Remarks

ON

A SERIES OF CASES OF EXTERNAL OPERATIONS ON THE LARYNX.*

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THE operation of thyrotomy is one of considerable antiquity, though we question whether its full scope and utility have been recognized until within the last few years. The late Mr. Durham stated that Ehrmann in 1844 first performed this operation for laryngeal growths, which he diagnosed, of course, without the aid of the laryngoscope.¹ Since then a number of operations upon the air passages by external incisions have been performed, particularly in Germany, and Hahn especially greatly improved the technique of the operation of thyrotomy, introducing the well-known inflatable tracheal tube which bears his name.

THE OPERATION.

The following series of cases seem of sufficient interest to warrant their publication, as they illustrate the scope and excellent results which are to be obtained by thyrotomy and other external operations upon the air passages. As a preliminary I would describe the method of operation, which differs, in some small particulars, from that usually adopted. In the first place, the services of a highly-skilled anaesthetist are essential, and no surgeon should attempt one of these cases without such aid. Chloroform is, I think, the best agent to employ. A good light is needful, and in dark weather the aid of a forehead electric lamp is often highly advantageous.

When I first commenced to perform these operations I followed the usual rule, and made two incisions; one for the preliminary tracheotomy, the other for the division of the thyroid cartilage. The somewhat limited area thus exposed rendered the checking of all haemorrhage very tedious, and thus materially increased the difficulty and length of the operative procedures. I now strongly advise that the larynx and trachea should be exposed by one longitudinal incision from above the thyroid cartilage to a point $1\frac{1}{2}$ in. below the cricoid. This incision is deepened until the cartilages are reached, and on retraction of the edges of the wound the whole field of operation is laid bare in a remarkably advantageous manner. The haemorrhage is always profuse, but in this large wound the veins are caught with pressure forceps, and tied or clamped with ease and alacrity. Indeed, the checking of haemorrhage by this method effects an agreeable contrast to the small incision, where the perpetual "welling up" of venous blood is a serious inconvenience to the operator. At the lower extremity of the wound the thyroid isthmus is seen, and this may be drawn downwards, so as to uncover an additional ring of the trachea; if large it may be divided between two clamp forceps. During all these proceedings the patient's head is well thrown back and steadied by an assistant.

The second stage of the operation—that of opening the trachea—has now arrived. This is done easily and deliberately below the cricoid cartilage, and the tube is inserted. Personally I prefer the tube covered with compressed sponge. This I powder with iodoform before introduction. I usually allow 8 minutes to elapse for the sponge to swell and the anaesthetist to adapt himself to the new conditions of administration. The methods of administering the chloroform vary with different authorities. Personally, I prefer the administrator to blow the vapour into the tube by means of a small bent cannula. This allows any blood or mucus to be instantly cleaned out of the tube by means of feathers or a brush. It may here, too, be pointed out that the tube, whether covered with compressed sponge or surrounded by the usual inflating rubber bag, should be tested by the surgeon with scrupulous care, to ascertain for himself that the accessory materials are properly secured. When the sponge, for example, swells in the trachea, some difficulty is experienced at the end of the operation in withdrawing the tube from the tracheal wound, and if badly constructed, the

sponge may easily become detached—an awkward and alarming accident. All brushes should in like manner be well made, so that any possibility of their heads "coming off" is out of the question. The tube being secured by tapes, if the thyroid cartilage be calcified, as is common in adults, it may be divided by a fine saw—a very fine saw²—or by strong scissors curved on the edge. If possible, the extreme upper border of the cartilage should be left intact, so as not to interfere with the petiolus of the epiglottis. The assistant now grasps each cut margin with artery forceps and thoroughly everts and retracts them. Some surgeons prefer sharp hooks for this purpose. The growth or foreign body at once comes into view, in a remarkably clear manner. If a growth, the novice will be surprised to find that it is always more extensive than he was led to anticipate from laryngeal examina-

Fig. 1.—The long incision for thyrotomy; the dotted lines show the position of section of the cartilage; the tracheotomy tube is in position. (After Moure).

