the left vocal cord. At its junction with the cord posteriorly the latter was distinctly congested, in marked contrast to the colour of the corresponding part of the right vocal cord. On inserting the finger into the larynx the growth was felt to be distinctly hard and immobile. On phonation the cord was almost completely immobile. The microscopical examination of a small portion of the growth, which I removed by intralaryngeal forceps, also suggested its epitheliomatous nature. The diagnosis of malignant disease was therefore made and confirmed by many members of the London Laryngological Society who saw the patient next day.

Operation.—It is unnecessary to describe in detail the operation which I performed on the 21st inst., in all essential details it was the same as that described in Case I. I did not, however, remove the arytenoid cartilage in this case as the disease was not so extensive as in Case I. The anterior end of the right vocal cord was whitish in colour, due possibly to attrition of phonation by the growth on the opposite cord. I therefore removed a small portion of it, but the microscope revealed no diseased condition. As in Case I I took away a considerable portion of the left vocal process in order to get as wide of the growth as possible, and having checked the slight hæmorrhage, the two halves of the thyroid cartilage were brought into apposition by means of a fine silk stitch, and the whole wound sewn up except just at the lower end.

After-History.—Next day the patient drank fluids without any trouble, and made a rapid recovery, leaving the hospital on March 3rd, that is, about eleven days after the operation. I think it only fair to say that his rapid convalescence was largely due to the painstaking care and attention of the hospital matron, Miss Robinson. I have seen him quite recently, and excepting for a small granuloma in the anterior commissure, which has been there since the operation (similar appearance in Case I) the larynx looks like a normal one, for a sort of false cord has formed in place of the one removed, and the man has an excellent voice.

The diseased structure was examined microscopically by the pathologist to the hospital, Mr. E. B. Waggett (who kindly assisted me at the operation); he reported it to be a typical squamous epithelioma. Sections were also exhibited at a meeting of the Laryngological Society.

The one lesson of vital importance which such cases teach us is that a middle-aged man, even in apparently perfect health but suffering from "hoarseness" of more than temporary duration, or even marked alteration of the voice, should not be allowed to rest until his larynx has been carefully examined by some one skilled in the use of the laryngoscope. It will be noticed that in both my cases "hoarseness" was the one and only symptom which led the patient to seek advice, and Case I practically apologised for troubling me about such a simple matter. It is by the general practitioner that this point should be borne in mind, for as a rule it is he who is first consulted in the matter, and if he prescribes gargles, pastilles, etc., waiting to make his diagnosis from pain "shooting from the throat to the ear," pain or difficulty of swallowing, etc.—symptoms which only as a rule occur late in the disease—he will probably rob his patient of his only chance of cure. I use the term "cure" because I think that a study of statistics¹ of early cases operated upon entitle us to use the word in its full meaning.

An interesting and very important feature in the history of Case I is that the hoarseness, and therefore we may take it the disease, had existed for twelve to fourteen months before I saw him, and yet there were no secondarily infected glands in the neck or elsewhere, and the after-history seems to show that the disease was strictly confined to the larynx. This tendency to remain localised for a considerable length of time seems to be a peculiar characteristic of epithelioma of the larynx, and has been explained as due to the fact that the lymphatics of the larynx have not that free anastomosis with those of surrounding structures which is found in other organs. Such a fact, whatever may be its explanation, is of great importance, for it teaches us that, provided the disease is fairly localised, operative interference may be undertaken with good prospects of prolonged, if not permanent, relief, even though the disease has been present for such a length of time that secondary deposits might reasonably

(judging from epithelioma in other regions) be supposed to have occurred. Furthermore, we are warranted in holding out good hopes of permanent relief to patients whose decision to undergo operation depends on the answer we can honestly give to the question "What hope is there of a real cure?"

It will be noted that in each of these cases laryngoscopic examination revealed a localised thickening of the cord, with impaired mobility on phonation. Such appearances are very strongly suggestive of malignant disease, but are not quite so pathognomonic as is often supposed. It is only a short while since I showed a case at the London Laryngological Society of a man complaining of hoarseness, with a thickened and immobile cord; the almost unanimous opinion was that it was a case of epithelioma of the vocal cord. However, I shortly had an opportunity of making a *post-mortem* examination (the patient died of tuberculous meningitis), and found tuberculous infiltration of the affected region with extension into the crico-arytenoid joint, thus accounting for its immobility. Since then I have seen two other cases in which, had not the lungs been affected with tubercle, I think it would have been impossible to say from the mere laryngoscopic appearances whether the disease was tuberculous or malignant. In Case II the milky whiteness of the growth was very suggestive of its malignant nature.

In such cases it is always wise to remove a small portion of the growth with endolaryngeal forceps, and subject it to the microscope for any additional light which may be thrown upon it. Much information, too, can also be obtained (as has been insisted on by my colleague, Dr. J. W. Bond) by passing the index finger quickly into the larynx and noting the presence or absence of that hardness and fixity of tissue so characteristic of epithelioma. It is not, however, always possible to reach the larynx in this way; but the writer can fully endorse the value of the method where it is practicable.

The appearance of a small granuloma-like mass within a few weeks of the operation does not necessarily mean recurrence of the disease; but unless their tendency to appear is borne in mind they may (as in Case I) cause the surgeon some anxiety. In that patient I had reason to think that possibly the small granulation was produced by the irritation of a stitch, part of which appeared in the larynx, but the appearance now is exactly the same as a few weeks after the operation, and so another explanation, possibly the puckering or undue prominence of the edges of the intralaryngeal wound, may produce the condition.

In both cases the external wound has been sewn up (excepting at just its lower end) at the end of the operation. I do not think this has usually been done by other operators, but it seems to me to be very advantageous; the scar left is almost unnoticeable, and with due attention to cleanliness septic troubles may usually be averted. If, however, the latter should arise, the wound can be at once opened, and the risk of septic inflammation spreading into the connective tissue planes of the neck avoided.

In Case I no difficulty in swallowing arose from removal of the arytenoid cartilage and the contiguous mucous membrane.

In Case II the excellence of the voice six months after operation is somewhat remarkable considering the whole vocal cord and a large portion of its corresponding vocal process was removed.

Even more surprising is the appearance of the larynx as seen in the laryngoscope, for a kind of pseudo-cord of cicatricial tissue has taken the place of the diseased one, and by the approximation of the normal cord to this an almost perfect glottis is produced. I think I may go so far as to say that if an expert laryngologist examined the patient's larynx without knowing anything of the history of the case, the only abnormality he would notice would be some impairment of mobility in the left pseudo-cord.

In adding this small contribution to the records of surgical interference for malignant disease of the larynx, I trust it may illustrate the importance of not neglecting to examine carefully the condition of a patient's larynx when symptoms of disease are present, even though they may be *apparently* of a trivial nature.

REFERENCE.

¹ Semon, *Lancet*, 1894, pp. 1476, 1477; Butlin (paper by De Santi), *BRITISH MEDICAL JOURNAL*, 1895, pp. 1025-1028.