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Original Articles.

LARYNGEAL STENOSIS DUE TO COMPLICATION OF THE THYROID CARTILAGES.*

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In November, 1898, Private Jacob H. M., Fourth U. S. Infantry, came under my observation. He was entirely aphonic and breathed through a tracheotomy tube. With pencil and paper all queries were intelligently answered and the following history was elicited:

He was in the second year of a second enlistment. While lying down on the fighting line at the battle of El Caney, July 2, 1898, he received a wound over the right frontal bone, from a Mauser bullet. His sensations at that time were such as follow a stunning blow, though there was no loss of consciousness, for he remembered everything that occurred. There was some slight bleeding from the bullet's point of impaction and very profuse bleeding from the mouth and nose. There was a sensation of rasping as though a saw was passing up and down through his head on the right side, and he had difficulty in getting air enough, for it seemed to escape somewhere before it got into his lungs. With it all he had a severe chill.

In about three hours litter-bearers arrived and carried him to a field-hospital, where his wound was dressed. Some water given him produced strangling and he found that he could not swallow; his thirst was assuaged by moistening a piece of gauze and placing it between his teeth, the jaws were quite firmly wedged together by this time. The jaws slowly relaxed and six days later, July 8, he was able to swallow a little at a time. A long string of tissue hung from his mouth; this he pulled away with his fingers. He had been transferred first to the division hospital and then to the ship *Relief*. On board the ship he began to eat, but not without strangling. He was then placed aboard the transport ship *Seneca* for return to this country. There the fare consisted of hardtack and coffee, and after three days bacon was added; some of this he swallowed. During all this time he had not slept six hours because of constant noises in his head. On July 26, 1898, he landed, and was sent with other wounded soldiers to a general hospital in New York City. He described a terrible choking sensation occurring soon after his admission to the hospital, following an attempt to swallow whisky and oil. His breathing was always difficult at that time; a walk of ten paces exhausted him. His

breathing became more difficult each day, and on August 3 tracheotomy was performed, followed by complete relief. His dysphagia was much better, and he partook of solid food. One night while at stool, after much straining, a metallic substance passed from his rectum; no attempt was made to recover it. His history obtained from this hospital is as follows:

Soldier U. S. A., age 25, admitted July 26, 1898. Father living, good health. Mother died at 57 of typhoid fever, three brothers living aged 34, 30, 19, in good health. Two sisters, 28, 20, good health.

Personal history:—He had typhoid fever in 1894; general health good; on July 1 at El Caney was shot with Mauser bullet above right eye, *glancing wound*; dressed at division hospital and recovered rapidly; was exposed to rain-storm shortly after, and from that time has been very hoarse, expectorated considerably, voice husky; on admission was hoarse and later on inspiration there was a retraction of the supra- and infra-clavicular spaces, with considerable difficulty in breathing. Dyspnea increased and on August 3 tracheotomy was performed under cocain, followed by relief to dyspnea. Diagnosis: "Stricture larynx."

December 5 he was transferred to New York Eye and Ear Infirmary.

Examination:—Over the frontal bone on the right (Fig. 1) there is a scar 20 mm. in length and 5 mm. in breadth. The lowest point is 3.5 mm. from the external canthus and curves to a point about 4 mm. from the center of the supraorbital notch. In the pharynx there is a notable absence of the greater portion of the posterior fold of the soft palate on the patient's right, some of it near the uvula and again near the tonsil being present. It presents the appearance of being gouged out. Alongside the tonsil is a line of reddened tissue which looks as though this fold had descended and become adherent. The left side is entirely normal.

Laryngoscopic examination:—A mass of mucus lies within the larynx, which is very tenacious and difficult of removal. An infundibulum is seen closed tightly and not even admitting a small probe. No air passes through. The inner walls of the larynx bulged at the center and the lowest portion was on a line with the site of the false vocal cords. There are no voice sounds whatever.

The clean-cut hole in his soft palate and the comminuted appearance of his larynx, together with his history, led to the diagnosis of a stenosis due to gunshot wound, the bullet taking a most remarkable course.

Instead of his having had a glancing wound, as all surgeons heretofore had believed, the bullet entered directly alongside and over the eye. It then went through the superior maxilla downward and backward, cut through the posterior portion of the soft palate and entered the neck. Here it became deflected, probably by the hyoid bone, and entered the thyroid cartilage, thoroughly comminuting it, cutting into the esophageal wall where, being spent, it dropped into the stomach. It probably passed from the intestines some time in August, while at the general hospital. Fluoroscopic examinations and Roentgen-ray photographs failed to reveal the presence of any foreign body in the neck. He was

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admitted to the service of Dr. Morris J. Asch, who agreed with my diagnosis and kindly placed him in my charge. Under cocain anesthesia attempts were made to pass the hard-rubber fenestrated Schrötter tube of small caliber. These were persistently used, and on January 10 dilatation was followed by an attack of coughing and a mass of lymph was coughed up. A large chink resulted, and some air could be inspired and he was able to speak in a hoarse but strong voice. During February various larger sized Schrötter tubes were introduced, the patient breathing through the fenestration at the lower end of the tube.