tion. The decision is now arrived at as to the extent of the operation to be performed. Whether the growth is alone to be removed, the tissues at its base, or the lateral ala of the thyroid cartilage itself. The operation is usually done for what may be termed potential epitheliomata, warty growth with cellular infiltration at the base in adults, or for actual epithelioma of one or other of the cords. The tissues from which the growth springs are generally freely removed. It is now my practice to paint the growth with a 20 per cent. solution of cocaine, to which is added 10 gr. of suprarenal extract dissolved in half a drachm of cold water. The extract must be freshly made. The diminution of troublesome local oozing by this means is highly advantageous and striking. A small and carefully purified Turkey sponge is pressed into the trachea at the lower angle of the laryngeal wound. It should have a piece of silk attached. This is an additional preventative against blood passing down the air passages; I regard it as an invaluable aid, and shall relate a case where I relied upon it alone, an ordinary tube being inserted below. The growth is now grasped with "mouse-tooth" forceps, and

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freely cut away. I do not hesitate to sacrifice all the soft parts down to the cartilage beneath. Pressure is made on the wound inside the larynx with minute sponges held on forceps, and wrung out in spirits of turpentine. I next apply a fine and sharp curette, and finally the galvano-cautery at a cherry-red heat, sparing no pains to render extirpation as free and as extensive as possible. The application of the cautery finally checks all oozing. A little finely-powdered iodoform is dusted upon the part, and the thyroid cartilage is united with strips of kangaroo tendon. Here the use of a fine drill must be employed if the cartilages be markedly calcified.

The incision is accurately united with fishing gut and horse-hair right down to the tracheotomy tube, and here a point of great importance has to be considered, the question of withdrawal or retention of the latter. As a rule, I now remove the tube so soon as ever the patient has recovered his "coughing reflex" and partial sensibility. Any blood which may then enter the air passages is readily expelled by coughing. The lower part of the wound, after the withdrawal of the tube, is not closed, but covered with a pad of iodoform gauze and kept carefully cleansed. The diagram (page 941) shows the extent of the incision, the position of the suture in the thyroid cartilage, and the tracheal tube in position.

TREATMENT AFTER OPERATION.

The dressing of the neck is very simple, and mainly consists of collodion to the upper part of the wound and iodoform to the tracheal opening. About the fourth day the margins of the latter are approximated by adhesive strapping. The patient keeps the sitting posture in a "steam tent," and occasionally inhales the vapour of creosote. Three times a day a spray of "Listerine" mixed with equal parts of tepid water is used for the larynx. No use of the voice is to be permitted. The patient must be provided with a slate to write his wishes and replies. I have found that patients swallow with surprising ease after this operation. I usually employ rectal alimentation for two days. I then commence to administer meat lozenges, which are gradually sucked. Thirst is relieved by small lumps of ice. At first swallowing is best performed by the patient lying upon his side, the tube of the feeder being placed in the dependent cheek. Should any slight fetor be noticed in the breath, and this is not normal on the third or fourth day, I add a little carbolic acid to the "Listerine" spray. In about fourteen to twenty days convalescence is established; indeed, the recovery is very easy and quick. I never allow the voice to be used for a full month, and then only in a quiet whisper. The recovery of the vocal functions is ultimately quite surprising though the intonation is always hoarse. The following cases may now be related:

CASE I. Fracture of the Larynx, Dyspnoea, Tracheotomy, Obstruction of the Glottis by Cicatricial Tissue, Thyrotomy and Removal, Complete Recovery.—This case has already been reported very fully in the *Lancet* for November 14th, 1896, but to make the series complete I reproduce its main features. A woman, aged 23, sustained a severe fracture of the larynx, which was asserted to have been caused by her walking in her sleep and falling over a chair. I always looked upon this statement with suspicion, and a belief that the injury was sustained from personal violence. She was admitted into St. George's Hospital on July 10th suffering from dangerous dyspnoea, and the house-surgeon, Dr. Fison (now of Salisbury), performed tracheotomy, and thus saved her life. She was discharged to all appearances well, on July 29th, the tube having been removed on July 20th. She had complete aphasia, but breathed well. On July 31st, however, an attack of dyspnoea came on. She returned to the hospital, where the wound was opened, and the tube again inserted. The case was watched through August, and the larynx gradually became stenosed. The cords were thickened, and beneath them some cicatricial formation could be plainly seen. In September thyrotomy was performed, and the larynx below the cords was nearly closed by a cicatricial web, which was continuous with a collar of indurated tissue and the cartilage externally. This was obviously due to chronic inflammatory action about the fracture. No projecting part of cartilage could be felt. The tissue was cut away with scalpel and forceps and the larynx strongly stretched open with the finger. The operation was done in the usual way

