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OPERATIVE INTERFERENCE IN MEMBRANOUS DISEASES OF THE LARYNX.

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THE value of operative interference in membranous diseases of the larynx and trachea has been discussed at considerable length by the members of the profession. Its advantage has been decried by some, who, while admitting the value of it in lessening the terminal suffering, do not consider it of such importance in the prognosis as to warrant its frequency, picked cases doing well, while the average case only lingers probably a while and then dies; also the risks incurred during the operation. The collated statistics of foreign operations give no more flattering results than are reached in this section of the world. English surgeons had discarded, for a time, the operation as too unfavorable. The French surgeons gave more flattering conclusions, the latter giving an average of twenty-five to thirty-three per cent. of recoveries; yet, of cures from various parts of the world, gave but 21.48 per cent. The time of operation has to be considered in the prognosis. There is no question that the operation is left entirely too late, in the majority of cases it being the last resort, when the patient is exhausted by long suffering, the general vitality impoverished, and the absorption of septic matter having taken place; for, if the general con-



dition is lowered, then absorption of such fluids takes place more readily.

The operation of tracheotomy has many things to be considered; not only the operation itself but its risks; also the after-treatment. The difficulty in getting the consent of the friends of the patient leaves it until no other means are available. The thought of an operation and the uncertainty of its results make people hold off from such a procedure. Then come the risks of fatal results during the operation, which will, under the best care, happen occasionally. Then follows a long, tiresome after-treatment: the watching of the patient, cleansing of the tubes, the strict care of the thermometrical and barometrical condition of the surroundings, are all factors of importance. In the average practice this becomes almost an impossibility. The insufficiency of nursing and want of means are not to be forgotten. The latter does not allow of skilled attendants. The operator must either impose on his medical friends or depend on the care of those who are more often enemies than friends. And in these questions lie the result of the operation, for, no matter how skilfully it may have been done, if the after-treatment is not followed out failure ensues. Any one who has had any experience with these cases knows how much care and anxiety arise.

Then the age, extent of membrane, presence of pneumonia, and general diphtheritic infection have to be considered as contraindications, though many operators discard all these conditions and advocate operation. Age is not the barrier it was; it has been done before the end of the first year with good results.

Thus have years dragged on without any change in the procedure, until lately a means has been devised which accomplishes the purpose of tracheotomy without its objectionable features, and the operation, classing all cases reported, notwithstanding the imperfections of the operator, gives an average of twenty-eight and one-half per cent. of recoveries. In this operation the gravity of the interference is lessened, the use of the knife being dispensed with, and for this reason the consent of the parents or friends can be more readily obtained. The operation is performed quickly, with little distress to the patient. The relief is immediate. Then the most important factor is the dispensing with all complicated after-treatment. No extra care is needed. The sufferer takes food and medicine as usual, and in every respect is treated as an ordinary case, without regard to the interference. No suffering follows it, as after the use of the knife. If the patient recovers there is no wound to heal, and no risks from occlusion of the chink of the glottis. Shock is not present, no ether is required, or preliminaries to get ready; then no condition contraindicates its use. This method is that of intubation.

The change cannot be appreciated unless seen; it is but a matter of a few seconds, but in that time the little sufferer passes from a condition of agonizing distress to that of comparative comfort. Respiration is easy, substernal breathing gives way to full-chest inspiration, the lungs get more air, and the blood becomes oxygenated.

The advantages of intubation over that of tracheotomy can be readily understood: the lessening of

the severity of the operation, the facility of employment, and immediate relief is got while the preparation for tracheotomy would hardly have been begun ; then the facility with which the patient can be fed and medicated ; and then the total absence of any need of worry in regard to the atmosphere surrounding the patient, for the air taken into the lungs is moistened while passing through the mouth and nose ; then, also, the ability of the patient to make known his or her wants, for in my experience all the cases were able to articulate. This is important, for many things without an answer from the patient can only be guessed at. Then the ease of introduction makes it applicable to all cases, for if it were possible to meet a case in which, after the introduction of the tube, aggravation of symptoms were to arise, it can be readily removed, and the patient is then no worse than before, but if tracheotomy has been done there is no return : the patient must take the consequences. Yet I cannot imagine a case in which relief will not follow intubation.

