CASES OF LARYNGOSTOMY.

By Drs. Sargnon and Barlatier.

(Translated and abridged by Mr. Chichele Nourse.)

Appended to the paper by these authors upon the operation of laryngostomy, a translation of which has already appeared in the Journal, was a series of twelve cases in which the operation was performed. This record, which is full of detail, serves to show the difficulties which may be encountered during the progress of such cases, and how they may be met.

Seven cases were cured, four were still under treatment, and one proved fatal. The following is a brief *resumé*, embodying some of the chief points of interest.

Case 1.—A child, aged three and a half, with complete cicatricial obstruction of the larynx, following intubation and tracheotomy during diphtheria a year earlier.

Laryngostomy was performed by Dr. Rochet in November, 1905. The larynx was atrophied, and completely obliterated from the glottis to a centimetre from the cannula. As the tracheotomy was low a small piece of healthy tissue was left above the cannula. The cicatricial tissue was completely divided. At first dilatation was very difficult; in May, 1906, the upper part of the fissure closed, and was re-opened under general anæsthesia. At length the progress became rapid, and in January, 1907, the cannula and drain were given up. A few days later a suffocative attack was brought on by excitement; it was relieved by separating the lips of the wound. At this time the diameter of the larynx was ten or eleven millimetres. The organ was cylindrical; the lateral walls and even the anterior wall had become cartilaginous. The mucous membrane was pale, smooth and slightly cicatricial; it blended insensibly with the skin. The voice was weak but clear. The laryngeal fistula was one and a half centimetres in length.

An attack of measles in April, 1907, was accompanied by a red œdematous swelling of the larynx opposite the fistula, causing much dyspnœa. Sprays of water and of vaseline oil and instillations of oil of almonds were used to loosen the mucus. After this the patient was left without any further dilatation; her voice gradually improved. The cords re-appeared as two folds of mucous membrane just above the fissure, and approximated

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readily. The calibre of the larynx had diminished, but there was no difficulty in breathing through the mouth and nose.

A plastic operation was performed in February, 1908; two days later much swelling of the laryngo-tracheal canal caused serious dyspnœa, and the low tracheotomy wound was re-opened. Finally the operation wound closed, but in view of the sudden attacks of dyspnœa a small plugged cannula was left in place.

Case 2.—A child, aged seven, who had been unable to dispense with a tracheal cannula since an attack of croup two years before.

Laryngostomy was performed by Dr. Rabot. At the operation cicatricial stenosis in the cricoid region was found. The vertical incision was carried from the upper border of the thyroid cartilage downwards to a point about a centimetre above the cannula. Three days later this bridge of tissue above the cannula was suppressed as it was found to interfere with the adjustment of the drainage-tube. Dilatation proceeded rapidly and was well borne; at the end of six months the larynx admitted a tube of No. 29 calibre, and the child could breathe quite easily through the larynx. A plastic operation was then performed, but a small fistula remained in the neck through which air passed during coughing or other forced efforts at expiration.

Three other attempts were made to close the opening, twice under local anæsthesia and once under a general anæsthetic, but a minute fistula persisted. The child, however, seemed well, and could sing as well as speak.

Case 3.—A boy, aged eleven, for whom tracheotomy had been performed during an attack of measles at the age of eight. The cannula could not be given up, and two years later treatment by dilatation with bougies and with a winged cannula was pursued for several months, but, partly owing to the intractability of the patient, the result was unsatisfactory.

Laryngostomy was performed by Dr. Rabot under local anæsthesia. As the tracheotomy was a low one the median incision included the thyroid isthmus, which bled freely.

In this case a crescent of cicatricial tissue existed at the level of the cricoid cartilage, on the posterior and lateral walls, leaving a sufficient breathing space in front. But, as in all the other cases, this space was encroached on by a tracheal spur, projecting obliquely downwards and backwards. As is also usual in such cases, the vocal cords were irregular and much swelled.

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PLATE I.



Fig. 3, Case 2.—The same patient three months after the last plastic operation. Two very small openings remain, which allow mucus to exude during cough.