and there was nothing to note about the after-treatment. By August 23rd all the parts were healed and she was walking about the ward. She made a good recovery and was seen two months after. She breathed well and her intonation was a little hoarse, but surprisingly good, considering the extensive operation done. The cords remained greatly thickened.

CASE II. Syphilitic Stenosis: Ultimate Result Unfavourable.—A man, aged between 30 and 40, was admitted into St. George's Hospital in May, 1897, and had tracheotomy performed on account of sudden and urgent dyspnoea. He was suffering from manifestations of tertiary syphilis, and was placed upon full doses of iodides. The appearances with the laryngoscope were as follows: Great swelling all round the aperture of the larynx; anteriorly a glimpse could be obtained of a growth smooth on the surface, which seemed to originate very far down below the cords. Both cords moved imperfectly and remained widely abducted, as though nerve lesion were present. After taking iodides for several months the swelling greatly reduced, and the formation could then clearly be seen; it was smaller than before, and uncertainty still existed as to its distinct nature. The cords were still widely abducted and motionless. On stopping the tracheotomy wound urgent dyspnoea was at once produced. Doubt occurred in this case as to whether the dyspnoea, especially marked during inspiration, was due to abductor paralysis or to the presence of a neoplasm, and accordingly it was decided to perform thyrotomy. This was done in June, 1897. There was a special difficulty about the operation, owing to calcification of the thyroid cartilage, which had to be divided with fine cutting forceps. On opening the larynx, no distinct growth was found; there was a swelling below the cords, consisting almost entirely of inflammatory thickening, covered with a prominent and rugous fold of mucous membrane. This was cut away with curved scissors. Recovery from the operation was uneventful, but no benefit was obtained, and the patient was discharged still wearing the tube. The wound at the site of operation persistently contracted, with the formation of much scar tissue. Under cocaine the larynx was thrice dilated, and once under anaesthetics the parts were stretched with the finger. The patient became intolerant of further proceedings, and preferred to wear his tube. When relating a series of cases of any operation, it is, perhaps, as important to relate the failures as the successes, and I should not be disposed to repeat this operation for syphilitic stenosis unless a very distinct neoplasm or "web" of tissue could be removed.

We next come upon a series of 4 cases where this operation was performed for growths of the larynx, with results only to be described as excellent.

CASE III. Recurrent Papilloma: Thyrotomy and Excision of Growth: No Recurrence.—I wish to relate this case very shortly, lest the identity of the patient be discovered. A cleric, aged 54, began to suffer in 1893 from dyspnoea and hoarse intonation. A growth was discovered on the left cord, and a portion of this was removed with forceps, and was stated to be papillomatous. It was then removed in three separate sittings by a skilled laryngoscopist, and after some applications of a caustic nature a cure was reported. The patient stated that he recovered his voice and breathing well. In three months fresh symptoms arose, and he went abroad, when, so far as could be made out, similar operations were performed again with benefit. I saw him towards the end of 1893. He then had a growth on the left cord, which looked the size of a pea, and was of a pink colour. The larynx was swollen and inflamed, and a complete view of the growth difficult to obtain. He was hoarse and had some slight inspiratory dyspnoea; he was a stout "full-blooded" man. No induration or glands could be felt in the neck. I treated him with leeches and iodides for a fortnight, and then performed thyrotomy. The growth on exposure was, as usual, more extensive than could be estimated from above. It was the size of a cherry, sessile, and implicating both the cord and the side of the larynx. I cut it away freely, curetted the side of the larynx, and applied the galvano-cautery. The bleeding was very free, and I employed the manoeuvre before spoken of—namely, plugging the trachea below the growth and above the tube with a small Turkey sponge. The only special remark I have to make about this case was the freedom of

