Intubation in Cases of Foreign Bodies in the Air-Passages

WITH

REMARKS CONCERNING FEEDING AFTER INTUBATION

BY

S. J. MELTZER, M.D.

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W. G——, a boy, aged three years, while crying with his mouth filled with food, was suddenly seized with a choking spell. The mother, who was attracted by this circumstance, supposing that food had become lodged in the air-passage, turned the boy upon his head, slapped his back, and finally administered syr. ipecac in sufficient doses to provoke vomiting. The violent symptoms abated, and the boy is said to have slept peacefully the following night. In the morning, however, his voice appeared hoarse, and his breathing in the course of the day became more and more labored. I saw the child about 3 P.M., some twenty hours after the choking spell. The symptoms which presented themselves were those of a case of croup in a tolerably advanced state; and, indeed, without the preceding history I would certainly have diagnosed it as a case of croup. Having been unsuccessful in an attempt to relieve the child by the endolaryngeal method, I advised to consult a laryngologist. Upon my return, after the lapse of three hours, I met my colleague, who had also fruitlessly endeavored to relieve by the laryngoscopical method. He considered tracheotomy as the only means

out of the difficulty. The child, however, had at once to be relieved, as its condition in the meanwhile became very critical. The child lay comatose, its face intensely cyanotic, pulse very feeble, frequent, and intermittent. The supraclavicular and sternal contractions increased to their utmost, and no air found access into the lungs. Many difficulties presented themselves to the immediate performance of tracheotomy; I therefore conceived the idea of trying intubation. With the assent of my colleagues present, I introduced an O'Dwyer's tube into the larynx, and relief thereupon followed. The child breathed freely, the pulse improved, the cyanosis disappeared—in short, the condition was nearly a normal one. I did not remove the tube, but so wrapped the child in a blanket that it could not free its hands and seize the thread. Small pieces of cracked ice were alone given to the child, and a constant watch upon the latter was ordered. The child passed a good night, the peaceful slumber being only now and then interrupted by coughing. Toward morning, however, the watching grandmother loosened the blanket, and fell asleep, whereupon the little patient, during a coughing spell, seized the thread and pulled the tube out. When I came I found the child breathing perfectly free, without any sign of stenosis or dyspnœa. Upon examining the tube I discovered that it was half-filled with viscid mucus, and that it contained, besides numerous small particles, a comparatively large, pointed piece of a nut-shell. Although the larynx did not cause any trouble, a rise of temperature appeared the same day, which, as was soon proven, proceeded from a fibrinous pneumonia. The development and course of this illness was not of sufficient importance to be reported in detail. There first appeared symptoms of a pneumonic infiltration of the entire lower lobe on the posterior surface of the left lung. Five days later there also appeared a pneumonia of the right side, posteriorly and inferiorly, but not so extensive or severe as that of the left side. The temperature was moderate, but slightly above 102° F.; the general condi-

tion satisfactory, only a painful cough was present which reminded one of pleurisy. In fact, the dulness was so striking on the left side, even before the bronchial respiration appeared, that I, in spite of the origin, carefully looked out for the differential diagnostic symptoms of pleurisy and pneumonia before deciding upon the latter. Over the dull areas fine crepitant râles and vesicular breathing were present during the period before the appearance of the bronchial respiration; the areas of dulness remained unchanged in all positions. The dulness was not increased from above downward. The vocal fremitus was increased, that is, very pronounced, during the first few days, before the pneumonia invaded the right side. It is very probable that the infiltrated areas lay superficially. The fever disappeared two weeks after the beginning, and terminated by lysis. The dulness, which outlasted for a long time the bronchial respiration, disappeared gradually about three weeks later. Nothing remained; the child is perfectly well.