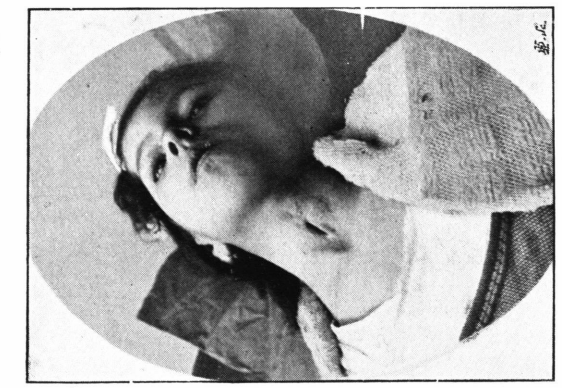


Fig. 2, Case 2.—Photograph of the patient after dilatation. The fissure includes the old tracheotomy wound.

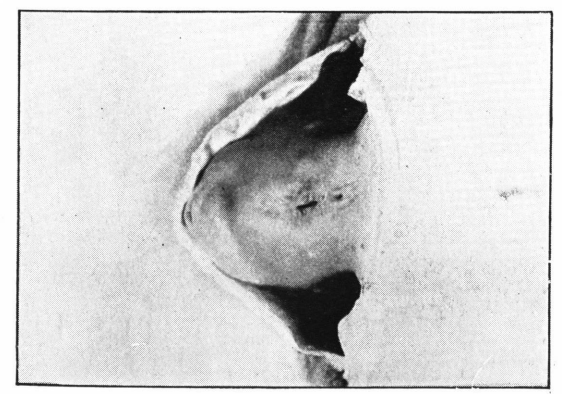


Fig. 1, Case 1.—Photograph of the patient after dilatation. The fistula resulting from the low tracheotomy is seen below. Above is the aperture of the laryngostomy, and between the two openings is the bridge.

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PLATE II.

FIG. 6, CASE 3.—The same patient several months after suture. A minute fistula still exists.

FIG. 5, CASE 3.—The same patient ten months after dilatation. The fissure has become much smaller from above downwards. This was the only case in which almost complete spontaneous closure was observed.

FIG. 4, CASE 3.—Photograph of the patient immediately after dilatation.

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PLATE III.

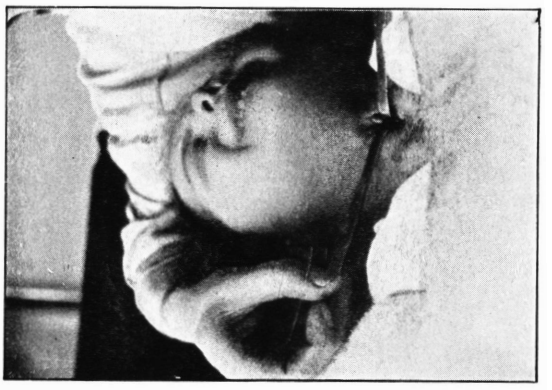


FIG. 9, CASE 5.—The same patient with the canal opened by retractors, preparatory to dilatation.

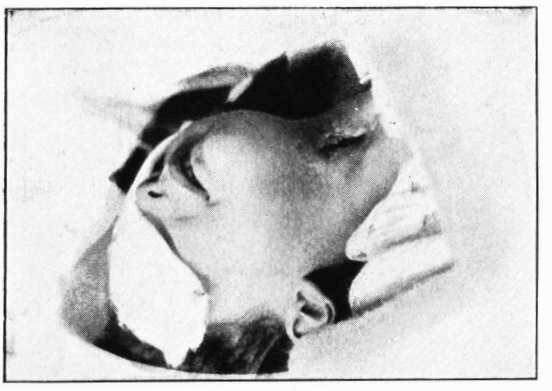


FIG. 8, CASE 5.—The same patient with the cannula removed.