extirpation. The whole of the soft parts on the left side of the larynx were removed. Parts of the growth were sent to three good observers. One stated it was epitheliomatous, another papillomatous, and a third called it a degenerative papilloma, potentially cancerous. The fact was that the growth was inflamed, and its true characters difficult to determine. I informed the patient that the prognosis of his case was dubious. He made a rapid recovery, and the only after-anxiety was some bronchitis with fetor of the breath on the fourth day. He recovered his voice sufficiently to articulate hoarsely, but never to do his duty. He remained perfectly well for four years. I saw and examined him at intervals. He died in 1898 from "influenza and pneumonia," but there had not been any return of laryngeal disease. I purposely omit the names of the medical men who were concerned in this case, but I may state that the highest skill was brought to bear on the previous laryngeal efforts, and they were probably performed as well as it is possible to execute such operative proceedings by the way of the natural passages.

CASE IV.—Fibroma: Thyrotomy: Removal by Galvano-Cautery: Recovery of Voice.—A single woman, aged 33, came to St. George's Hospital in March, 1897. She had had good health until three years previously, when she gradually began to suffer from dyspnoea and loss of voice. The aphasia got worse and worse, so that she could only use her voice a little in the summer. She had occasional severe attacks of coughing with dyspnoea, which lately had been increasing, and had alarmed her.

On examination of the larynx, a pale, lobulated, rather sessile growth, the size of a large pea, could be seen to the right side and a little below the cords. It seemed to spring from the left cord, and narrowed the aperture of the larynx to a mere "chink." Dr. Whipham saw this case with me in consultation, and agreed as to the desirability of thyrotomy. The operation was performed on March 23rd. Dr. Dickson administered chloroform, and a preliminary tracheotomy was done. There was much venous oozing, and an enlarged layer of thyroid tissue lay in front of the trachea, which made the operation very difficult. A Trendelenberg's tube was inserted. The thyroid cartilage was split in the middle line, and pulled apart with sharp hooks. There was at this stage troublesome and profuse venous oozing, checked by pressure with a turpentine sponge. The growth, about the size of a large pea, now came into sight; it grew from the left cord. On being seized with the cold wire snare, its base was very tough and resistant, and it was found impossible to pull it away. Accordingly its base was slowly severed with the galvano-cautery. A tracheotomy tube was left in for a week, the parts being often sprayed with hydrogen peroxide solution. The tube was removed finally on April 1st, when the parts above were soundly healed. The final result of this case was excellent. In August, 1897, the patient had entirely regained her power of speech, which she had lost for six years. This was the more remarkable as great puckering and deformity occurred. The pathologists pronounced the tumour to be a fibroma and innocent in nature. It was thickly covered with a stratified epithelium.

The principal difficulties in this case were the profuse bleeding, which much obscured the parts. The Trendelenberg's tube acted well, no blood getting down into the bronchi. There can be no question that the bulk of this tumour could have been removed *per vias naturales*. There can equally be no question that its base could not be so dealt with. It was peculiarly broad and to a large extent incorporated with the right vocal cord.

CASE V.—Removal of Large Papillomatous Growth from the Larynx, together with the "Cord" and all the Soft Parts.—The patient was a Catholic ecclesiastic, aged 45. He came under my care in the summer of 1898. Hoarseness had gradually supervened for three years, and lately had progressed to almost complete aphonia. These symptoms had been much worse lately, and, in addition, "suffocation spasms" had recently been experienced. The case was under the care and inspection of Mr. Edward Blackett. The patient was a pale, ascetic-looking man. His voice was harsh and raucous, sometimes disappearing entirely. The left side of the larynx was occupied by a growth the size of a peach stone, which was lobulated, livid in colour, and seemed