That we are here dealing with a foreign body in the larynx need not be further explained. The stenotic symptoms, however, did certainly not originate from a direct obstruction of the glottis by the foreign body—the latter was too small to cause this. It could, though, be conceived that there were other small particles present, which were coughed up and swallowed, and that the amount of these might indeed have occluded the glottis. In a direct occlusion, however, the first attack would not have passed off, and the second deciding attack would not have been developed relatively so slowly. It is much more probable that the first choking spell was produced by a spasm of the glottis, which was reflexly induced by the foreign body, whereas the subsequent gradually developing stenosis was occasioned either by a submucous swelling or by œdema of the glottis, which the irritation of the foreign body resting in the larynx might have provoked. We certainly find in literature mention of cases where foreign bodies remain for a long time in the larynx without caus-

ing any reaction. Still, these particles lay chiefly in a ventricle of Morgagni; whereas our piece of nutshell, by the nature of its pointed condition, might have been lodged near the edge of a vocal cord, where, on account of its frequent movements, the irritation must have been more frequent and intense.

The removal of the foreign body from the larynx can be explained in two ways; either that the body already in the larynx lay embedded in viscid mucus, thence by the introduction of the tube the body, with viscid mucus, became adherent to the lower end of the tube, and was forced into the tube by coughing; or that in pushing the tube into the larynx the body fell down into the trachea, and upon coughing was forced up into the tube.

The origin of the pneumonia in our case cannot be attributed to the intubation. The tube remained relatively but a short time, and the child received nothing to drink while the tube was in the larynx. It is much more probable that the pneumonia originated from aspiration of very small particles during the choking; we certainly found a large number of these embedded in the mucus besides the larger piece.

As far as I can review the literature, the present attempt appears to be the first where intubation was performed for the treatment of foreign bodies in the air-passages. It is therefore appropriate to discuss how far intubation may be brought into play in the cases mentioned. Although this case terminated satisfactorily, it is yet apparent that this method will not only be of no avail in some cases, but will, on the other hand, work direct mischief in many cases. If, for example, the foreign bodies in the larynx be larger than the lumen of the tube appropriate for that particular case, then certainly intubation will be useless; it will, on the contrary, apparently do harm, as the body will be pushed from the larynx into the trachea, and the chance for the now expedient tracheotomy will be greatly impaired, as there is more prospect of success in tracheotomy to remove the foreign body when in

the larynx than when it is in the trachea. I shall therefore attempt to state the conditions under which intubation in cases of foreign bodies in the air-passages appears permissible and advisable. Firstly, where we can with certainty assume that the foreign body lies in the trachea or in a bronchus. In this case there exists no contra-indication. In all these cases intubation should be performed and developments awaited. If the foreign body be smaller than the lumen of the tube, it will be dislodged by the severe coughing attacks always present, in addition to which the fluids which now and then flow down through the open tube may also be of service in facilitating its removal. If the foreign body be larger than the lumen, the success of tracheotomy will not in any respect be impaired if compelled to resort to it after the unsuccessful issue of intubation. In cases where the body dwells in the larynx the case is different. If the foreign body be sufficiently large to occlude the glottis, and the first choking attack do not pass off, then certainly tracheotomy should at once be preferred, if there only exists a possibility of performing it. If, for some cause, such a possibility be not present, then an attempt should be made to push the foreign body into the trachea by means of intubation. The trachea is much wider than the larynx, and what fills the former will allow the passage of air in the latter; besides, the tube lying in the larynx will prevent the foreign body from again becoming wedged in it, so that by the intubation a respite is gained for the possibility of a subsequent tracheotomy. In cases where the body does not occlude the larynx it is difficult to arrive at a conclusion. If the stenosis has assumed a dangerous aspect, and if it be for some reason not practical to perform tracheotomy at once, as in our case, then we ought unhesitatingly to intubate, and we may often avoid a subsequent tracheotomy, as the case above described shows. But if the case is not as yet very urgent, and tracheotomy can be performed with as great facility as intubation, then, in my opinion, it would be more rational to tracheotomize. If we cer-

tainly knew that the body could pass through the tube, then, in my judgment, intubation would certainly be indicated, with certain presumptions that the body would again be coughed out. But we have no hint of what size the foreign body may be, and it may possibly be larger than the lumen of the tube, though it is not large enough to obturate the rima glottidis. Should it be the case—should the body be larger than the lumen—then we still would not avoid tracheotomy; but then the latter presents a more favorable prognosis for the removal of the body if it be in the larynx than if it be in the trachea or fallen down into a bronchus.