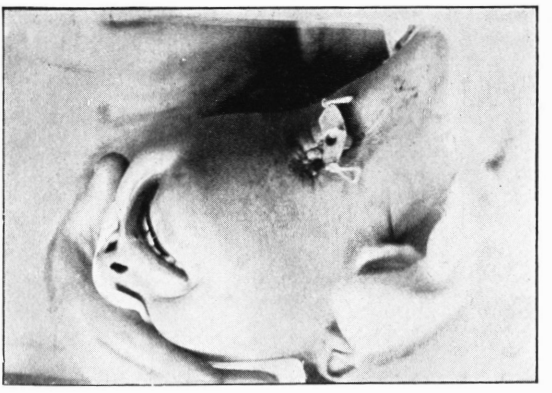


FIG. 7, CASE 5.—Photograph taken three weeks after the operation.

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The operation was followed by a slight attack of bronchitis, to which the patient was subject. After this had passed off dilatation progressed favourably. It was commenced with a No. 20 tube, and at the end of six weeks No. 36 could be introduced. Then an open drain was used for some days, but it was found that food passed down it and was rejected through the cannula. A shorter and smaller tube, plugged with gauze, was then employed. Once the gauze became loose and slipped into the trachea. After three and a half months of treatment the patient was cured, except for the existence of a fistula 12 mm. long. Six months later a plastic operation was performed, after which only an insignificant opening remained.

Case 4.—A child, aged four. In January, 1907, an attack of membranous laryngitis necessitated intubation followed by a low tracheotomy. The membrane contained streptococci, staphylococci and diplococci, but no Klebs-Loeffler bacilli. After recovery the cannula was still required. The larynx was found to be occluded by cicatricial tissue. Laryngostomy was performed on March 1, and all went well until the sixth day, when the wound was found to be covered with a membranous exudation, spots of which extended into the trachea. Broncho-pneumonia developed, the membrane became more extensive, the patient coughed up membranous casts of the bronchi and large pieces of exudate, and death occurred on March 8.

Case 5.—A child, aged six, was intubated on account of an urgent attack of dyspnœa due to laryngitis, and continued to require the tube after the attack had subsided. After sixteen days the tube, accidentally expelled, could not be replaced as usual, and tracheotomy was performed. All attempts to relinquish the cannula having failed, laryngostomy was performed twelve months later. There was almost total closure of the larynx at the level of the cricoid. The case progressed well. At one time sloughing became too marked, and the tube was replaced by a vaselined gauze plug.

Dilatation was commenced with a No. 16 tube, which was left undisturbed until the first dressing three days later. The following day the stage of sloughing began; it was so marked at the end of another day that the tube was replaced for twenty-four hours by a plug of gauze covered with vaseline. Dilatation was then continued by increasing the calibre of the tube each day.

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After eight days sloughing had ceased, and granulation commenced. The drainage-tube then became displaced upwards, and a smaller one was substituted, and once it was displaced forwards. Dilatation was continued for five months; at the end of that time the patient could breathe well without either tube or cannula. The fistula gradually became smaller and was kept covered with a dressing so as to prevent the passage of air. The speaking and singing voice were a little hoarse at first, but gradually improved.

Case 6.—A girl, aged eleven, who had been unable to breathe without a tube or a cannula since an attack of diphtheria at the age of six. Many fruitless attempts had been made to restore the parts to their natural condition; the child had been intubated one hundred and seventeen times, and had undergone four tracheotomies.

The cricoid cartilage was ossified, and the lumen of the larynx much narrowed at this point. The progress of the dilatation was rendered slow and difficult by this condition, but at length the stenosis yielded, and after five months of treatment the dilatation was considered sufficient and the tube removed. In a short time, however, the stenosis began to reappear, so that it became necessary to revert to the drainage-tube. Dilatation was then continued for three months, but the tube constantly became displaced, and scar tissue tended to recur.

The cicatricial tissue was then divided under local anæsthesia, and a fresh effort made to render dilatation effectual. The child was unmanageable, and the drainage-tube often slipped out of place. Then a longer tube was used with an aperture in the lower part, through which the tracheal cannula was passed (Fig. 4, p. 481). The threads from the tube were fastened to the outer cannula as usual. This plan seemed to answer well; the case is still under treatment.

Case 7.—A child, aged six, who had worn a tracheal cannula for three years. Laryngostomy was performed by Dr. Vignard, who found the larynx completely occluded from below the cricoid to the level of the vocal cords. The cicatricial tissue was carefully divided and a No. 18 tube was inserted. In this case the sloughing process commenced two days after the operation, and soon became excessive. The tube was replaced by vaselined gauze for four days, and the sloughing diminished, but it did not completely cease for a month. The patient had slight fever at first, but no

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PLATE IV.