to have a broad base. There was no glandular enlargement in the neck. Under cocaine the mobility of the growth was freely examined with a curved probe, and it was found to be very sessile. Dr. Whipham also examined the case on several occasions, and the question of attempted extirpation *per vias naturales* was much discussed. Finally, thyrotomy was determined upon, and was performed on August 10th, 1898. There was nothing very special about the operation excepting that the growth was very extensive; and I was uncertain as to whether the half of the larynx also should not be removed *in toto*. The bleeding was also profuse and troublesome. He made a good recovery without complications. Dr. Lazarus-Barlow kindly examined the growth, and found it to be of the usual nature—a warty papilloma, with abundant cell proliferation, but not truly epitheliomatous. For many months this gentleman's voice remained only a whisper, but his phonation gradually improved, and I have had a chance of examining him two years and four months after the operation. His voice is so surprisingly good that it is difficult to make observers believe he has had an operation done, and this is again borne out by the extraordinary changes in the larynx itself. The right cord is so mobile as to come over to the left side of the middle line, and here exists a ridge of mucous membrane or scar tissue, which looks at first sight exactly like a vocal cord. There is no sign of return of the tumour, but the aperture of the larynx is a little oblique or deformed. The result of this case has made a great impression on my mind as to the beneficial effects of this operation.³

CASE VI.—Sessile Papilloma removed by Thyrotomy: Recovery with Improved Voice.—The next case is equally satisfactory, though at the time of writing this paper only nine months have elapsed since the operation, so that one can hardly pronounce the certainty of a permanent cure, yet I believe such a result is exceedingly probable.⁴ A gentleman, aged about 40, strong, plethoric, "thick set," and given to field sports, saw me in February, 1900. He had used his voice a great deal in hunting, and had noticed hoarseness and dyspnoea gradually creeping on for about three months. An examination was made with great difficulty. He was unable to open his mouth to the full extent, and any introduction of the mirror caused violent spasm and retching. The tongue could not be protruded. Feeling sure that some serious laryngeal trouble existed much patience was exercised, and the patient practised opening his mouth and breathing. Ice was applied to the pharynx, and a 5 per cent. cocaine spray. At length with a small mirror I distinctly saw a growth. It was only a momentary glimpse, and, beyond the fact that it was on the left side, I was unable to study its characteristics. I therefore administered iodides in full doses, and repeated examinations of the throat were made. By the middle of March I was able to see the growth mass distinctly, and it had obviously not diminished in size. Moreover the patient had had one severe attack of dyspnoea, which caused him to start up in bed with a sense of suffocation.

I afterwards learnt that during this time the patient had taken other opinions both in London and the provinces. I need not enlarge on the treatments advised as they were quite inapplicable to the case. I felt certain that personally I was quite unable to remove this growth by the natural passages, for even after weeks of patience and practice it could only be seen with great difficulty. By my request Mr. Butlin saw the patient with me in March. He recognized the difficulty of good inspection of the growth, but concurred with me in advising thyrotomy. The operation was done in the usual way and no difficulty was experienced. As the neck was short, thick, and plethoric, I made the superficial incision unusually free, from the hyoid bone to the sternum, and the fierce venous bleeding, easily checked, showed how materially a too small opening would have delayed the future steps of the operation. After opening the larynx, I passed a small Turkey sponge on a piece of silk down the trachea for about an inch, and saturated the growth with a strong solution of cocaine and suprarenal extract. I was surprised at its size. I had estimated it at that of a pea. It was quite as large as a cherry, and very sessile. After extirpation the cautery and curette were vigorously applied, and on withdrawing the little sponge a small clot was brought up on its superior surface. The

Hahn's tube was removed so soon as "coughing reflex" was restored, and the patient was convalescent in fourteen days. The wound healed at once. He had no bad symptoms. Microscopically the growth was a papilloma, but there was much cellular infiltration at its base, and one observer was confident it was cancerous. Recovery of voice in this case confined to a loud whisper, but the patient is in the best of health.⁴

CASE VII. Thyrotomy for Foreign Body (Bone).—On December 28th, 1899, I was called to see a young man suffering from dyspnoea. His face was dusky and covered with sweat; his respirations distinctly laboured, with evident inspiratory stridor, and his voice reduced to a hoarse whisper. He stated that four days ago he had accidentally "swallowed" a large piece of bone, that it "stuck in his neck," and he brought up some bright blood. The difficulty of breathing and the pain in swallowing had apparently only been severe enough to frighten him in the last twenty-four hours. His condition was one of distress and danger.