To the cases mentioned I would like to add the further remark, that in a certain variety of foreign bodies in the air-passages intubation is unconditionally indicated, namely, where fluid deluges the lungs—the water, for instance, in drowned people, pus from a retropharyngeal abscess, blood in operations of the mouth, and especially the blood in pulmonary hemorrhages. Death in the latter cases mostly does not ensue from loss of blood, but from asphyxia, as the blood, which cannot escape rapidly enough, deluges the whole respiratory surface. Cases are cited in literature where tracheotomy under these circumstances was the means of saving life. I do not hesitate to state that in such cases intubation, to say the least, will prove of as great avail as tracheotomy. If we take notice what a large amount of fluid we may pour directly into the trachea after an intubation, without perceiving any threatening signs of asphyxia, we must conclude that the glottis alone is at fault if any fluid in the trachea can provoke asphyxia, inasmuch as the glottis is impelled to closure by the irritation of the fluid foreign body, and thus is the escape of this fluid prevented. At any rate we will not lose anything by intubating in such cases.

As an addition to the preceding communication, I desire to make a few remarks on a method of feeding after intubation. As is known, the question of how the child

is to be fed, is, in the eyes of many, the weak point in the method of intubation, on account of the danger of "Schluckpneumonie." I have explained in another place[1] that the pneumonia can only be developed through active expiration while the glottis is closed. A mere aspiration cannot draw anything, even it be ever so small, into the alveolæ. If this theory be correct—and I hope soon to be able to experimentally demonstrate its correctness—we need not fear the "Schluckpneumonie" as long as the tube remains in the larynx and prevents the closure of the glottis; we must but cease with the feeding for some time before the removal of the tube, and cleanse the trachea with a mild antiseptic. But even without the fear of "Schluckpneumonie" the feeding after intubation is very difficult, because most of the food makes its way into the trachea, and but a small quantity into the œsophagus, and, furthermore, the children stubbornly resist taking food at all. To think of feeding by means of the œsophageal tube is in such cases the more natural, as this method of feeding has already come into vogue in ordinary cases of diphtheria.[2] But the introduction of the œsophageal tube through the mouth meets many difficulties and induces vomiting, which we certainly should try to avoid. Latterly, therefore, I have tried to overcome the difficulties by introducing a soft catheter (silk or rubber) into the stomach through the nose, and left there permanently. Though my experience in its use is limited to but two successful cases, I will briefly explain this method (which I could not find described anywhere in literature) so that others may try it. It gives promise of good results.

The outer end of the catheter was connected with rubber tubing, which was knotted so as to prevent the outflowing of the fluid from the stomach, and to retain it *in situ* it was fastened to the ear by a thread. The children, both otherwise stubborn, made no attempt to seize

[1] S. J. Meltzer: Ueber die mechan. Verhältnisse bei der Entstehung der Pneumonie, Medicinische Monatshefte, 1889. Heft II.
[2] Renvers: Therap. Monatshefte, 1889. Heft III.

the tube. If nourishment was to be administered, a small funnel was attached to the tube; if the nourishment at times did not flow through, it was easily remedied by blowing into it a little. As food there was used milk, beef-tea, diluted wine, a little at a time, but frequently even during sleep; the child was never awakened by feeding. Into the mouth there was given only now and then a 1 to 10,000 solution of bichloride of mercury, in order to moisten the mouth, to induce cough, and to cleanse the trachea aseptically. Not a drop of this fluid entered the œsophagus; no attempt at swallowing could be observed. If anything were injected into the empty nostril the fluid would emerge from the other one, in which the catheter was placed, so that the catheter is no obstacle in the treatment of nasal diphtheria. In one of the children the posterior nares were so completely occluded with diphtheritic masses that I was compelled to bore through the latter with a prostatic catheter before I could pass a soft catheter through the pharynx. Both children, of different families, had pronounced diphtheritic croup, all the members of both families had had diphtheria, and, in fact, several times, and among them there were types of a severe nature. One of the two children had pronounced croup twice within a short period and recovered. The other child died, but neither from croup, "Schluckpneumonie," nor anything connected with the intubation or method of feeding. It was a four-year-old rachitic boy, with a very severe septic nasal diphtheria, and an acute nephritis; he died of cardiac paralysis.

179 East One Hundred and Ninth Street.