Fig. 10, Case 6.—The fistula is very large owing to the difficulty and long duration of the dilatation. The child, now aged 12, wears a No. 38 tube.

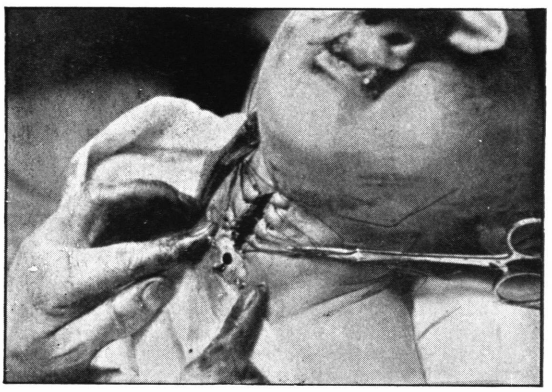


Fig. 11, Case 7.—Photograph of the patient, taken during the operation immediately after the suturing.

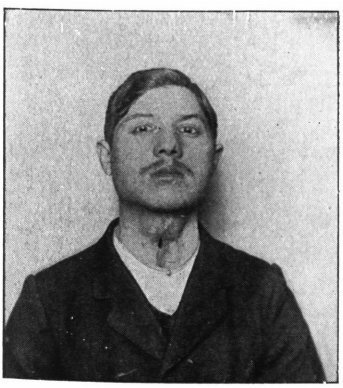


Fig. 12, Case 8. — Before the plastic operation. The thickening of the thyroid cartilage is due to the injury.

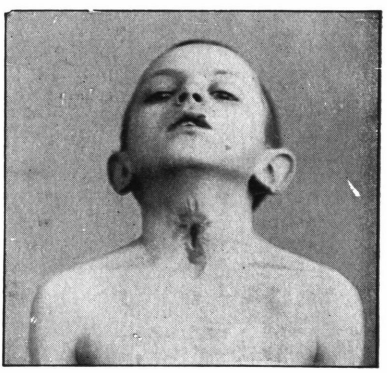


Fig. 13, Case 10. — Laryngostomy for papillomata. The patient is still under treatment.

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pulmonary symptoms. After two months of treatment the cannula and drainage-tube were left off for four days, but the cicatrix rapidly came back. The treatment was then resumed for two months more, but it was again interrupted for two days, owing to an ulceration in the trachea. After this, dilatation was continued for ten days more, and then finally discontinued. At this stage respiration was satisfactory, but speech was very defective. Six months later the child was in a good state of health, breathing well, but the voice was weak and badly produced. The length of the fissure was 24 mm.

Case 8.—A man, aged twenty-one, in whom laryngeal stenosis had followed a suicidal wound in the throat a year before. Laryngostomy was performed by Drs. Delsaux and Sargnon in the usual way.

The cricoid and thyroid cartilages were ossified, and were divided by Moure's cutting forceps. The obstruction was caused by a thick cicatricial membrane in the subglottic region.

Treatment was pursued without incident, and at the end of two months the patient left the hospital still wearing the dilating tube, through which he is able to breathe, and the cannula, which is kept closed. After four months of dilatation the tube and cannula were discontinued, and the wound in the neck closed by adhesive plaster.

Case 9.—A man, aged twenty-seven. During convalescence from typhoid fever two years previously inflammation of the larynx demanded tracheotomy, and for nearly a year fragments of necrosed cartilage continued to come away. Laryngostomy was performed by Drs. Sieur, Rouvillois and Sargnon.

The cricoid and thyroid cartilages were very hard and almost calcified; when they had been divided the interior of the larynx was seen to be much narrowed from the vocal cords to the cricoid cartilage. The lining was œdematous and thickened, but there was no cicatricial stenosis. There was shrivelling of the cartilages from chondritis and perichondritis; the cricoid was much narrowed. After the operation, dilatation, although rather painful, proceeded satisfactorily for five months, when a No. 45 tube was being worn. The patient was then discharged, and returned three months later for a plastic operation.