Laryngoscopic examination was attended with the greatest difficulty. The parts were much swollen, having indeed an erysipelatous appearance. In the narrow "chink" between the swollen thyro-arytenoid folds a distinct glimpse was obtained of a piece of bone; it appeared like a spicule of osseous substance, stretched across the larynx antero-posteriorly. The difficulty of seeing it, and the spasmodic and dangerous dyspnoea of the patient, made, in my judgment, any attempt at removal from the mouth very unwise. Seeing the perilous and urgent nature of the case, I at once made arrangements for operation. Chloroform was carefully administered by Dr. Blumfeld. I exposed the whole front of the larynx and trachea to the root of the neck by a free median incision, which was rapidly deepened; the very free venous bleeding was readily checked by forcipressure, though so free an opening. Tracheotomy was performed and a Hahn's tube was introduced. On opening the trachea a quantity of pus was ejected from the wound, showing that the foreign body was already doing grave local mischief. The thyroid was calcified, and I had to divide it with powerful curved scissors. On opening the larynx, I could not see the bone, but by the finger it was detected lying firmly impacted below the cords, and extending downwards to the body of the cricoid. Apparently it was tilted on its edge. So firmly was the bone impacted, that it required considerable force to extract it with forceps, and this demonstrated how hopeless would have been any attempt to remove it from above. The piece of bone was of the extraordinary size and shape shown in the photograph.

Side view; actual size.

Front view; actual size.

It is hard to believe that so large a foreign body could have passed the glottis, and yet the patient survived, and was moreover able to breathe. Silk sutures were passed and not tied, and the wound was tamponaded with iodoform gauze. The operation occupied about 15 minutes, being much expedited by the free median opening.

The tube was removed in twelve hours, and the wound, covered by lymph, was drawn together by the sutures, which had been previously passed. Thymol inhalations were employed. The patient made a good recovery. His voice long remained "low and gruff" but ultimately it quite recovered, and was literally as strong as ever.

CASE VIII. Suprathyroid Pharyngotomy.—The next case is not one of thyrotomy proper but may be termed suprathyroid pharyngotomy. It affords an excellent illustration of how a growth near the superior aspect of the larynx may be reached and dealt with through an external incision.

A widow, aged 57, came to the Throat Department at St. George's Hospital in July, 1897. She had total aphasia and some dyspnoea. The aphasia had come on about eighteen months ago and had gradually become worse. She was a

stout woman, inclined to emphysema, with a short thick neck. It was only after repeated examinations with the laryngoscope that I was able to clearly distinguish and define the position of a new growth. The neoplasm apparently sprang from the anterior surface of the thyroid and extended a little way along the surface of the stalk of the epiglottis.

On July 5th, the following operation was performed under chloroform, ably administered by Dr. Menzies. A transverse incision was made in the thyrohyoid space, and another at right angles to it along the front of the thyroid cartilage. The anterior jugular veins were divided and tied, and the sterno-hyoid and thyrohyoid muscles were also divided. Here an error took place in the operation, and I found myself working above the hyoid bone instead of beneath it. This part of the operation was unexpectedly difficult owing to the profuse venous oozing and depth of the neck. At length the thyrohyoid membrane was exposed and divided, and the epiglottis, after dividing the glosso-epiglottic ligament, was drawn out of the wound by a ligature passed through it with a sharp curved needle. By this means the larynx was drawn right out of the incision and the growth readily came into view. It was more extensive than was thought, and some small irregular tuberculated masses extended along deeply into the epiglottis. It was readily removed with a snare, and the curette and galvano-cautery were deeply applied to the site of origin on the epiglottis so as utterly to destroy the tissues in immediate relation. The larynx was then replaced and the wound sutured. The growth was a papillary epithelioma. To the naked eyes it appeared epitheliomatous.

The patient was very ill after the operation, and a severe attack of pneumonia came on a week after the operation. The wound discharged at one spot, and some fluid food passed out. For the first four days she was fed by nutrient enemata, but afterwards managed to swallow by lying on the side with the head hanging over the bed. By August 17th the wound had nearly healed, and she was breathing well and commencing to recover her voice. On November 19th the patient was well and strong and had no dyspnoea. Her voice was "shaky" and uncertain, but she could well make herself understood. There was still some swelling about the arytenoid cartilages. There was no trace of return of the growth. I last saw her in 1899, two years after the operation. She was in good health and could speak well. The epiglottis was depressed, but there was no return of the growth.