I have seen cyanosis to a marked degree, and respiration entirely substernal, and every breath one of agony ; and this changed to full-chest respiration, the cyanosis disappear, and the patient be in a comfortable sleep in five minutes after the tube was introduced. What better result than this can be imagined ? The breathing gives rise to no peculiarities that would ever call the attention of any one to its presence. Food and medicine are taken with ease, though at times a slight quantity of fluid may trickle into the larynx and give rise to coughing, but yet this is not very distressing.

The great advantage of this instrument lies in the fact that, as no knife has to be used, its early applicability is possible, and by this means a case that is apt to run to the bad is anticipated, and in any case difficult respiration is overcome, and the patient is rendered comfortable. We must admit that in a certain percentage of cases recovery occurs, and in cases of tracheotomy and intubation this self-limitation must be considered. All cases of recovery by either mode are not entirely due to the interference, so what the ratio would be no one is able to judge; but the uncertainty of the prognosis should put one on the alert, and I think that the operation cannot be done too early. I would not be understood to mean that all cases should be intubated at the first symptoms, but yet the practice of waiting until substernal breathing takes place I think is rather long, for, if sufficient air is not taken into the lungs to aerate the blood, impoverishment of tissue takes place immediately, lowered vitality is shown at once, and as force is not easily created is it not advisable to save all we can? The proper time of introduction should be when internal remedies show no response and the breathing becomes markedly sonorous. The time is not limitable: cases vary; some will reach the suffocative point within a few hours while others may run into days.

When substernal breathing is present, or has been present for any length of time, few cases escape a certain amount of blood-poisoning; and as the causes of death are suffocation, exhaustion, and blood-poisoning they should be averted. Then, if suffocation is overcome, or if it has not reached this stage, the les-

sening of the muscular effort in breathing, caused by the narrowed glotta, causes less exhaustion; and as less expenditure of muscular force requires less vitality, we then husband what strength we have, for our treatment does not keep the system at normal but only tries to prevent as much waste as we can; if the strength is saved we have then a possibility that the glandular system may be sufficiently able to overcome the flooding of the system with septic poisons.

To illustrate this method I will give the notes of a case in which I introduced the tube. I was called into the case by a friend on January 7th. The patient, a boy eight years old, had every evidence of a case of membranous croup. He had expectorated portions of tubular membrane. The pharynx was free from any deposit; it was inflamed, yet not much tumefied. The boy had been sick from the 3d inst., and, steadily growing worse, the doctor in attendance had suggested the advisability of the tube the day preceding the introduction, but for certain reasons his opinion had been set aside; but the difficulty in breathing was steadily getting worse and entirely substernal, the chest action being suspended and the alæ of the nose were showing the violent effort that was being made to get air into the chest; cyanosis was becoming marked. The respiration was sonorous and could be heard in the adjoining rooms. The boy was wrapped in a blanket to prevent struggling. He was held in the arms of one person while another steadied the head and the gag was placed in the mouth. On the introduction of the finger into the pharynx the glottis was found very cedematous, and

there was difficulty in passing the finger between its posterior wall and the posterior wall of the œsophagus. After securing the larynx the tube was rapidly inserted. There was immediate cessation of the harsh breathing; the gag was removed; the breathing then became soft and easy, so much so as not to be heard unless the ear was placed close to the mouth. Chest action set in immediately, becoming full and expanded with every respiration; the cyanosis disappeared very rapidly. The boy complained of no distress from the tube: the only remark he made was that "it felt funny." He was put into bed and inside of five minutes was dozing comfortably. His respiration had been 64 to the minute and temperature 102.1° ; pulse was not taken. The respiration fell immediately to 38 a minute.

I saw the boy two hours after the introduction. The respiration was 36 and temperature 101° . The face had a perfect flush; not the flush of hectic irritation but one due to the oxygenation of the blood from free lung expansion, and then the blood being decarbonized was thrown more freely into the capillary system, and the part being previously deprived of its stimulus had set in with renewed action and dilatation of the vessels had occurred. The fact of lowered temperature is against it possibly being due to hectic causes. The breathing still continued soft and easy. He had taken both nourishment and medicine without any interference from the tube. The voice was not interfered with except in volume. At 12 P.M., same day, the temperature was 102.1° ; pulse, 144; respiration, 30. He made no complaints from the tube, was resting comfortably, breathing still full and