On March 7 a large sized O'Dwyer tube was inserted and after a few hours was coughed up.

March 20 he was again intubated under cocain, after many attempts; the tracheotomy opening was packed with gauze. He was unable to swallow with the intuba-

Fig. 1.—Cicatrix shows entrance of bullet.

tion tube and he was fed by means of the stomach tube.

March 24, in a severe coughing spell the tube was coughed up, after four days of intubation and the tracheotomy tube reinserted. The next day he was readily intubated, the tube remaining but one day *in situ*, the tracheal tube being again inserted. The Schrötter tubes readily enter.

April 17, an intubation tube was inserted, having a small rectangular piece screwed through the tracheotomy wound, into a hole previously made in the intubation tube. The screw of this was too short and the tube was coughed out four days later.

April 24, an adult intubation tube had been introduced and a heated iron passed through the tracheal wound to the tube thus marked the point opposite the opening. Following the suggestion of Dr. John Rogers, Jr., of this city, a large threaded opening was made in the intubation tube opposite the tracheal opening and the solid tube was made to screw in—a small plug being inserted to prevent its unscrewing when *in situ*. The final appearance is similar to the arrangement

in glass described by Werner Kummel¹ of Breslau. This tube remained *in situ* for six weeks, the patient being fed every three hours by means of the esophageal tube inserted through the nose. During all this time he was unable to swallow. He breathes well, goes about, and enunciates clearly. A small piece of tissue flaps to and fro low down; some narrowing of the lumen of the larynx still exists. A new O'Dwyer tube with the Roger attachment was readily introduced. He left hospital on June 29, wearing this tube; he had meanwhile learned to feed himself by means of the esophageal tube. He was readmitted July 20, 1899.

The tube was removed and a large space was visible in his larynx. His voice was clear, his respirations free and the tube was not reinserted. The external opening was closed and daily applications were made to the thickened tissue in the larynx. His comfort was extreme, his voice clear and distinct; except for some loose flaps quite low down there was no visible abnormality. This comfort lasted for ten days, when the patient complained of some dyspnea and following an application to his larynx the dyspnea became extreme. This attack of dyspnea became so intense that I hastily operated in my office and introduced a tracheotomy tube.

August 1 he was reintubated, followed by a septic condition, and on August 5 tube was removed. From

Fig. 2.—Showing hole made by bullet.

now on Schrötter tubes of increasing caliber were introduced daily until March 1, 1900, in the following manner. A 4 per cent. solution of cocain was sprayed into the larynx, the tracheotomy tube withdrawn, a Schrötter tube of very large caliber was introduced beyond the tracheal orifice, and the patient breathed through the tube, keeping it in position for twenty minutes. The tracheotomy tube was reinserted on the withdrawal of the Schrötter tube, the opening was corked up and patient breathed easily for fully two hours. The problem here was to find an intubation tube that would not be coughed up, would permit of deglutition when *in situ* and could be introduced with the least discomfort to the patient. It was noticed with regard to the latter point that Schrötter's tubes, being hollow all the way through, were readily introduced and were not at all annoying, while on the other hand the usual intubation tube with its introducer cut off the air to a most disagreeable extent and was difficult to insert. I therefore had made for me a tube whose head was as low as possible, with no retaining swell, and with a threaded opening for a screw piece, and finally a hollow introducer, which I here exhibit (Fig. 3). Intubation was as sim-

1. Archiv f. Laryngologie, 1896, Vol. iv, p. 72.

ple and easy a problem as one could wish. The new tube was introduced and left *in situ*. In the meantime his general condition was so poor that he began to show some signs of sepsis and the tube was removed. He had been in the hospital, except one month, for a year and a half, and it was deemed advisable to send him to some army hospital where the change of air, combined with a rest from treatment to his larynx, would give him the opportunity to recuperate and enable us to conclude our methods at dilatation eventually. Accordingly he was transferred to Governor's Island in New York Harbor and within a month increased 20 pounds in weight. An examination of his larynx, June 1, shows some diminution of the space about the center of the thyroid cartilages, which appear as if bent in. The vocal cords are plainly visible and perform their function. Some narrowing of the space on a line with the cricoid still exists. His condition is materially improved and I see no reason why, with an intubation tube that permits deglutition, we may not eventually anticipate a perfect cure.