I feel sure that in these cases it is an error to suture the external wound immediately. Sepsis occurs from the pharynx, and it is wiser to stuff with iodoform gauze and merely pass the sutures, not tie them, until granulations and plastic lymph appear in the wound. I believe that this method is far safer to employ in all operations upon the neck where a communication has taken place with the gullet or pharynx.

CASE IX. Case of Laryngeal Cancer: Removal of One Half the Larynx with Temporary Great Benefit.—There are many remarkable features about this case, which I shall incidentally allude to in the relation of it. A night watchman, aged 60, had suffered from sore throat and hoarseness for about three months. He was a pale, thin man, and when he came to the hospital in September, 1901, was suffering from dangerous and increasing dyspnoea. Examination was difficult, but a lobulated growth could plainly be seen filling the larynx and springing from the right side. It was ulcerating, and seemed to spread to the pharyngeal region behind. On September 7th chloroform was cautiously administered, and a low tracheotomy carefully performed. This relieved all danger of dyspnoea, and the larynx was repeatedly examined and the growth touched to estimate the possibility of removal. I may here point out, that time is well spent in these difficult cases in repeated examinations, and the operation of tracheotomy ought never to be postponed, as is so often the case, until the dyspnoea is urgent and death actually impending. On September 23rd I performed thyrotomy. I stuffed the trachea above the tube with a small Turkey sponge attached to silk, and it acted perfectly. I found the growth very extensive, and removed the whole of the right ala of the thyroid, with raspatory and scissors. I unfortunately found distinct signs that the pharynx was involved. The galvano-cautery was applied freely. Bleeding was very profuse. After operation the wound

was tamponaded with gauze, and a fresh sponge was placed in the trachea. The tube was removed in ten days. The patient could then breathe well. The result of the operation has been complete relief from dyspnoea, and the patient can articulate in a whisper, though half his larynx has been removed. Recurrence of growth in the pharynx I looked upon as certain.

I last saw the case in January, 1902. The growth was returning in the depths of the wound. Dyspnoea was entirely relieved. The main interest of this case is the great difficulty of estimating the actual extent of growth in advanced laryngeal cancer. I spent a fortnight over the study of this case, and concluded it was free of the pharynx, in which I was wrong. The case also affords a striking contrast to the others. It illustrates forcibly a clinical truth which all of us may lay to heart. That if an adult, especially a male, should suffer from abiding hoarseness and laryngeal irritation, no time should be lost in getting a careful laryngeal examination, so that if a growth exists it may be detected and dealt with in its earliest stages. The results, as shown by the cases detailed to-night, are as good as neglected cases are disastrous and unsatisfactory.

NOTES AND REFERENCE.

¹ Holmes's *System of Surgery*, 3rd edition, vol. xi, p. 637. ² The blade should be flexible and the teeth minute. ³ The patient was present at the meeting and read aloud with a good and distinct voice. ⁴ Recently seen (February, 1902), quite well, voice much improved.

SOME OBSERVATIONS ON THIRTY-FIVE CASES OF CHRONIC SUPPURATION OF THE MAXILLARY ANTRUM.

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THE following observations are based upon the notes of 35 cases of chronic antral suppuration seen in private practice during the past two years.

A far greater number might have been brought forward had my hospital cases been included, but the difficulty in following up the result of treatment in such patients is so great that no excuse is needed for presenting a comparatively small number as the basis of the present communication.

It has long been my conviction that empyema of the maxillary antrum is of greater frequency than is usually supposed and that it will frequently account for symptoms which at first sight do not suggest any connexion with the nasal accessory sinuses. In making this statement I am fully aware that those who make a special study of any branch of medicine or surgery, perhaps not unnaturally fancy or even believe, that a disease is common because their peculiar opportunities allow them to see many examples of it, and that this conception tends to grow "in spite of ourselves." But while making every allowance for this mental tendency I would still maintain and hope to show in what follows that such a conviction has not been arrived at without due consideration and a fair estimate of the results of experience.

ANATOMY.