easy, and taking nourishment without difficulty. The next morning, 8th inst., at 6 A.M., pulse became intermittent and heart failure was marked, but under stimulation he rallied and at 10.30 A.M. pulse was 120 and steady; temperature, 100.3° ; respiration, 36, and easy; tube still giving no annoyance except occasionally coughing spells. At 11 P.M., same day, pulse, 136; temperature, 102° ; respiration, 32; he was still resting comfortably. On the 9th inst., 7 P.M., pulse, 120; temperature, 101° ; respiration, 36; he had been comfortable, tube giving no annoyance; no difficulty in nourishing or medicating him. At 11.30 P.M., same day, pulse, 136; temperature, 101.1° ; respiration, 36. On the 10th inst., 10.30 A.M., pulse, 132; temperature, 102.2° ; respiration, 33. There was no discomfort in breathing; the lungs were beginning to exudate and ~~pulse~~ râles were just noticeable. The boy complained of no distress or inconvenience. As the boy's breathing and general condition were such as to warrant the removal of the tube at 11 P.M. of the same day, the gag was applied to the mouth and the tube removed without any difficulty or special annoyance to the boy. His temperature, when I first went into the room, was 102° ; pulse and respiration were not different from the previous examination. When the boy found that the tube was to be removed he became greatly excited and alarmed, and considerable shock took place as a result. The face became immediately pale and cyanosed to a slight extent, and he told me that he was going to die. Whiskey was given hypodermically and the tube immediately removed.

Respiration was as free as before, and as soon as he

found it was removed his courage returned ; he was put into bed, and inside of a half-hour the temperature had increased 2° , making it 104.2° . This increase was not due to the effect on the lungs by the removal of the tube, but the reaction that followed from the depression at the thought of removal.

Next morning the temperature had fallen to 102° . From the removal of the tube my connection with the case ended, but yet I have kept myself informed of the boy's condition. He had marked albuminuria that gave a great deal of annoyance. The case ran gradually into marked capillary bronchitis. I am inclined to think the latter was due not to any extension of inflammation into the smaller tubes, but rather due to the condition of the lungs produced by the prevention of lung expansion previous to the intubation. And there is no doubt that if the tube had been introduced earlier this condition could have been averted and the patient had better chances of recovery. When we come to look at the condition of the lung during the time in which there was so little chest expansion, we can readily understand how capillary bronchitis could occur, for there were deficient inspiration and expiration—more markedly deficient inspiration—and as the latter condition is productive of a tendency to collapse of the lungs, and from this cause capillary bronchitis. And not only this condition but in combination with it is the weak and debilitated condition of the patient, which in itself is a frequent cause of both primary and secondary bronchitis, and, judging by the boy's physique, there was not that muscular status that would give free lung expansion. Then the presence of albuminuria, the

irritation arising from this state on the lungs, would help to aggravate an already existing condition.

The case dragged on, and died after the lapse of twenty-two days from day of attack and fifteen days after the intubation. Though the termination was not favorable, the object for which this paper was written was successful. The intubation gave the results expected; the boy was carried through the disease by this means, and, as the sequelæ developed new factors in the case, they alone were answerable for the results.

The medication of the boy when I was called to introduce the tube was hydrarg. chlor. mite., gr. $\frac{1}{2}$, every two hours, combined with a small amount of Dover's powder and tartar emetic each (the latter two ingredients were the suggestion of a physician that had been called in consultation), quinine, iron and chlorate of potash. The Dover's powder and tartar emetic were stopped and the calomel continued. Quinine was given by suppositories, about 18 grains a day; whiskey according to condition. The calomel was stopped on the 10th instant. He was then continued on stimulants, quinine and carbonate of ammonia. Digitalis was given for heart debility and to increase its tension. Anæmic stupor became marked, and active measures were called for. Pilocarpine, gr. $\frac{1}{2}$, was given hypodermically when the excretions became marked; the heart's action lessened and became weak; respiration irregular, and all indications of a rapid demise; but in time reaction set in, a marked relief was shown, the mind cleared, and diuresis was freer. From this time the case showed no peculiarities except length of time, and then gradually lapsed into death.

II

With the information gained from the report of cases and my own experience in their use, it is a query to me, if any physician should allow a patient to die without the trial of intubation, would the law justify it?