Case 10.—A child who had undergone tracheotomy for papillomata of the larynx causing asphyxia. The stenosis persisted, and laryngo-fissure was performed, followed by application of the

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galvano-cautery. The papillomata recurred, and the child continued to wear a cannula.

When laryngostomy was performed the cricoid proved to be ossified, and the cavity of the larynx as far down as the tracheal cannula was choked up with papillomata. These were removed with a curette, and a cicatricial band at the back was divided. Some weeks later more papillomata appeared and were removed. Dilatation proceeded rapidly in this case, but closure of the fissure was purposely delayed. The case is still under treatment.

Case 11.—A child, aged eight, for whom intubation and then tracheotomy had been performed consequent on an attack of laryngeal diphtheria a year and a half before.

The cricoid was ossified, and the larynx was obstructed by numerous cicatricial bands. The anterior tracheal spur was well marked. A tube, No. 24, was inserted at the time of the operation. The stage of sloughing commenced two days later. During this time every spot of sphacelus was carefully touched with tampons soaked in oxygenated water. On the eleventh day the child returned home: from this date the wound progressed well, but applications of silver nitrate and the galvano-cautery were required to control exuberant granulations.

Six weeks from the date of the operation a tube, No. 30, was inserted; after that the gauze plug in the drainage-tube was omitted, and a fenestrated cannula used, so that respiration could take place through the larynx. A few days after, a mass of granulations in the laryngeal vestibule blocked the tube; after an unsuccessful attempt to destroy them with the cautery they were removed with a curved curette and a longer tube was employed.

Later another difficulty arose. A cicatricial narrowing of the trachea just above the curve of the cannula made its appearance. A long drainage-tube was then prepared with an anterior aperture in its lower part through which the tracheal cannula was passed. This formed an immovable apparatus which succeeded well.

At the time of reporting the case dilatation was complete; the child could breathe well and was waiting until it was prudent to perform a plastic operation.

Case 12.—A child wearing a tracheotomy tube after an attack of diphtheria. Laryngostomy was performed quite recently. The larynx was atrophied and the cartilages softened. So far the case is doing well.

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The calibre of the drainage-tube used in each case is given according to Charriére's gauge, in which each number corresponds to one third of a millimetre in diameter. Thus tube No. 30 is ten millimetres in diameter.

In this *resumé* the patient's age at the time of the operation is given where possible.

Quite recently an article from the pen of the same authors, entitled "Contributions to the Study of Laryngostomy," has appeared in *La Revue Hebdomadaire de Laryngologie, d'Otologie, et de Rhinologie* (October 31, 1908), which embodies the results of further experience.

In the main the operative technique remains the same, but some points of detail have required modification.

The frequency with which ossification of the cricoid cartilage is met with, even in young patients, is noted. The authors often make use of Moure's cutting forceps, which are very useful in such cases. They have altogether given up the plan of leaving a bridge of tissue above the cannula, and now advise that whatever was the level of the tracheotomy the laryngostomy incision should always be commenced at the tracheal orifice.

When the laryngeal occlusion is very marked it is best to divide the cricoid ring behind; plenty of room for dilatation is thus obtained, without adding to the gravity of the operation.

The sloughing stage ought to have come to an end by the seventh or eighth day after the operation. It can be controlled by using a tampon of gauze instead of a drainage-tube for two or three days. The sutures should be removed about the fifth day.

In troublesome cases, especially where the tube continually slips, Fournier's method of passing the cannula through an anterior aperture in the lower part of the drainage-tube is warmly advocated. One advantage is the fixity of the apparatus; moreover it can be left in place for as many as six days, the outer dressing only being changed daily and the parts cleansed. By the use of this method dilatation becomes very rapid.

It is advisable to push the dilatation as far as possible, as there is always a little loss of calibre afterwards. For adults it should be carried up to No. 45, for adolescents to between 36 and 40, and for very young children to about 30.

Several months should be allowed to elapse after the cure of the stenosis before a plastic operation is undertaken. The authors advise that the interval should include at least one winter. They prefer Gluck's plastic operation.

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