Both in the same as in different individuals the antra vary as much in size as they do in the thickness of their component walls. From the points of view of etiology, symptomatology, diagnosis, and treatment, it must be remembered that the antrum communicates with the middle meatus of the nasal cavity by an opening situated near the roof of the antrum at the upper border of its inner wall, a disposition which renders drainage of the sinus a difficult matter except when the patient is lying down. Under the last-mentioned circumstances the contents of the antrum will flow backwards towards the naso-pharynx. The opening into the nasal cavity (maxillary ostium) is overhung by the middle turbinal bone, and therefore a purulent discharge issuing from the antrum would be seen in that cleft between the middle and the inferior turbinal bodies, known as the middle meatus of the nose.

Finally, an examination of a series of maxillary bones will show that the roots of the molar teeth, and often that of the second bicuspid tooth, approach more or less closely to the

floor of the antrum, and that not uncommonly the apices of the fangs form mammillated projections in the floor of that sinus. Such projections may be separated from the lumen of the cavity by a thin layer of bone, or only by mucous membrane. Under such circumstances the liability of the antrum to become infected by septic inflammation around the roots of the teeth is very obvious.

ETIOLOGY.

Whilst it was formerly maintained that antral suppuration was almost invariably due to infection from a carious tooth, it is now universally agreed that some cases are infected by way of the nasal cavities, and that the majority of these are met with as complications of one of the acute specific diseases.

During recent years influenza has been a somewhat prolific source of suppurative inflammations in the nasal accessory sinuses, while scarlet fever, typhoid, pneumonia, and diphtheria have accounted for a smaller number of cases. Under such circumstances the inflammation, which at first may be acute, passes gradually into the chronic phase. This transition may be due to the virulence of the primary inflammation inducing chronic congestion and increased secretion from the nasal mucosa which, in many cases, undergoes stagnation and provides a suitable medium for the growth of septic organisms. This tendency will be promoted when such pathological obstructions are present as postnasal adenoids, well-marked degrees of hypertrophic rhinitis, or difficulties of efficient drainage such as are met with in the antrum.

My own experience leads me to believe that dental caries is by far the most frequent cause of chronic antral empyema. Not only have diseased teeth been present in every one of the 35 cases herein considered, but in the scores of cases seen in hospital practice during the past ten years, I cannot remember having seen three cases in which evidence of past or present disease in the corresponding molar or bicuspid teeth was not present.

And here I would point out that although the crown of a tooth may appear perfectly healthy, a condition of pyorrhoea alveolaris may extend the whole length of one or more of the roots, and thus carry infection to the antrum. Furthermore, an abscess may be present between the roots of a tooth which possesses a healthy crown. I have exhibited specimens of both these conditions at the Laryngological Society of London.¹ Again, an isolated area of caries on the crown of a tooth must not be regarded as incapable of evil influence on the antrum, for septic infection may undoubtedly spread through the lymphatics of the healthy bone. In the two cases referred to my suspicions were attracted to the apparently healthy teeth because on exploration of the antrum for diagnostic purposes, the patient immediately complained of toothache in the first molar tooth.

It may be argued that the dental caries is secondary to antral suppuration and spreads from the root towards the crown of the tooth, but such a course of infection must be exceptional, for careful inquiry will nearly always elicit a history of dental trouble which preceded the antral symptoms. Then again, the rapid improvement of antral empyemata which often takes place when a septic tooth is removed would suggest a causal relationship; improved drainage will not explain the improvement, because efficient intranasal drainage is often ineffectual until the suspicious tooth has been extracted.

Four of my cases are of interest in that the frontal, ethmoidal, and sphenoidal sinuses were also in a state of chronic suppuration, but I have been unable to ascertain what was the primary source of inflammation in any one of these patients. It may be that all the sinuses were infected simultaneously, or that the higher sinuses were alone primarily diseased, and that the antrum acted as a receptacle rather than as a generator of pus. Finally, and not improbably, the antrum was primarily infected, and in course of time its septic contents contaminated the anterior ethmoidal cells, and ultimately the frontal sinus. In one patient whom I have been able to watch for nine years this was certainly the course taken by the disease.

Three cases presented all the features of fetid atrophic rhinitis ("ozæna")—that is, the formation of fetid crusts in abnormally wide nasal cavities, the symptoms dating from