The points of interest in the case are the acceptance of a glancing wound of the frontal bone as a correct

Figure 3.

diagnosis by all surgeons until I saw him, the remarkable course of the bullet, which failed to injure his eye, important nerves or blood-vessels, the early restoration of his voice and the tolerance of his larynx to dilatation, and finally to the use of an entirely new method of intubation, which the writer hopes will render subsequent attempts at intubation, in chronic stenoses at any rate, much more agreeable to both the patient and to the physician.

DISCUSSION.

DR. W. H. DALY, Pittsburg—These cases are very rare. Several years ago, I do not know how many, but some of the old members of the American Laryngological Association may remember, I collated all the cases I could find of gunshot wounds of the larynx, and they were very few in number. I made a very careful search in the Army Medical Museum and other places and could find only very few cases.

Dr. Cohen saw a case with me which was very interesting. A ball, I think a 22 caliber, had pierced the thyroid bone and had severed both true vocal cords. I saw the case about two weeks after the wound was sustained. At that time the young man was lying in a very critical condition. The ball had not been discovered, and with the attending surgeon we made a very careful search for the bullet. The ball had entered somewhere near the angle of the jaw in a downward direction. The boy was not able to speak. After a careful search we found a spot behind the collar bone of the opposite side, over which there was great tenderness. I suggested that we cut down on the parts, making a careful dissection, and while there was some objection, we finally prevailed, and we found the ball resting on the subclavian artery. Part of the coats of the artery was absorbed by the pressure. Certainly, in a very short time, the bullet would have caused ulcerative absorption and hemorrhage. Afterward I asked our eminent colleague, Dr. Cohen, to examine the patient. With the use of the laryngoscope he made a very careful examination, and I think we agreed that the boy would never have an audible

voice. We did not see how it was possible with the amount of ulceration and traumatic damage done to the larynx. However, I brought the patient to Pittsburg, and after prolonged care he recovered, without much traumatic stricture of the larynx, and in about a year or a year and a half, he had an audible voice and afterward he became able to shout. He entered on the study of medicine, and is now a graduate, and can use his voice very well. The case shows the tremendous amount of damage that may be done to the larynx and pretty good results follow.

DR. J. HOLINGER, Chicago—About five years ago a new tracheotomy tube was devised by Dr. Thilo, of Chicago. The instrument consists of two pieces on the principle of a duck bill. It would fully comply with all the requirements necessary for an intubation tube in this case. The instrument is very easy to be inserted, and deglutition is possible with the tube in situ. It is self-retaining. So far, this instrument has been buried in the reports of the Chicago Medical Society, and no instrument-maker is willing to take it up because there are so many varieties of the O'Dwyer tubes. But I know it is a good thing.

DR. EMIL MAYER, closing the discussion—I am desirous of knowing something about that tube, as it would be of advantage to procure one that will remain in the larynx.

PAPILLOMATA OF LARYNX IN CHILDREN.*

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CHICAGO.

Papillomata of the larynx is undoubtedly the most frequent neoplasm found in the larynx of children, where fortunately pathologic growths are not of frequent occurrence.

In an article by Rosenberg,¹ of Berlin, he states that out of 5808 children under 13 years of age, 16 cases of papillomata were found, that is, 1 in 363 cases examined.

Schrötter found the ratio about 1 in 700, Baumgarten states the condition was rare in his clinic.

In my own clinic I find the disease occurring once in about every 1200 cases. It has been my fortune to see 5 of these cases, 3 in private and 2 in clinical practice, the histories of which I shall briefly relate:

CASE 1.—In March, 1896, a little girl, aged 6 years, was brought from Montana to consult Dr. M. R. Brown, of this city. At the time, Dr. Brown was unable to take care of the child and he referred her to me. She gave the history of diphtheria two years before, since which time she has been gradually growing hoarse, and during the last six months breathing has become difficult. The general condition of the child was below par and it was with the greatest difficulty that a glimpse of the larynx was obtained, revealing nearly the entire cavity filled with a cauliflower growth of a pale greyish-white color. After consulting with Dr. Brown, I decided to first do a tracheotomy for the relief of the dyspnea. Five days later thyrotomy was done and the growth was found attached to the false and true cords and extending up on the inner side of the aryepiglottic fold. It was removed with scissors and curette; the base was cauterized with chromic acid. At the end of four weeks the mother insisted on taking the child home, and as no recurrence had taken place the tube was removed. The growth recurred five months later and tracheotomy was again done by the local physician.

CASE 2.—In January, 1897, a boy, 9 years old, was sent to me from an interior town, with the following history: One year before, the boy had a sore throat and

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1 Archiv f. Laryngologie.